Raquel Webster
Senior Counsel

October 24, 2016

BY HAND DELIVERY AND ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 4654 – The Narragansett Electric Company, d/b/a National Grid
2017 Energy Efficiency Program Plan Technical Reference Manual and Evaluations

Dear Ms. Massaro:

I have enclosed an electronic copy of National Grid's[1] 2017 Technical Reference Manual (TRM) and the evaluations referenced in the TRM. The Company submits these documents in support of the proposed Energy Efficiency Program Plan for 2017 (the 2017 Plan or Plan), which the Company filed with the PUC on October 17, 2016.

The 2017 TRM describes the energy efficiency measures National Grid will be implementing in 2017. The 2017 TRM builds on the work of past years, and many of the measures described in the 2017 TRM are the same as the measures described in the 2016 TRM. Note, however, that several measures have changed as a result of baseline changes or results from evaluation activities.

The attached PDF document includes a table of contents that provides page numbers for the various measure categories, with measure descriptions listed alphabetically under the category headings. National Grid continues to work on an on-line version of the TRM, so an on-line version is not yet publicly available.

Thank you for your attention to this filing. If you have any questions, please contact me at 781-907-2121.

Sincerely,

Raquel J. Webster

Enclosure: CD-ROM
cc: Jon Hagopian, Esq.
Steve Scialabba, Division

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or Company).

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Rhode Island
Technical Reference Manual

For Estimating Savings from Energy Efficiency Measures

2017 Program Year

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Introduction

This *Rhode Island Technical Reference Manual* ("TRM") documents for regulatory agencies, customers, and other stakeholders the methodologies and assumptions used by National Grid to estimate the savings, including reductions in energy and demand consumption and other resource and non-energy impacts, attributable to its electric and gas energy efficiency programs. This reference manual provides methods, formulas and default assumptions for estimating energy, peak demand and other resource and non-energy impacts from efficiency measures.

Within this TRM, efficiency measures are organized by the sector for which the measure is eligible and by the primary energy source associated with the measure. The two sectors are Residential and Commercial & Industrial ("C&I"). The primary energy sources addressed in this TRM are electricity and natural gas.

Each measure is presented in two pages as a "measure characterization." The measure characterizations provide mathematical equations for determining savings (algorithms), as well as default assumptions and sources, where applicable. In addition, any descriptions of calculation methods or baselines are provided as appropriate. The parameters for calculating savings are listed in the same order for each measure.

Algorithms are provided for estimating annual energy and peak demand impacts for primary and secondary energy sources if appropriate. In addition, algorithms or calculated results may be provided for other non-energy impacts (such as water savings or operation and maintenance cost savings). Assumptions are based on Rhode Island data where available. Where Rhode Island-specific data is not available, assumptions may be based on: 1) manufacturer and industry data, 2) a combination of the best available data from jurisdictions in the same region, or 3) engineering judgment to develop credible and realistic factors.

The TRM is reviewed and updated annually to reflect changes in technology, baselines and evaluation results.

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The TRM in the Context of Energy Efficiency Programs

Overview

The purpose of this section is to show how the TRM fits into the process of administering energy efficiency programs in Rhode Island. This section explains how the TRM is connected to the following efforts:

- Planning,
- Annual reporting,
- Updates to PA tracking systems,
- Evolution of program and measure cost effectiveness analysis tools,
- Evaluation, Measurement and Verification ("EM&V"),
- Quality control.

Planning and Reporting

National Grid is submitting this version of the RI TRM (the 2017 TRM) to the stakeholders along with its Energy Efficiency Program Plan ("EE Program Plan") for 2017.

The RI TRM provides regulators and stakeholders with documentation of the assumptions and algorithms that National Grid will use in planning and reporting its energy savings for 2017. It can also be used to support qualification in ISO-New England Forward Capacity Market Auctions. However, due to the nature of planning, not all planning assumptions – such as those for Commercial and Industrial programs – are documented in this TRM. For these areas, the algorithms used to calculate planned savings are presented.

Updates to Program Administrator Tracking Systems

National Grid maintains a tracking system that contains the energy efficiency data that it uses to meet its annual reporting to the RI PUC. The current design of the tracking system influences the types of assumptions and algorithms that appear in this TRM. The current algorithms leverage inputs that National Grid collects.

Evolution of Program and Measure Cost Effectiveness Analysis Tools

The program and measure cost effectiveness analysis tools are Microsoft® Excel® workbooks used by National Grid to ensure that the measures and programs that they implement meet the cost effectiveness requirements defined by the Rhode Island PUC in Docket 4443. National Grid also uses the output from the cost effectiveness analysis tools to develop the input (data, tables, and graphs) for its EE Program Plans and Year-End Reports. National Grid envisions aligning the measure names and the categorization of measures in the TRM with the measure names and categorization of measures in the cost effectiveness analysis tools either directly, or through the use of a translation tool.

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Evaluation, Measurement and Verification

Evaluation, Measurement and Verification ("EM&V") ensures that the programs are evaluated, measured, and verified in a way that provides confidence to the public at large that the savings are real and in a way that enables National Grid to report those savings to the EERMC and RI PUC with full confidence.

A secondary goal of creating a TRM is to identify areas where savings calculations can be improved. The TRM will inform future EM&V planning as a means to make these improvements.

For its Rhode Island programs, National Grid may use evaluation results from other jurisdictions. For some of these, Rhode Island contributed sites and/or budgets. For others, the application of results from other jurisdictions is considered based on how similar the programs, delivery, and markets are to those in Rhode Island.

Quality Control

Regulators and stakeholders can use the TRM to confirm that savings inputs and calculations are reasonable and reliable. However, the TRM cannot be used by regulators and stakeholders to replicate the Company's reported savings. The TRM does not provide regulators and stakeholders with data inputs at a level that is detailed enough to enable replication of the savings reported by PAs. These calculations occur within tracking systems, within separate Excel workbooks, and within cost effectiveness analysis tools. However, in the event that regulators and stakeholders request that PAs provide tracking system details, the reproduction of reported data will be possible using the TRM.

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TRM Update Process

Overview

This section describes the process for updating the TRM. The update process is synchronized with the filing of EE Program Plans.

Updates to the TRM can include:

- additions of new measures,
- updates to existing TRM measures due to:
  - changes in baseline equipment or practices, affecting measure savings
  - changes in efficient equipment or practices, affecting measure savings
  - changes to deemed savings due the revised assumptions for algorithm parameter values (e.g., due to new market research or evaluation studies) o other similar types of changes,
- updates to impact factors (e.g., due to new impact evaluation studies),
- discontinuance of existing TRM measures, and
- updates to the glossary and other background material included in the TRM.

Each TRM is associated with a specific program year, which corresponds to the calendar year. The TRM for each program year is updated over time as needed to both plan for future program savings and to report actual savings.

Key Stakeholders and Responsibilities

Key stakeholders and their responsibilities for the TRM updates are detailed in the following table.

Stakeholder	Responsibilities
National Grid	• Identify and perform needed updates to the TRM • Provide TRM to interested stakeholders
Rhode Island EERMC and Division of Public Utilities and Carriers	• In 2012, the EERMC commissioned the Natural Gas Opportunities Report • Review; suggest modifications; and accept TRM • Assure coordination with National Grid submissions of program plans and reported savings

Jointly	• Administrative coordination of TRM activities, including:
	  • Assure collaboration and consensus regarding TRM updates
	  • Assure updates are compiled and incorporated into the TRM
	  • Coordinate with related program activities (e.g., evaluation and program reporting processes)

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TRM Update Cycle

The description below indicates the main milestones of the TRM update cycle over a period of two years. The identifier "program year" or "PY" is used to show that this cycle will be repeated every year. For example, for the 2017 Program Year, compilation of updates begins after the 2016 TRM is completed in October 2015, and continued through September 2016, for submission in October 2016.

September PY-2 to September PY-1: The PY TRM will be updated as needed based on evaluation studies and any other updates.

After the PY-1 TRM has been filed, there may be updates to the TRM. The most common updates to the TRM will result from new evaluation studies. Results of evaluation studies will be integrated into the next version of the TRM as the studies are completed. Other updates may include the results of group discussions to adopt latest research or the addition or removal of energy efficiency measures

November (PY-1) prior to program year: The PY TRM is filed with National Grid's PY EE program plan

The PY TRM is submitted to the PUC jointly with National Grid's EE program plan. With regard to the program plans, the TRM is considered a "planning document" in that it provides the documentation for how the PAs *plan* to count savings for that program year. The TRM is not intended to fully document how the PAs develop their plan estimates for savings.

January PY: National Grid begins to track savings based on the PY TRM

Beginning in January PY, the PAs will track savings for the PY based on the PY TRM.

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Measure Characterization Structure

This section describes the common entries or inputs that make up each measure characterization. A formatted template follows the descriptions of each section of the measure characterization.

Source citations: The source of each assumption or default parameter value should be properly referenced in a footnote.

Applicability: All Measures shown within the 2017 TRM are active for the 2017 Program Year: from 1/1/2017 to 12/31/2017

Measure Description Overview

This section will include a plain text description of the efficient and baseline technology and the benefit(s) of its installation, as well as subfields of supporting information including:

Fuel: The fuel against which savings are being claimed, and the program from which EE incentives are being drawn

Sector: Indicates whether measure is Residential, Income Eligible or Commercial and Industrial

Project Type: Indicates if measure is Retrofit or New Construction / Time of Replacement

Category: Indicates the measure category, for example: Lighting, HVAC, Hot Water, Products, Food Service, Compressed Air, Motors/Drives, Refrigeration, Behavior, Custom, etc

Type and Sub-type: Further measure classification for purposes of sorting measures

Program Name: The current program name under which the measure is being delivered.

Measure Name: A single device or behavior may be analyzed as a range of measures depending on a variety of factors which largely translate to where it is and who is using it. Such factors include hours of use, location, and baseline (equipment replaced or behavior modified). For example, the same screw-in compact fluorescent lamp will produce different savings if installed in an emergency room waiting area than if installed in a bedside lamp.

Measure Description: Description of the energy efficiency measure, its benefits, and applications.

Baseline Description: Description of the assumed equipment/operation efficiency in the absence of program intervention. Multiple baselines will be provided as needed, e.g., for different markets. Baselines may refer to reference tables or may be presented as a table for more complex measures)

Savings Principle: The means by which the measure saves energy relative to the baseline. Description of the assumed or calculated equipment/operation efficiency from which the energy and demand savings are determined. The high efficiency case may be based on specific details of the measure installation, minimum requirements for inclusion in the program, or an energy efficiency case based on historical participation. It may refer to tables within the measure characterization or in the appendices or efficiency standards set by organizations such as ENERGY STAR® or the Consortium for Energy Efficiency

Savings Calculation method: How the savings values are determined; in most cases, values are either deemed or calculated

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Savings unit: required minimum unit / characteristic for claiming listed savings values

Savings

This section includes various information on the measure savings and how they are determined.

- **Summary Average Gross Savings per Unit by Program:** This table summarizes the resource savings (kWh, kW, MMBtu) of all efficiency offerings within a measure category via a weighted average of their savings. This is only for illustrating savings and does not correspond to how savings are tracked
    - **Program:** This describes the programs in which the measures are offered. Some measures are offered in multiple program

Sector and Program name mapping will be as follows:

Sector	Full Program Name
Residential – Electric	Residential New Construction
	EnergyStar® HVAC
	EnergyWise
	EnergyWise Multifamily
	EnergyStar® Lighting
	Home Energy Reports
	EnergyStar® Products
Income Eligible – Electric	Single Family Appliance Management
	Income Eligible Multifamily
Commercial & Industrial – Electric	Commercial New Construction
	Commercial Retrofit
	Direct Install
Residential – Gas	EnergyStar® Heating System
	EnergyWise
	EnergyWise Multifamily
	Home Energy Reports
	Residential New Construction
Income Eligible – Gas	Single Family Appliance Management
	Income Eligible Multifamily
Commercial & Industrial – Gas	Commercial New Construction
	Commercial Retrofit
	Direct Install
	Commercial & Industrial Multifamily

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- **Algorithm Type:** This section describes which of four methods of savings calculation applies to a measure
    - Deemed: The same savings are allocated to every unit of a measure
    - Engineering Algorithm with Deemed Inputs: Measure savings are calculated with an engineering formula, the inputs of which are constant for all units of a measure.
    - Engineering Algorithm with Site Specific Inputs: Measure savings are calculated with an engineering formula, the inputs of which depend on data from the installation site.
    - Custom: Each unit of a measure receives a unique savings calculation that depends on site specific data.
- **Units:** This section describes what is installed or affected by an efficiency measure (eg. a boiler or a participant). It defines the quantity counted for savings.
- **Algorithm:** This section will describe the method for calculating the primary energy savings in appropriate units, i.e., kWh for electric energy savings or MMBtu for natural gas energy savings. The savings algorithm will be provided in a form similar to the following

  $$\Delta kWh = \Delta kW \times Hours$$

  Similarly, the method for calculating electric demand savings will be provided in a form similar to the following:

  $$\Delta kW = \left(Watts_{BASE} - Watts_{EE}\right)/1000$$

  Below the savings algorithms, a table contains the definitions (and, in some cases, default values) of each input in the equation(s). The inputs for a particular measure may vary and will be reflected as such in this table (see example below).

ΔkWh	=	gross annual kWh savings from the measure
ΔkW	=	gross connected kW savings from the measure
Hours	=	average hours of use per year
$Watts_{BASE}$	=	baseline connected kW
$Watts_{EE}$	=	energy efficient connected kW

- **Hours**: The operating hours for equipment that is either on or off, or equivalent full load hours for technologies that operate at partial loads, or reduced hours for controls. Reference tables will be used as needed to avoid repetitive entries.
- **Measure Gross Savings per Unit:** This table summarizes the unit resource impacts of each efficiency offering within a measure category (e.g., the savings for boilers of different efficiencies and ratings in the Boiler measure category). The source for each value is referenced.
- **Non-Energy Impacts:** The non-energy impacts are shown for each efficiency measure

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under Annual and One-Time headings, depending on their recommended application approach. If the measure has no NEIs, the entry is "N/A."

Impact Factors for Calculating Adjusted Gross Savings:

This section includes a table of impact factor values for adjusting gross savings and calculating lifetime savings. Sources are referenced. Impact factors (free ridership, spillover and/or net-togross ratio) for calculating net savings from adjusted gross savings are in Appendix B.

- **Measure Life:** Measure Life includes equipment life and the effects of measure persistence. Equipment life is the number of years that a measure is installed and will operate until failure. Measure persistence takes into account business turnover, early retirement of installed equipment, and other reasons measures might be removed or discontinued**.**

Other impact factors are defined in the next section.

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Impact Factors for Calculating Adjusted Gross and Net Savings

National Grid uses the algorithms in the Measure Characterization sections to calculate the gross savings for energy efficiency measures. Impact factors are then applied to make various adjustments to the gross savings estimate to account for the performance of individual measures or energy efficiency programs as a whole in achieving energy reductions as assessed through evaluation studies. Impacts factors address both the technical performance of energy efficiency measures and programs, accounting for the measured energy and demand reductions realized compared to the gross estimated reductions, as well as the programs' effect on the market for energy efficient products and services.

This section describes the types of impact factors used to make such adjustments, and how those impacts are applied to gross savings estimates. Definitions of the impact factors and other terms are also provided in the Glossary (Appendix F).

Types of Impact Factors

The impact factors used to adjust savings fall into one of two categories:

Impact factors used to adjust gross savings:

- In-Service Rate ("ISR")
- Savings Persistence Factor ("SPF")
- Realization Rate ("RR")
- Summer and Winter Peak Demand Coincidence Factors ("CF").

Impact factors used to calculate net savings:

- Free-Ridership ("FR") and Spillover ("SO") Rates
- Net-to-Gross Ratios ("NTG").

The **in-service rate** is the actual portion of efficient units that are installed. For example, efficient lamps may have an in-service rate less than 1.00 since some lamps are purchased as replacement units and are not immediately installed. The ISR is 1.00 for most measures.

The **savings persistence factor** is the portion of first-year energy or demand savings expected to persist over the life of the energy efficiency measure. The SPF is developed by conducting surveys of installed equipment several years after installation to determine the actual operational capability of the equipment. The SPF is 1.00 for most measures.

In contrast to savings persistence, *measure persistence* takes into account business turnover, early retirement of installed equipment, and other reasons the installed equipment might be removed or discontinued. Measure persistence is generally incorporated as part of the measure life, and therefore is not included as a separate impact factor.

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The **realization rate** is used to adjust the gross savings (as calculated by the savings algorithms) based on impact evaluation studies. The realization rate is equal to the ratio of measure savings developed from an impact evaluation to the estimated measure savings derived from the savings algorithms. The realization rate does not include the effects of any other impact factors. Depending on the impact evaluation study, there may be separate realization rates for energy (kWh), peak demand (kW), or fossil fuel energy (MMBtu).

A **coincidence factor** adjusts the connected load kW savings derived from the savings algorithm. A coincidence factor represents the fraction of the connected load reduction expected to occur at the same time as a particular system peak period. The coincidence factor includes both coincidence and diversity factors combined into one number, thus there is no need for a separate diversity factor in this TRM.

Coincidence factors are provided for the on-peak period as defined by the ISO New England for the Forward Capacity Market ("FCM"), and are calculated consistently with the FCM methodology. Electric demand reduction during the ISO New England peak periods is defined as follows:

- Summer On-Peak: average demand reduction from 1:00-5:00 PM on non-holiday weekdays in June July, and August
- Winter On-Peak: average demand reduction from 5:00-7:00 PM on non-holiday weekdays in December and January

The values described as Coincidence Factors in the TRM are not always consistent with the strict definition of a Coincidence Factor (CF). It would be more accurate to define the Coincidence Factor as "the value that is multiplied by the Gross kW value to calculate the average kW reduction coincident with the on-peak periods." A coincidence factor of 1.00 may be used because the coincidence is already included in the estimate of Gross kW; this is often the case when the "Max kW Reduction" is not calculated and instead the "Gross kW" is estimated using the annual kWh reduction estimate and a loadshape model.

A **free-rider** is a customer who participates in an energy efficiency program (and gets an incentive) but who would have installed some or all of the same measure(s) on their own, with no change in timing of the installation, if the program had not been available. The **free-ridership rate** is the percentage of savings attributable to participants who would have installed the measures in the absence of program intervention.

The **spillover rate** is the percentage of savings attributable to a measure or program, but additional to the gross (tracked) savings of a program. Spillover includes the effects of 1) participants in the program who install additional energy efficient measures outside of the program as a result of participating in the program, and 2) non-participants who install or influence the installation of energy efficient measures as a result of being aware of the program. These two components are the **participant spillover** (SO_P) and **non-participant spillover** (SO_{NP}).

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The **net savings** value is the final value of savings that is attributable to a measure or program. Net savings differs from gross savings because it includes the effects of the free-ridership and/or spillover rates.

The **net-to-gross** ratio is the ratio of net savings to the gross savings adjusted by any impact factors (i.e., the "adjusted" gross savings). Depending on the evaluation study, the NTG ratio may be determined from the free-ridership and spillover rates, if available, or it may be a distinct value with no separate specification of FR and SO values.

Standard Net–to–Gross Formulas

The TRM measure entries provide algorithms or methodologies for calculating the gross energy and demand savings for each category of efficiency measures. The following standard formulas show how the impact factors are applied to calculate the net savings. These are the calculations used by National Grid to track and report gross and net savings for its energy efficiency programs in Rhode Island.

- **Calculation of Net Annual Electric Energy Savings**
  $net_kWh = gross_kWh \times SPF \times ISR \times RR_E \times NTG$

- **Calculation of Net Summer Electric Peak Demand Coincident kW Savings**
  $net_kW_{SP} = gross_kW \times SPF \times ISR \times RR_{SP} \times CF_{SP} \times NTG$

- **Calculation of Net Winter Electric Peak Demand Coincident kW Savings**
  $net_kW_{WP} = gross_kW \times SPF \times ISR \times RR_{WP} \times CF_{WP} \times NTG$

- **Calculation of Net Annual Natural Gas Energy Savings**
  $net_MMbtu = gross_MMBtu \times SPF \times ISR \times RR_E \times NTG$

Where:
Gross_kWh = Gross Annual kWh Savings
net_kWh = Net Annual kWh Savings
$Gross_kW_{SP}$ = Gross Connected kW Savings (summer peak)
$Gross_kW_{WP}$ = Gross Connected kW Savings (winter peak)
net_kW_{SP} = Adjusted Gross Connected kW Savings (winter peak)
net_kW_{WP} = Net Coincident kW Savings (winter peak)
Gross_MMBtu = Gross Annual MMBtu Savings
net_MMBtu = Net Annual MMBtu Savings
SPF = Savings Persistence Factor
ISR = In-Service Rate
CF_{SP} = Peak Coincidence Factor (summer peak)
CF_{WP} = Peak Coincidence Factor (winter peak)
RR_E = Realization Rate for electric energy (kWh)
RR_{SP} = Realization Rate for summer peak kW
RR_{WP} = Realization Rate for winter peak kW

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NTG = Net-to-Gross Ratio FR = Free-Ridership Factor SO_P = Participant Spillover Factor SO_{NP} = Non-Participant Spillover Factor

Depending on the evaluation study methodology:

- NTG is equal to ($1 – FR + SO_P + SO_{NP}$), or
- NTG is a single value with no distinction of FR, SO_P, SO_{NP}, and/or other factors that cannot be reliably isolated.

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Measure Characterizations

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TRM Reference Number	RIER001
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Clothes Dryers
Sub-type	Dryer
Program Name	EnergyStar Products
Measure Name	Heat Pump Dryer
Measure Description	The installation of a heat pump clothes dryer.
Baseline Description	A new electric dryer.
Savings Principle	A super efficient electric heat pump dryer.
Energy Savings calculation method	Deemed
Savings unit	Installed heat pump dryer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	241
kWh/yr savings source	SEDI HE Dryer Screening Ver.2 Using DOE2005.xls
kWh/yr savings note	#N/A
kW reduction	0.044
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	SEDI HE Dryer Screening Ver.2 Using DOE2005.xls
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.73
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	412.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 200 per measure

.

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TRM Reference Number	RIER002
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Clothes Dryers
Sub-type	Dryer
Program Name	EnergyStar Products
Measure Name	EnergyStar Dryer
Measure Description	The installation of an EnergyStar clothes dryer .
Baseline Description	A new electric dryer.
Savings Principle	An EnergyStar electric dryer.
Energy Savings calculation method	Deemed
Savings unit	Installed EnergyStar dryer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	160
kWh/yr savings source	Measure Screening Report ES Dryers 2017 Plan
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Measure Screening Report ES Dryers 2017 Plan
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	SEDI HE Dryer Screening Ver.2 Using DOE2005.xls
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00

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CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.10
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.90
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	60.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 50 per measure

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TRM Reference Number	RIER005
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Dehumidifiers
Sub-type	Dehumidifier
Program Name	EnergyStar Products
Measure Name	Dehumidifier
Measure Description	The Installation of high efficiency dehumidifiers and the turn-in of existing inefficienct dehumidifyers.
Baseline Description	Standard efficiency.
Savings Principle	The high efficiency case is an ENERGY STAR® replacement unit with an efficiency of 1.47 L/kWh. The high efficiency case is an ENERGY STAR® replacement unit with an efficiency of 1.47 L/kWh.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Per dehumidifer
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	239
kWh/yr savings source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kWh/yr savings note	#N/A
kW reduction	0.041
kW reduction source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.85
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.50
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.50
Net-to-Gross source	Negotiated FR Rate with EERMC Consultants July, 2015.
Net-to-Gross note	#N/A
Gross Measure TRC unit	34.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 30 per measure

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TRM Reference Number	RIER007
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Dehumidifiers
Sub-type	Dehumidifier
Program Name	EnergyStar Products
Measure Name	Dehumidifier Recycling
Measure Description	Recycling of old dehumidifiers
Baseline Description	Operating inefficient unit.
Savings Principle	Recycling of inefficient unit.
Energy Savings calculation method	Deemed
Savings unit	Per dehumidifer
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	152
kWh/yr savings source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kWh/yr savings note	#N/A
kW reduction	0.03
kW reduction source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.85

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	50.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$30 per measure

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TRM Reference Number	RIER012
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Recycling
Sub-type	Freezer Recycling
Program Name	EnergyStar Products
Measure Name	Freezer Recycling
Measure Description	The retirement of old, inefficient secondary refrigerators and freezers.
Baseline Description	The baseline efficiency case is an old, inefficient secondary working refrigerator or freezer. Estimated average usage is based on combined weight of freezer energy use and refrigerator energy use.
Savings Principle	The high efficiency case assumes no replacement of secondary unit.
Energy Savings calculation method	Deemed
Savings unit	Removal of existing refrigerator or freezer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	663
kWh/yr savings source	NMR Group, Inc. (2011). Massachusetts Appliance Turn-In Program Evaluation Integrated Report Findings – FINAL. Prepared for National Grid, NSTAR Electric, Cape Light Compact, and Western Massachusetts Electric Company.
kWh/yr savings note	#N/A
kW reduction	0.082
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	NMR Group, Inc. (2011). Massachusetts Appliance Turn-In Program Evaluation Integrated Report Findings – FINAL. Prepared for National Grid, NSTAR Electric, Cape Light Compact, and Western Massachusetts Electric Company.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.41
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.59
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 55 per measure

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TRM Reference Number	RIER014
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Recycling
Sub-type	Refrigerator Recycling
Program Name	EnergyStar Products
Measure Name	Refrigerator Recycle
Measure Description	The retirement of old, inefficient secondary refrigerators and freezers.
Baseline Description	The baseline efficiency case is an old, inefficient secondary working refrigerator or freezer. Estimated average usage is based on combined weight of freezer energy use and refrigerator energy use.
Savings Principle	The high efficiency case assumes no replacement of secondary unit.
Energy Savings calculation method	Deemed
Savings unit	Removal of existing refrigerator or freezer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	755
kWh/yr savings source	NMR Group, Inc. (2011). Massachusetts Appliance Turn-In Program Evaluation Integrated Report Findings – FINAL. Prepared for National Grid, NSTAR Electric, Cape Light Compact, and Western Massachusetts Electric Company.
kWh/yr savings note	#N/A
kW reduction	0.093
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	NMR Group, Inc. (2011). Massachusetts Appliance Turn-In Program Evaluation Integrated Report Findings – FINAL. Prepared for National Grid, NSTAR Electric, Cape Light Compact, and Western Massachusetts Electric Company.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.92
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.31
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.69
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 55 per measure

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TRM Reference Number	RIER015
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Refrigerator Recycling
Sub-type	Refrigerator Recycling
Program Name	EnergyStar Products
Measure Name	Refrigerator Recycling (Primary)
Measure Description	The retirement of old, inefficient primary refrigerators and freezers.
Baseline Description	The baseline efficiency case is an old, inefficient primary working refrigerator or freezer. Estimated average usage is based on combined weight of freezer energy use and refrigerator energy use.
Savings Principle	The high efficiency case is the replacement of the refrigerator with an Energy Star® refrigerator or a model that is ENERGY STAR® rated and included in the Most Efficient® or Top Ten USA® ranking.
Energy Savings calculation method	Deemed
Savings unit	Removal of existing refrigerator or freezer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	533
kWh/yr savings source	NMR Group, Inc. (2011). Massachusetts Appliance Turn-In Program Evaluation Integrated Report Findings – FINAL. Prepared for National Grid, NSTAR Electric, Cape Light Compact, and Western Massachusetts Electric Company.
kWh/yr savings note	#N/A
kW reduction	0.066
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.31
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.69
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER016
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Refrigerators
Sub-type	Refrigerator
Program Name	EnergyWise
Measure Name	Refrig rebate
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new efficient refrigerator.
Baseline Description	For Top Ten® and Most Efficient® refrigerators, the baseline is a 50% mix of available Energy Star® and Federal standard compliant refrigerators. For Energy Star® refrigerators, the baseline is a refrigerator that meets Federal standards.
Savings Principle	The high efficiency case is an Energy Star® refrigerator or a model that is ENERGY STAR® rated and included in the Most Efficient® or Top Ten USA® ranking.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency refrigerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	460.8
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.026
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Residential Refrigerator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	173.97
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER021
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Appliances
Type	Refrigerators
Sub-type	Refrigerator
Program Name	Residential New Construction
Measure Name	Refrigerators
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new efficient refrigerator.
Baseline Description	Existing refrigerator continues to operate.
Savings Principle	The high efficiency case is an Energy Star® refrigerator or a model that is ENERGY STAR® rated and included in the Most Efficient® or Top Ten USA® ranking.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed refrigerator
Savings Equation	Gross kWh = Qty × (kWh_base - kWh_ee) Gross kW = Qty × deltakW Where: Qty = Total number of units. kWh_base = Deemed average demand per baseline unit. kWh_ee = Deemed average demand per high-efficiency unit. DeltakW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.013
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.92
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIER024
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	CoolSmart AC SEER 16.0 EER 13
Measure Description	The purchase and installation of high efficiency central air-conditioning (CAC) unit rather than a standard CAC system, and/or to replace an existing inefficient CAC system.
Baseline Description	The baseline efficiency case is a blend of code-compliant central air-conditioning system with SEER = 13 and EER = 11. For early replacement installations, the baseline is a 10-12 year old HVAC unit with SEER = 10 and EER = 8.5.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified Central AC system.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency central AC system for cooling.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	211
kWh/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
kWh/yr savings note	#N/A
kW reduction	0.586
kW reduction source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	16
measure life source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Massachusetts Common Assumption
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Massachusetts Common Assumption
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.28
Spill-Over (non-participant)	0.00
Net-to-Gross	0.86
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1061.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 250 per measure

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TRM Reference Number	RIER027
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	Down Size 1/2 ton
Measure Description	Reduction in system size consistent with manual J calculations.
Baseline Description	The baseline efficiency case is a system that is not sized in accordance with a manual J calculation.
Savings Principle	The high efficiency case is a system that is sized in accordance with a manual J calculation.
Energy Savings calculation method	Deemed
Savings unit	Completed job (assume downsize 1/2 ton).
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	203
kWh/yr savings source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kWh/yr savings note	#N/A
kW reduction	0.295
kW reduction source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	120.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIER030
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	CoolSmart AC SEER 18.0 EER 13
Measure Description	The purchase and installation of high efficiency central air-conditioning (CAC) unit rather than a standard CAC system, and/or to replace an existing inefficient CAC system.
Baseline Description	The baseline efficiency case is a blend of code-compliant central air-conditioning system with SEER = 13 and EER = 11. For early replacement installations, the baseline is a 10-12 year old HVAC unit with SEER = 10 and EER = 8.5.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified Central AC system.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency central AC system for cooling.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	344.5
kWh/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
kWh/yr savings note	#N/A
kW reduction	0.957
kW reduction source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	16
measure life source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Massachusetts Common Assumption
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Massachusetts Common Assumption
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.28
Spill-Over (non-participant)	0.00
Net-to-Gross	0.86
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1808.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIER033
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Air Source
Program Name	EnergyStar HVAC
Measure Name	Heat Pump SEER 16.0 EER 12 HSPF 8.5
Measure Description	The purchase and installation of high efficiency residential heat pump system rather than a standard HVAC system, or to replace an existing inefficient HVAC system.
Baseline Description	The baseline efficiency case is a residential heat pump with EER = 11.85, SEER = 14 and HSPF = 8.2. For early replacement installations, the baseline is a 10-12 year old HVAC unit with SEER = 10, EER = 8.5 and HSPF = 7.0.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified air-source heat pump.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiecny air-source heat pump system for heating.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × [(1/SEER_base - 1/SEER_ee) × Hours_C + (1/HSPF_base - 1/HSPF_ee) × Hours_H] Gross kW = Tons × (kBtu/hr per ton) × max[(1/SEER_base - 1/SEER_ee),(1/HSPF_base - 1/HSPF_ee)] Where: Tons = Deemed average equipment capacity: 2.5 tons for 16 SEER unit / 2.8 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours HSPF_base = Heating efficiency of baseline equipment. HSPF_ee = Heating efficiency of new equipment. Hours_H = Deemed average equivalent full load heating hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	618.9
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.371
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.23
CF summer peak source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.53
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.35
Spill-Over (participant)	0.28
Spill-Over (non-participant)	0.00
Net-to-Gross	0.93
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	549.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 250 per measure

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TRM Reference Number	RIER043
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Ductless
Program Name	EnergyStar HVAC
Measure Name	Mini Split HP SEER 18.0 HSPF 9
Measure Description	The installation of a more efficient ENERGY STAR® rated Ductless MiniSplit system.
Baseline Description	The baseline efficiency case is a non- ENERGY STAR® rated ductless mini split heat pump with SEER 14, EER 8.5 and HSPF 8.2.
Savings Principle	The high efficiency case is a high-efficiency Ductless Mini Split System.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency ductless minisplit system.
Savings Equation	Gross kWh = Tons × (12 kBtu/hr per ton) × [(1/SEER_base - 1/SEER_EE) × Hours_c + (1/HSPF_base - 1/HSPF_EE) × Hours_h)] Gross kW = Tons × (12 kBtu/hr per ton) × max[(1/SEER_base - 1/SEER_ee),(1/HSPF_base - 1/HSPF_ee)] Where: Tons = Deemed average equipment capacity: 1.8 tons for 18 SEER unit / 1.1 tons for 20 SEER unit SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment SEER_ee = Seasonal Energy Efficiency Ratio of new equipment HSPF_base = Heating Season Performance Factor of baseline equipment HSPF_ee = Heating Season Performance Factor of new equipment Hours_c = Equivalent full load cooling hours Hours_h = Equivalent full load heating hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	307
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.496
kW reduction source	#N/A
kW reduction note	Calculated. Tonnage used in calculations is 1.25, as provided by Conservation Services Group
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.45
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	700.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 250 per measure

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TRM Reference Number	RIER049
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Air Source
Program Name	EnergyStar HVAC
Measure Name	Heat Pump SEER 18.0 HSPF 9.6
Measure Description	The purchase and installation of high efficiency residential heat pump system rather than a standard HVAC system, or to replace an existing inefficient HVAC system.
Baseline Description	The baseline efficiency case is a residential heat pump with EER = 11.85, SEER = 14 and HSPF = 8.2. For early replacement installations, the baseline is a 10-12 year old HVAC unit with SEER = 10, EER = 8.5 and HSPF = 7.0.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified air-source heat pump.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiecny air-source heat pump system for heating.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × [(1/SEER_base - 1/SEER_ee) × Hours_C + (1/HSPF_base - 1/HSPF_ee) × Hours_H] Gross kW = Tons × (kBtu/hr per ton) × max[(1/SEER_base - 1/SEER_ee),(1/HSPF_base - 1/HSPF_ee)] Where: Tons = Deemed average equipment capacity: 2.5 tons for 16 SEER unit / 2.8 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours HSPF_base = Heating efficiency of baseline equipment. HSPF_ee = Heating efficiency of new equipment. Hours_H = Deemed average equivalent full load heating hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	1372.9
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.882
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.23
CF summer peak source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.53
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.35
Spill-Over (participant)	0.28
Spill-Over (non-participant)	0.00
Net-to-Gross	0.93
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1926.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIER050
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Ductless
Program Name	EnergyStar HVAC
Measure Name	MiniSplit HP SEER 20, HSPF 11
Measure Description	The installation of a more efficient ENERGY STAR® rated Ductless MiniSplit system.
Baseline Description	The baseline efficiency case is a non- ENERGY STAR® rated ductless mini split heat pump with SEER 14, EER 8.5 and HSPF 8.2.
Savings Principle	The high efficiency case is a high-efficiency Ductless Mini Split System.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency ductless minisplit system.
Savings Equation	Gross kWh = Tons × (12 kBtu/hr per ton) × [(1/SEER_base - 1/SEER_EE) × Hours_c + (1/HSPF_base - 1/HSPF_EE) × Hours_h)] Gross kW = Tons × (12 kBtu/hr per ton) × max[(1/SEER_base - 1/SEER_ee),(1/HSPF_base - 1/HSPF_ee)] Where: Tons = Deemed average equipment capacity: 1.8 tons for 18 SEER unit / 1.1 tons for 20 SEER unit SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment SEER_ee = Seasonal Energy Efficiency Ratio of new equipment HSPF_base = Heating Season Performance Factor of baseline equipment HSPF_ee = Heating Season Performance Factor of new equipment Hours_c = Equivalent full load cooling hours Hours_h = Equivalent full load heating hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	317
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.528
kW reduction source	#N/A
kW reduction note	Calculated. Tonnage used in calculations is 1.25, as provided by Conservation Services Group
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.45
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	700.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIER051
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	HVAC O&M
Sub-type	Central AC Quality Install
Program Name	EnergyStar HVAC
Measure Name	CoolSmart AC QIV ES
Measure Description	The verification of proper charge and airflow during installation of new Central AC system.
Baseline Description	The baseline efficiency case is a cooling system with SEER = 14.5 and EER = 12 not installed according to manufacturer specifications.
Savings Principle	The high efficiency case is the same cooling system installed according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed QIV on new AC system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × 1/SEER × Hours_C × %SAVE Gross kW = Tons × (kBtu/hr per ton) × 1/EER × %SAVE Where: Tons = Deemed average equipment capacity: 2.7 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment Hours_C = Deemed average equivalent full load cooling hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	35
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.12
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.16
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 175 per measure

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TRM Reference Number	RIER052
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	HVAC O&M
Sub-type	Central AC Quality Install
Program Name	EnergyStar HVAC
Measure Name	CoolSmart AC QIV NES
Measure Description	The verification of proper charge and airflow during installation of new Central AC system.
Baseline Description	The baseline efficiency case is a cooling system with SEER = 14.5 and EER = 12 not installed according to manufacturer specifications.
Savings Principle	The high efficiency case is the same cooling system installed according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed QIV on new AC system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × 1/SEER × Hours_C × %SAVE Gross kW = Tons × (kBtu/hr per ton) × 1/EER × %SAVE Where: Tons = Deemed average equipment capacity: 2.7 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment Hours_C = Deemed average equivalent full load cooling hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	35
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.12
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.16
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	642.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 150 per measure

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TRM Reference Number	RIER055
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	HVAC O&M
Sub-type	Heat Pump Quality Install
Program Name	EnergyStar HVAC
Measure Name	CoolSmart HP QIV ES
Measure Description	The verification of proper charge and airflow during installation of new Heat Pump systems.
Baseline Description	The baseline efficiency case is a heating and cooling system with SEER = 14.5, EER = 12 and HSPF = 8.2) not installed according to manufacturer specifications.
Savings Principle	The high efficiency case is the same heating and cooling system not installed according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed QIV on new heat pump system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER × Hours_C + 1/HSPF × Hours_H) × %SAVE Gross kW = Tons × (kBtu/hr per ton) × max[(1/EER),(1/HSPF)] × %SAVE Where: Tons = Deemed average equipment capacity: 2.6 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment HSPF = Heating efficiency of existing equipment Hours_C = Deemed average equivalent full load cooling hours Hours_H = Deemed average equivalent full load heating hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	244
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.175
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.26
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.16
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 175 per measure

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TRM Reference Number	RIER056
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	HVAC O&M
Sub-type	Heat Pump Quality Install
Program Name	EnergyStar HVAC
Measure Name	CoolSmart HP QIV NES
Measure Description	The verification of proper charge and airflow during installation of new Heat Pump systems.
Baseline Description	The baseline efficiency case is a heating and cooling system with SEER = 14.5, EER = 12 and HSPF = 8.2) not installed according to manufacturer specifications.
Savings Principle	The high efficiency case is the same heating and cooling system not installed according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed QIV on new heat pump system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER × Hours_C + 1/HSPF × Hours_H) × %SAVE Gross kW = Tons × (kBtu/hr per ton) × max[(1/EER),(1/HSPF)] × %SAVE Where: Tons = Deemed average equipment capacity: 2.6 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment HSPF = Heating efficiency of existing equipment Hours_C = Deemed average equivalent full load cooling hours Hours_H = Deemed average equivalent full load heating hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	244
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.175
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.26
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.16
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 175 per measure

.

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TRM Reference Number	RIER057
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	HVAC O&M
Sub-type	Central AC Quality Install
Program Name	EnergyStar HVAC
Measure Name	Mini Split Heat Pump QIV
Measure Description	The verification of proper charge and airflow during installation of new Central AC system.
Baseline Description	The baseline efficiency case is a cooling system with SEER = 14.5 and EER = 12 not installed according to manufacturer specifications.
Savings Principle	The high efficiency case is the same cooling system installed according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed QIV on new AC system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × 1/SEER × Hours_C × %SAVE Gross kW = Tons × (kBtu/hr per ton) × 1/EER × %SAVE Where: Tons = Deemed average equipment capacity: 2.7 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment Hours_C = Deemed average equivalent full load cooling hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	41
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.074
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	$ -
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	0.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 175 per measure

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TRM Reference Number	RIER058
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Motors
Sub-type	ECM Motor
Program Name	EnergyStar HVAC
Measure Name	Furnace ECM
Measure Description	Installation of high efficiency motors on residential furnace fans, including electronically commutated motors (ECMs) or steady state brushless furnace fan motors.
Baseline Description	The baseline efficiency case is the installation of a furnace with a standard efficiency steady state motor.
Savings Principle	The high efficiency case is the installation an electronically commutated motor or brushless fan motor on a residential furnace.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency furnace fan motor.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	168
kWh/yr savings source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.124
kW reduction source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	7.22
Oil MMBtu/yr savings source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Sachs, Harvey (2003). Energy Savings from Efficient Furnace Air Handlers in Massachusetts.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIER060
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Motors
Sub-type	ECM Motor
Program Name	EnergyStar HVAC
Measure Name	ECM Gas Rebate
Measure Description	Installation of high efficiency motors on residential furnace fans, including electronically commutated motors (ECMs) or steady state brushless furnace fan motors.
Baseline Description	The baseline efficiency case is the installation of a furnace with a standard efficiency steady state motor.
Savings Principle	The high efficiency case is the installation an electronically commutated motor or brushless fan motor on a residential furnace.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency furnace fan motor.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	168
kWh/yr savings source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.124
kW reduction source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.72
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Sachs, Harvey (2003). Energy Savings from Efficient Furnace Air Handlers in Massachusetts.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIER064
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	Residential New Construction
Measure Name	LEDs
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	985.5
Hours Source	Nexus Market Research, RLW Analytics and GDS Associates (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
Hours source note	#N/A
kWh/yr Savings	30.59
kWh/yr savings source	NMR Group (2012). Baseline Sensitivity Analysis Spreadsheet, Three-Year Planning Version. Prepared for the Massachusetts PAs.
kWh/yr savings note	#N/A
kW reduction	0.031
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.20
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.80
Net-to-Gross source	NMR Group (2012). Rhode Island 2011 Basline Study of Single-Family Residential New Construction. Prepared for national Grid.
Net-to-Gross note	#N/A
Gross Measure TRC unit	14.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 14 Per bulb

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TRM Reference Number	RIER082
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Plug Load
Type	Room Air Cleaners
Sub-type	Room Air Cleaner
Program Name	EnergyStar Products
Measure Name	Room air cleaners
Measure Description	Rebates provided for the purchase of an ENERGY STAR® qualified room air cleaner. ENERGY STAR® air cleaners are 40% more energy-efficient than standard models.
Baseline Description	The baseline efficiency case is a conventional unit with clean air delivery rate (CADR) of 51-100.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified air cleaner with a CADR of 51-100.
Energy Savings calculation method	Deemed
Savings unit	Rebated ENERGY STAR® room air cleaner
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5840
Hours Source	Environmental Protection Agency (2012), Savings Calculator for Energy Star Qualified Appliances
Hours source note	#N/A
kWh/yr Savings	391
kWh/yr savings source	Environmental Protection Agency (2012), Savings Calculator for Energy Star Qualified Appliances.
kWh/yr savings note	#N/A
kW reduction	0.084
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	Environmental Protection Agency (2012), Savings Calculator for Energy Star Qualified Appliances.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.75
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	72.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 40 per measure

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TRM Reference Number	RIER083
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Residential New Construction
Measure Name	Showerheads
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	129
kWh/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	0.022
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	10.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 10 per measure

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TRM Reference Number	RIER084
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Heat Pump Water Heater
Program Name	EnergyStar HVAC
Measure Name	HPWH 50 gallon (electric)
Measure Description	Installation of a heat pump water heater (HPWH) instead of an electric resistance water heater.
Baseline Description	The baseline efficiency case is a new, standard efficiency electric resistance hot water heater.
Savings Principle	The high efficiency case is a high efficiency heat pump water heater.
Energy Savings calculation method	Deemed
Savings unit	Installed heat pump water heater.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1654
kWh/yr savings source	Steven Winter Associates, Inc (2012). Heat Pump Water Heaters Evaluation of Field Installed Performance. Sponsored by National Grid and NSTAR.
kWh/yr savings note	#N/A
kW reduction	0.34
kW reduction source	Steven Winter Associates, Inc (2012). Heat Pump Water Heaters Evaluation of Field Installed Performance. Sponsored by National Grid and NSTAR.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	#N/A
measure life note	Based on warranty of equipment
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.47
CF summer peak source	Steven Winter Associates, Inc (2012). Heat Pump Water Heaters Evaluation of Field Installed Performance. Sponsored by National Grid and NSTAR.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	750.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIER088
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Clothes Washer
Sub-type	Clothes Washer
Program Name	Residential New Construction
Measure Name	CWASHER
Measure Description	The installation of an Energy Star clotheswasher in a Residential New Construction home.
Baseline Description	A standard non-Energy Star clotheswasher.
Savings Principle	An Energy Star clotheswasher uses less electricity and water to clean clothes.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	47.52
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.89

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CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER089
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Codes and Standards
Sub-type	Codes and Standards
Program Name	Residential New Construction
Measure Name	CODES AND STANDARDS
Measure Description	Energy efficiency code trainings and advocacy work to improve energy efficiency of buildings and equipment within Rhode Island.
Baseline Description	Un-influenced adoption curve of federal minimum codes and standards.
Savings Principle	Accelerated adoption of advancing energy codes and equipment standards.
Energy Savings calculation method	Calculated based on attribution study
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group (2012). Rhode Island 2011 Basline Study of Single-Family Residential New Construction. Prepared for national Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	NMR Group (2012). Rhode Island 2011 Basline Study of Single-Family Residential New Construction. Prepared for national Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24

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CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER090
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Cooling
Sub-type	COOLINGCP
Program Name	Residential New Construction
Measure Name	COOLINGCP
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER091
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot WaterCP
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER092
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Renovation Rehab CoolingCP
Measure Description	The cooling savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER093
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab HeatingCP
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER094
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Renovation Rehab Cooling_tier1
Measure Description	The cooling savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Synapse (2012). A Preliminary Analysis of Energy Impacts from Partial Deep Energy Retrofit Projects in National Grid's Jurisdiction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER095
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Renovation Rehab Cooling_tier2
Measure Description	The cooling savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Synapse (2012). A Preliminary Analysis of Energy Impacts from Partial Deep Energy Retrofit Projects in National Grid's Jurisdiction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER096
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Renovation Rehab Cooling_tier3
Measure Description	The cooling savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Synapse (2012). A Preliminary Analysis of Energy Impacts from Partial Deep Energy Retrofit Projects in National Grid's Jurisdiction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER097
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier1
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER098
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier2
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER099
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier3
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER100
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier1
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group, Inc. (2012) Memo to HEHE Program Administrators Re: Impacts of Upcoming Federal Standards on HEHE.Gas Space and Water Heating Measures; June 8, 2012.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER101
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier2
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group, Inc. (2012) Memo to HEHE Program Administrators Re: Impacts of Upcoming Federal Standards on HEHE.Gas Space and Water Heating Measures; June 8, 2012.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER102
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier3
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group, Inc. (2012) Memo to HEHE Program Administrators Re: Impacts of Upcoming Federal Standards on HEHE.Gas Space and Water Heating Measures; June 8, 2012.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Common measure life for insulation measures.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER103
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Cooling_tier1
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER104
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Cooling_tier2
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER105
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Cooling
Program Name	Residential New Construction
Measure Name	Cooling_tier3
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER106
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	DHW_tier1
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER107
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	DHW_tier2
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER108
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	DHW_tier3
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER109
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Heating_tier1
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIER110
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Heating_tier2
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER111
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Heating_tier3
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.

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Coincidence factor (CF) winter peak	0.89
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIER112
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Dishwasher
Sub-type	Dishwasher
Program Name	Residential New Construction
Measure Name	DISHWASH
Measure Description	The installation of an Energy Star Dishwasher in a Residential New Construction home.
Baseline Description	A standard non-Energy Star Dishwasher.
Savings Principle	An Energy Star dishwasher uses less electricity and water to clean dishes.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	40
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.0048
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90

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CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER113
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Flow Control
Sub-type	Water Heater
Program Name	Residential New Construction
Measure Name	DHWCP
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER114
Fuel	Electric
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Heating
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	HEATINGCP
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed ESH heating, cooling, or DHW project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.24
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.89

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	189.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER116
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Controls
Sub-type	Thermostat
Program Name	Single Family Appliance Management
Measure Name	Programmable Thermostat, Gas
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	3.1
Gas Heat MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Program Administrators of Massachusetts.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	44.68
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	34.47
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER117
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Controls
Sub-type	Thermostat
Program Name	Single Family Appliance Management
Measure Name	Programmable Thermostat, Oil
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	3.1
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Program Administrators of Massachusetts.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	50.21
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	34.47
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER118
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Controls
Sub-type	Thermostat
Program Name	Single Family Appliance Management
Measure Name	Programmable Thermostat, Other
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	3.1
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	44.53
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	34.47
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER119
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Dehumidifiers
Sub-type	Dehumidifier
Program Name	Single Family Appliance Management
Measure Name	Dehumidifier Rebate
Measure Description	The Installation of high efficiency dehumidifiers and the turn-in of existing inefficienct dehumidifyers.
Baseline Description	Standard efficiency.
Savings Principle	The high efficiency case is an ENERGY STAR® replacement unit with an efficiency of 1.47 L/kWh. The high efficiency case is an ENERGY STAR® replacement unit with an efficiency of 1.47 L/kWh.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Per dehumidifer
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	239
kWh/yr savings source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kWh/yr savings note	#N/A
kW reduction	0.041
kW reduction source	Dehumidifier Savings 2015-9-22 for 2017 Plan
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.85
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	3.22
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.39
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER121
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Freezers
Sub-type	Freezer
Program Name	Single Family Appliance Management
Measure Name	Replacement Freezer
Measure Description	This measure covers the replacement of an existing inefficient freezer with a new energy efficient model.
Baseline Description	The baseline efficiency case for both the replaced and baseline new freezer is represented by the existing freezer. It is assumed that low-income customers would replace their freezers with a used inefficient unit.
Savings Principle	The high efficiency case is a new high efficiency freezer.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency freezer.
Savings Equation	Gross kWh = Qty × (kWh_base - kWh_ee) Gross kW = Qty × (kWh_base - kWh_ee) / Hours Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	484
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.06
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	19
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	7.92
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	203.98
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	600.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 600 per measure

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TRM Reference Number	RIER122
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Heat Pump Water Heaters
Sub-type	Heat Pump Water Heaters
Program Name	Single Family Appliance Management
Measure Name	HP Water Heaters
Measure Description	Installation of a heat pump water heater (HPWH) instead of an electric resistance water heater.
Baseline Description	The baseline efficiency case is a new, standard efficiency electric resistance hot water heater.
Savings Principle	The high efficiency case is a high efficiency heat pump water heater.
Energy Savings calculation method	Deemed
Savings unit	Per Water Heater
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1654
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.34
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.47
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	28.35
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	46.92
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER123
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Recycling
Sub-type	Refrigerator Recycling
Program Name	Single Family Appliance Management
Measure Name	Appliance Removal
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new efficient refrigerator.
Baseline Description	For Top Ten® and Most Efficient® refrigerators, the baseline is a 50% mix of available Energy Star® and Federal standard compliant refrigerators. For Energy Star® refrigerators, the baseline is a refrigerator that meets Federal standards.
Savings Principle	The high efficiency case is an Energy Star® refrigerator or a model that is ENERGY STAR® rated and included in the Most Efficient® or Top Ten USA® ranking.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency refrigerator.
Savings Equation	Gross kWh = Qty × (kWh_base - kWh_ee) Gross kW = Qty × deltakW Where: Qty = Total number of units. kWh_base = Deemed average demand per baseline unit. kWh_ee = Deemed average demand per high-efficiency unit. DeltakW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1180
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.15
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	15.89
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	184.33
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	55.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 55 per measure

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TRM Reference Number	RIER124
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Refrigerators
Sub-type	Refrigerator
Program Name	Income Eligible MultiFamily
Measure Name	Refrigerator
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new ENERGY STAR® rated refrigerator. ENERGY STAR® qualified refrigerators use at least 20% less energy than non-qualified models.
Baseline Description	The baseline efficiency case is the existing refrigerator. It is assumed that low-income customers would otherwise replace their refrigerators with a used inefficient unit.
Savings Principle	The high efficiency case is an ENERGY STAR® rated refrigerator that meets the ENERGY STAR® criteria for full-sized refrigerators (7.75 cubic feet), using at least 20% less energy than models meeting the minimum Federal government standard.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency refrigerator.
Savings Equation	delta kWh = ((kWhpre-kWhes) x (RUL/EUL)) + (((kWhstd+kWhused)/2 - kWhes) x ((EUL-RUL)/EUL)) x Focc Where: kWhpre = Annual kWh consumption of existing equipment. Value is based on metering or AHAM database. The default value is 874 kWh. kWhES = Annual kWh consumption of new ENERGY STAR qualified refrigerator or freezer. This is from the nameplate on the new unit. The default value is 358 kWh. STD Average annual consumption of equipment meeting federal standard: Calculated by dividing the kWhES by 0.9 (i.e., the Energy Star units are assumed to be 10% more efficient than the kWhstd units). The default value is 398 kWh. kWhused Average annual consumption of used equipment. Default value is 475 kWh. RUL = Remaining Useful life assumed to be 6 years EUL = Estimated useful life for a new refrigerator is 12 years Focc = Occupant adjustment factor used to adjust the energy savings according to the number of occupants in the dwelling unit. See table below. Default is 2.3 occupants per tenant unit ΔkWh = 330, using the default assumptions
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0

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measure life	12
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Residential Refrigerator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.86
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	2.76
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.06
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	398.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 380/audit with multiple installed measures

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TRM Reference Number	RIER125
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Refrigerators
Sub-type	Refrigerator
Program Name	EnergyWise MultiFamily
Measure Name	Refrig rebate
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new ENERGY STAR® rated refrigerator. ENERGY STAR® qualified refrigerators use at least 20% less energy than non-qualified models.
Baseline Description	The baseline efficiency case is the existing refrigerator. It is assumed that low-income customers would otherwise replace their refrigerators with a used inefficient unit.
Savings Principle	The high efficiency case is an ENERGY STAR® rated refrigerator that meets the ENERGY STAR® criteria for full-sized refrigerators (7.75 cubic feet), using at least 20% less energy than models meeting the minimum Federal government standard.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency refrigerator.
Savings Equation	delta kWh = ((kWhpre-kWhes) x (RUL/EUL)) + (((kWhstd+kWhused)/2 - kWhes) x ((EUL-RUL)/EUL)) x Focc Where: kWhpre = Annual kWh consumption of existing equipment. Value is based on metering or AHAM database. The default value is 874 kWh. kWhES = Annual kWh consumption of new ENERGY STAR qualified refrigerator or freezer. This is from the nameplate on the new unit. The default value is 358 kWh. STD Average annual consumption of equipment meeting federal standard: Calculated by dividing the kWhES by 0.9 (i.e., the Energy Star units are assumed to be 10% more efficient than the kWhstd units). The default value is 398 kWh. kWhused Average annual consumption of used equipment. Default value is 475 kWh. RUL = Remaining Useful life assumed to be 6 years EUL = Estimated useful life for a new refrigerator is 12 years Focc = Occupant adjustment factor used to adjust the energy savings according to the number of occupants in the dwelling unit. See table below. Default is 2.3 occupants per tenant unit ΔkWh = 330, using the default assumptions
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0

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measure life	12
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Residential Refrigerator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.86
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	1.44
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	305.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 296/audit with multiple installed measures

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TRM Reference Number	RIER126
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Appliances
Type	Refrigerators
Sub-type	Refrigerator
Program Name	Single Family Appliance Management
Measure Name	Replacement Refrigerator
Measure Description	This measure covers the replacement of an existing inefficient refrigerator with a new ENERGY STAR® rated refrigerator. ENERGY STAR® qualified refrigerators use at least 20% less energy than non-qualified models.
Baseline Description	The baseline efficiency case is the existing refrigerator. It is assumed that low-income customers would otherwise replace their refrigerators with a used inefficient unit.
Savings Principle	The high efficiency case is an ENERGY STAR® rated refrigerator that meets the ENERGY STAR® criteria for full-sized refrigerators (7.75 cubic feet), using at least 20% less energy than models meeting the minimum Federal government standard.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed high-efficiency refrigerator.
Savings Equation	Gross kWh = Qty × (kWh_base - kWh_ee) Gross kW = Qty × (kWh_base - kWh_ee) / Hours Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	384
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.05
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	19
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	6.57
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	202.98
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	1200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1200 per measure

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TRM Reference Number	RIER130
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	EnergyWise
Measure Name	Air Sealing Kit (Oil)
Measure Description	The installation of recessed lighting cans that provide air sealing benefits.
Baseline Description	The baseline is leaky recessed lighting cans on thermal boundaries.
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST).
Energy Savings calculation method	Deemed
Savings unit	Installed kit
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	Rise Engineering (2015). Memo on Pilot Findings for LED inserts for Recessed Light Cans.
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	Rise Engineering (2015). Memo on Pilot Findings for LED inserts for Recessed Light Cans.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	2.84
Oil MMBtu/yr savings source	Rise Engineering (2015). Memo on Pilot Findings for LED inserts for Recessed Light Cans.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Rise Engineering (2015). Memo on Pilot Findings for LED inserts for Recessed Light Cans.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.20
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.80
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	14.11
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	68.74
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER131
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Oil
Program Name	EnergyWise MultiFamily
Measure Name	AIR SEALING OIL
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM Gross kW = Gross kWh × kW/kWh Where: Stories = Total stories in the multi-family building SQFT = Area of building in square feet CFM/SQFT_pre = Estimate of pre-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the existing roof and floor CFM/SQFT_post = Estimate of post-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the improved roof and floor deltakWh/CFM = Average annual kWh reduction per CFM Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	3.02
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	135.83
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER133
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Electric with AC
Program Name	EnergyWise MultiFamily
Measure Name	AIR SEALING ELEC WITH AC
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM Gross kW = Gross kWh × kW/kWh Where: Stories = Total stories in the multi-family building SQFT = Area of building in square feet CFM/SQFT_pre = Estimate of pre-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the existing roof and floor CFM/SQFT_post = Estimate of post-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the improved roof and floor deltakWh/CFM = Average annual kWh reduction per CFM Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	135.83
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER134
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Oil
Program Name	Income Eligible MultiFamily
Measure Name	AIR SEALING OIL
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM Gross kW = Gross kWh × kW/kWh Where: Stories = Total stories in the multi-family building SQFT = Area of building in square feet CFM/SQFT_pre = Estimate of pre-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the existing roof and floor CFM/SQFT_post = Estimate of post-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the improved roof and floor deltakWh/CFM = Average annual kWh reduction per CFM Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	3.02
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	79.28
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.20
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER136
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Electric with AC
Program Name	Income Eligible MultiFamily
Measure Name	AIR SEALING ELEC WITH AC
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM Gross kW = Gross kWh × kW/kWh Where: Stories = Total stories in the multi-family building SQFT = Area of building in square feet CFM/SQFT_pre = Estimate of pre-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the existing roof and floor CFM/SQFT_post = Estimate of post-retrofit air leakage in CFM/SQFT based on number of stories in the building and air-tightness ratings of the improved roof and floor deltakWh/CFM = Average annual kWh reduction per CFM Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	64.28
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.02
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER145
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	EnergyWise
Measure Name	Wx - GAS- Non Elec
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Deemed
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	72.4
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.081
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER146
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	EnergyWise
Measure Name	Wx - OIL- Non Elec
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Deemed
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	96.9
kWh/yr savings source	The Cadmus Group, Inc (2012). Rhode Island EnergyWise Single Family Impact Evaluation.
kWh/yr savings note	#N/A
kW reduction	0.179
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	14
Oil MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	109.92
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	513.88
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	2631.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1117 / participant

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TRM Reference Number	RIER147
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	EnergyWise
Measure Name	Wx-Electric - Elec
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Deemed
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	782.2
kWh/yr savings source	The Cadmus Group, Inc (2012). Rhode Island EnergyWise Single Family Impact Evaluation.
kWh/yr savings note	#N/A
kW reduction	0.83
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	66.59
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	513.88
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	2298.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1657 / participant

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TRM Reference Number	RIER150
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Oil
Program Name	EnergyWise MultiFamily
Measure Name	INSULATION OIL
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = SQFT × deltakWh/SQFT × (1/R_pre - 1/R_post) Gross kW = Gross kWh × kW/kWh Where: SQFT = Square feet of insulation installed deltakWh/SQFT = Average annual kWh reduction per SQFT of insulation R_pre = R-Value of the existing insulation R_post = R-Value of the new installed insulation Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average annual kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	7.17
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	378.05
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER152
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Electric with AC
Program Name	EnergyWise MultiFamily
Measure Name	INSULATION ELEC WITH AC
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = SQFT × deltakWh/SQFT × (1/R_pre - 1/R_post) Gross kW = Gross kWh × kW/kWh Where: SQFT = Square feet of insulation installed deltakWh/SQFT = Average annual kWh reduction per SQFT of insulation R_pre = R-Value of the existing insulation R_post = R-Value of the new installed insulation Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average annual kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	378.05
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER153
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Oil
Program Name	Income Eligible MultiFamily
Measure Name	INSULATION OIL
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = SQFT × deltakWh/SQFT × (1/R_pre - 1/R_post) Gross kW = Gross kWh × kW/kWh Where: SQFT = Square feet of insulation installed deltakWh/SQFT = Average annual kWh reduction per SQFT of insulation R_pre = R-Value of the existing insulation R_post = R-Value of the new installed insulation Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average annual kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	7.17
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	85.78
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER155
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Electric with AC
Program Name	Income Eligible MultiFamily
Measure Name	INSULATION ELEC WITH AC
Measure Description	Shell insulation upgrades applied in existing facilities including improved insulation in attics, basements and sidewalls.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = SQFT × deltakWh/SQFT × (1/R_pre - 1/R_post) Gross kW = Gross kWh × kW/kWh Where: SQFT = Square feet of insulation installed deltakWh/SQFT = Average annual kWh reduction per SQFT of insulation R_pre = R-Value of the existing insulation R_post = R-Value of the new installed insulation Gross kWh = Stories × SQFT × (CFM/SQFT_pre - CFM/SQFT_post) × deltakWh/CFM kW/kWh = Average annual kW reduction per kWh reduction
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	54.25
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.33
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER156
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation & Air sealing
Sub-type	Weatherization
Program Name	Single Family Appliance Management
Measure Name	Weatherization (electric)
Measure Description	Installation of weatherization measures such as air sealing and insulation in homes heated with electricity, oil, or propane. Non-heating electric savings are achieved from reduced fan run time for heating and cooling systems.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Deemed
Savings unit	Completed weatherization project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1616
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.86
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	579.97
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	372.33
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	4500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4500 per job

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TRM Reference Number	RIER157
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation & Air sealing
Sub-type	Weatherization
Program Name	Single Family Appliance Management
Measure Name	Weatherization (oil)
Measure Description	Installation of weatherization measures such as air sealing and insulation in homes heated with electricity, oil, or propane. Non-heating electric savings are achieved from reduced fan run time for heating and cooling systems.
Baseline Description	The baseline efficiency case is any existing home shell measures.
Savings Principle	The high efficiency case includes increased weatherization insulation levels.
Energy Savings calculation method	Deemed
Savings unit	Completed weatherization project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	377
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.2
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	28.1
Oil MMBtu/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	614.70
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	384.72
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	4500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4500 per job

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TRM Reference Number	RIER161
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Custom
Type	Custom
Sub-type	Custom
Program Name	EnergyWise MultiFamily
Measure Name	Custom
Measure Description	Vendors install a variety of measures at multifamily facilities. Measures include
Baseline Description	For retrofit projects, the baseline efficiency case is the same as the existing, or pre-retrofit, case for the
Savings Principle	The high efficiency scenario is specific to the facility and may include one or more energy efficiency
Energy Savings calculation method	Calc
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER162
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Custom
Type	Multi-family
Sub-type	Low Income
Program Name	Income Eligible MultiFamily
Measure Name	Custom
Measure Description	Vendors install a variety of measures at multifamily facilities. Measures include
Baseline Description	For retrofit projects, the baseline efficiency case is the same as the existing, or pre-retrofit, case for the
Savings Principle	The high efficiency scenario is specific to the facility and may include one or more energy efficiency
Energy Savings calculation method	Calc
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	422.46
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	313.64
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER163
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	Programmable Thermostat (Electric heat only)
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	214.6
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.113
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.02
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.80
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER167
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Single Family Appliance Management
Measure Name	Programmable thermostat
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	330
kWh/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.176
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	11.92
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	37.77
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIER169
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	WiFi Thermostat
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.231
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.20
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.80
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER172
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyStar HVAC
Measure Name	WiFi programmable thermostat with cooling (gas)
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.231
kW reduction source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.6
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 50 per measure

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TRM Reference Number	RIER173
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyStar HVAC
Measure Name	WiFi programmable thermostat with cooling (oil)
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.231
kW reduction source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	6.6
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIER177
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	EW Single FamilyWiFi Thermostat - DR Enabled
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.231
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER178
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	Programmable Thermostat (Oil only)
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.176
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	3.4
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Home Energy Services Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER179
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise MultiFamily
Measure Name	THERMOSTAT Elec with AC
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	281
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.13
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.32
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER181
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise MultiFamily
Measure Name	THERMOSTAT Heat Pump
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	241
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.1
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.01
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.32
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER182
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise MultiFamily
Measure Name	THERMOSTAT OIL
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	2.3
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.32
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER185
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	THERMOSTAT Elec with AC
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	257
kWh/yr savings source	The Cadmus Group (2015). Massachusetts Low-Income Multifamily Initiative Impact Evaluation. Prepared for the MA PAs.
kWh/yr savings note	#N/A
kW reduction	0.13
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.41
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	14.98
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	4.45
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER186
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	THERMOSTAT AC Only
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	25
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.06
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	11.86
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.13
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER187
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	THERMOSTAT Heat Pump
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	241
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.1
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.01
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	14.77
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	4.29
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER188
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	THERMOSTAT OIL
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system providing space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	2.26
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	15.73
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.88
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER191
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	Early Replacement AC - SEER 18 (EE)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	306
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.851
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	942.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER192
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	Early Replacement AC - SEER 18 (Retire)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	269
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.748
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	942.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER193
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	Early Replacement AC - SEER 16 (EE)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	173
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.48
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	942.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER194
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Cooling
Sub-type	Central AC
Program Name	EnergyStar HVAC
Measure Name	Early Replacement AC - SEER 16 (Retire)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	269
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.748
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	942.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER196
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Cooling
Sub-type	Window AC
Program Name	Single Family Appliance Management
Measure Name	Window AC Replacements
Measure Description	Replacement of existing inefficient room air conditioners with more efficient models. This is only offered as a measure when an AC timer would not reduce usage during the peak period.
Baseline Description	The baseline efficiency case is the existing air conditioning unit.
Savings Principle	The high efficiency case is the high efficiency room air conditioning unit.
Energy Savings calculation method	Deemed
Savings unit	Replacement of existing window AC with high-efficiency window AC.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	0
Hours Source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Hours source note	#N/A
kWh/yr Savings	100
kWh/yr savings source	Quantec, LLC (2005). Evaluation of National Grid's 2003 Appliance Management Program: Room Air Conditioning Metering and Non-Energy Benefits Study. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.29
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Room Air Conditioner. Interactive Excel Spreadsheet found at www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/CalculatorConsumerRoomAC.xls
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	50.85
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	350.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 350 per measure

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TRM Reference Number	RIER197
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Insulation
Program Name	EnergyStar HVAC
Measure Name	Duct Sealing - 100 CFM redcution in leaks 15% of flow to 5%
Measure Description	A 66% reduction in duct leakage from 15% to 5% of supplied CFM.
Baseline Description	The baseline efficiency case is assumes a 15% leakage.
Savings Principle	The high efficiency case is a system with duct leakage reduced by 66% to 5% leakage.
Energy Savings calculation method	Deemed
Savings unit	Complete duct sealing job for existing HVAC system
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	212
kWh/yr savings source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kWh/yr savings note	#N/A
kW reduction	0.3
kW reduction source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 200 per measure

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TRM Reference Number	RIER199
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Insulation
Program Name	EnergyStar HVAC
Measure Name	Energy Star QI with Duct Modifications
Measure Description	50% reduction in duct leakage from 20% to 10%. This measure may also include duct modifications.
Baseline Description	The baseline efficiency case is a system with an installation that is inconsistent with manufacturer specifications and may include leaky ducts.
Savings Principle	The high efficiency case is a system with an installation that is consistent with manufacturer specifications and may have reduced duct leakage.
Energy Savings calculation method	Deemed
Savings unit	Completed job
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	513
kWh/yr savings source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kWh/yr savings note	#N/A
kW reduction	0.85
kW reduction source	RLW Analytics (2002). Market Research for the Rhode Island, Massachusetts, and Connecticut Residential HVAC Market. Prepared for National Grid, Northeast Utilities, NSTAR, Fitchburg Gas and Electric Light Company and United Illuminating;
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.26
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.25
Spill-Over (participant)	0.16
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 525 per measure

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TRM Reference Number	RIER203
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Heating System Retrofit-Furnace
Measure Description	The installation of high efficiency heating systems
Baseline Description	The baseline is the existing heating system.
Savings Principle	The high efficiency case includes replacing heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Heating system
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	132
kWh/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
kWh/yr savings note	#N/A
kW reduction	0.07
kW reduction source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	14.3
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	117.26
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.33
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER206
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heat Pumps
Sub-type	Early replacement
Program Name	EnergyStar HVAC
Measure Name	Early Replacement HP - SEER 18 (EE)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	1216
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.84
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 850 per measure

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TRM Reference Number	RIER207
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heat Pumps
Sub-type	Early replacement
Program Name	EnergyStar HVAC
Measure Name	Early Replacement HP - SEER 18 (Retire)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	1104
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.33
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 850 per measure

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TRM Reference Number	RIER208
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heat Pumps
Sub-type	Early replacement
Program Name	EnergyStar HVAC
Measure Name	Early Replacement HP - SEER 16 (EE)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	462
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.32
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 850 per measure

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TRM Reference Number	RIER210
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heat Pumps
Sub-type	Early replacement
Program Name	EnergyStar HVAC
Measure Name	Early Replacement HP - SEER 16 (Retire)
Measure Description	Early replacement of a Central Air Conditioning or Heat Pump Unit. This measure accounts for the additional savings achieved for the early replacement of existing inefficient AC or heat pump units over the remaining life of the existing equipment.
Baseline Description	The baseline efficiency case is assumed to be a typical 10-12 year-old central air-conditioning or heat pump unit with SEER 10, EER 8.5, and HSPF 7.0
Savings Principle	For the retirement savings over the remaining life of the existing AC unit, the efficient case is a SEER 13, EER 11, HSPF 7.6 unit. For the high efficiency savings over the lifetime of the new AC unit, the efficient case is a new high efficiency EER 14.5, EER 12, 8.2 HSPF unit.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installation of a new efficient air conditioner.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) × Hours_C Gross kW = Tons × (kBtu/hr per ton) × (1/SEER_base - 1/SEER_ee) Where: Tons = Deemed average equipment capacity: 2.7 tons for 16 SEER unit / 3.1 tons for 18 SEER unit 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of baseline equipment. SEER_ee = Seasonal Energy Efficiency Ratio of new equipment. Hours_C = Deemed average equivalent full load cooling hours
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	1104
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.33
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 850 per measure

.

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TRM Reference Number	RIER213
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	Single Family Appliance Management
Measure Name	Heating system replacement (oil)
Measure Description	Replacement of existing oil heating system with a new high efficiency system. Electric savings can be attributed to reduced fan run time and reduced usage of electric space heaters.
Baseline Description	The baseline efficiency case is the existing inefficient heating equipment.
Savings Principle	The high efficiency case is the new efficient heating equipment.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency heating system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	132
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.07
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	The Cadmus Group, Inc. (2012) Memo to HEHE Program Administrators Re: Impacts of Upcoming Federal Standards on HEHE.Gas Space and Water Heating Measures; June 8, 2012.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	18.4
Oil MMBtu/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.47
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	346.27
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	250.52
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	4500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	4500 per measure

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TRM Reference Number	RIER214
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	EnergyStar HVAC
Measure Name	Oil Heat Replacement
Measure Description	Replacement of existing oil or propane heating system with a new high efficiency system. Electric savings can be attributed to reduced fan run time and reduced usage of electric space heaters.
Baseline Description	The baseline efficiency case is the existing inefficient heating equipment.
Savings Principle	The high efficiency case is the new efficient heating equipment.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency heating system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	132
kWh/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.07
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	18.4
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Program Administrators of Massachusetts.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.01
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 200 per measure

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TRM Reference Number	RIER215
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Retrofit Boiler
Program Name	EnergyWise MultiFamily
Measure Name	Heating System Retrofit-Boiler
Measure Description	The installation of high efficiency heating systems
Baseline Description	The baseline is the existing heating system.
Savings Principle	The high efficiency case includes replacing heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Heating system
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	20.4
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boilers.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A

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CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER216
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Retrofit Furnace
Program Name	EnergyWise MultiFamily
Measure Name	Heating System Retrofit-Furnace
Measure Description	The installation of high efficiency heating systems
Baseline Description	The baseline is the existing heating system.
Savings Principle	The high efficiency case includes replacing heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Heating system
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	132
kWh/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
kWh/yr savings note	#N/A
kW reduction	0.07
kW reduction source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	14.3
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER217
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Retrofit Boiler
Program Name	Income Eligible MultiFamily
Measure Name	Heating System Retrofit-Boiler
Measure Description	The installation of high efficiency heating systems
Baseline Description	The baseline is the existing heating system.
Savings Principle	The high efficiency case includes replacing heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Heating system
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	20.4
Oil MMBtu/yr savings source	The Cadmus Group, Inc. (2012). Low Income Single Family Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boilers.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A

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CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	115.48
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER220
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	HVAC O&M
Sub-type	Heat Pump Tune Up
Program Name	EnergyStar HVAC
Measure Name	CoolSmart HP Digital Check
Measure Description	Tune-up of an existing heat pump system.
Baseline Description	The baseline efficiency case is a standard residential heat pump system that does not operating according to manufacturer specifications.
Savings Principle	The high efficiency case is the same baseline system but which operates according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed tune-up of existing heat pump system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × (1/SEER × Hours_C + 1/HSPF × Hours_H) × %SAVE Gross kW = Tons × (kBtu/hr per ton) × max[(1/EER),(1/HSPF)] × %SAVE Where: Tons = Deemed average equipment capacity: 2.6 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment HSPF = Heating efficiency of existing equipment Hours_C = Deemed average equivalent full load cooling hours Hours_H = Deemed average equivalent full load heating hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	0
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	330
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.205
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	KEMA (2013). Project 25 Prescriptive Gas Program Final Evaluation Report. Prepared for Massachusetts Energy Efficiency Program Administrators; Page 1-5
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.21
CF summer peak source	#N/A
CF summer peak note	Massachusetts Common Assumption
Coincidence factor (CF) winter peak	0.50
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	742.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIER221
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	HVAC O&M
Sub-type	HVAC Tune Up
Program Name	EnergyStar HVAC
Measure Name	CoolSmart AC Digital Check
Measure Description	Tune-up of an existing central AC system.
Baseline Description	The baseline efficiency case is a standard central air-conditioning system that does not operate according to manufacturer specifications.
Savings Principle	The high efficiency case is the same baseline system but which operates according to manufacturer specifications.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Completed tune-up of existing AC system
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × 1/SEER × Hours_C × %SAVE Gross kW = Tons × (kBtu/hr per ton) × 1/EER × %SAVE Where: Tons = Deemed average equipment capacity: 2.7 tons 12 kBtu/hr per ton = Conversion factor SEER = Seasonal Energy Efficiency Ratio of existing equipment Hours_C = Deemed average equivalent full load cooling hours 5%SAVE = Average percent demand reduction; National Grid assumption based on regional PA working groups. EER = Peak efficiency of existing equipment
Hours	360
Hours Source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
Hours source note	#N/A
kWh/yr Savings	45
kWh/yr savings source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kWh/yr savings note	#N/A
kW reduction	0.147
kW reduction source	ADM Associated, Inc. (2009). Residential Central AC Regional Evaluation. Prepared for NSTAR, National Grid, Connecticut Light & Power and United Illuminating.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	NYSERDA Deemed Savings Database (Rev 11).
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.25
CF summer peak source	#N/A
CF summer peak note	Massachusetts Common Assumption
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	Massachusetts Common Assumption
Gross Measure TRC unit	175.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 175 per measure

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TRM Reference Number	RIER222
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise MultiFamily
Measure Name	Pipe Wrap Heating Oil
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.16
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER225
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Pipe Wrap Heating Oil
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.16
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	6.90
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER228
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Motors
Sub-type	ECM Motor
Program Name	EnergyStar HVAC
Measure Name	ECM Pumps
Measure Description	Heating hot water circulation retrofit projects replacing the existing hot water circulation systems with ECM pumps and zone valves.
Baseline Description	The baseline case is standard efficiency steady-state motor without variable speed capabilities.
Savings Principle	The efficient case is the installation of a pump with an electronically commutated motor (ECM) with variable speed capabilities on a boiler.
Energy Savings calculation method	Deemed
Savings unit	Installed ECM circulator pump retrofit project.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	142.3
kWh/yr savings source	The Cadmus Group (2012). Impact Evaluation of the 2011-2012 ECM Circulation Pump Pilot Program.
kWh/yr savings note	#N/A
kW reduction	0.076
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	The Cadmus Group (2012). Impact Evaluation of the 2011-2012 ECM Circulation Pump Pilot Program.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	750.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER235
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	LED Fixture
Program Name	EnergyStar Lighting
Measure Name	Outdoor LED Fixture
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	Existing lighting mix.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Retrofitted fixture
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	115.36
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.096068
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	30.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per fixture

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TRM Reference Number	RIER236
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	LED Screw Base
Program Name	EnergyWise
Measure Name	LED Outdoor Fixture
Measure Description	The installation of Light-Emitting Diode (LED) outdoor fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Deemed
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	46.32
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.046
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER237
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Dwelling Reflector
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Ext Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER238
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Common Reflector
Program Name	EnergyWise MultiFamily
Measure Name	Common Ext Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER240
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Dwelling LED
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Ext LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is a blend of incandescent, compact fluorescent, and halgoen lamps. For home audit applications, the baseline is the existing fixture.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified compact fluorescent light fixture wired for exclusive use with pin-based CFLs.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11

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measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER241
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Common LED
Program Name	EnergyWise MultiFamily
Measure Name	Common Ext LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is is the existing lighting hours of use.
Savings Principle	The high efficiency case is lights thaare using fewer hours, reducing energy.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

.

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TRM Reference Number	RIER242
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Dwelling Reflector
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Ext Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	17.81
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	11.15
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER243
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Common Reflector
Program Name	Income Eligible MultiFamily
Measure Name	Common Ext Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.37
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	12.31
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER245
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Dwelling LED
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Ext LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is a blend of incandescent, compact fluorescent, and halgoen lamps. For home audit applications, the baseline is the existing fixture.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified compact fluorescent light fixture wired for exclusive use with pin-based CFLs.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11

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measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.65
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	13.01
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER247
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Common LED
Program Name	Income Eligible MultiFamily
Measure Name	Common Ext LED Bulbs
Measure Description	The installation of ENERGY STAR® LED outdoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	115
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	189.94
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	11.19
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER248
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Exterior
Sub-type	Common LED
Program Name	EnergyWise MultiFamily
Measure Name	Common Ext LED Bulbs
Measure Description	The installation of ENERGY STAR® LED outdoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	141.8
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER250
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	LED Bulbs (15,000)
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	37.27
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.031042271
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.05
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.03
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.10
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.90
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 5 per bulb

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TRM Reference Number	RIER251
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	LED (15,000) HTR
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	37.27
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.031042271
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.05
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.03
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	10.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per bulb

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TRM Reference Number	RIER280
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Fixture
Program Name	EnergyWise
Measure Name	LED Fixture
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, CFLs and other bulbs types, as provided by market research or for a home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Deemed
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	45
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.046
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER282
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Fixture
Program Name	EnergyStar Lighting
Measure Name	LED Fixtures
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, CFLs and other bulbs types, as provided by market research or for a home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakW × Hours Gross kW = Qty × deltakW Where: Qty = Total number of units. DeltakW = Deemed average kW reduction per unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	55.54
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.046252984
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.07
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.93
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	35.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 7 per fixture

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TRM Reference Number	RIER289
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyWise
Measure Name	LED Bulbs
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Deemed
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	47.6
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.008
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Optimal Energy, Inc. (2008). Memo:Non-Electric Benefits Analysis Update. Prepared for Dave Weber, NSTAR.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER291
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	LED A Lamps
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	37.27
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.031042271
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.05
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.03
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.20
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.80
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	10.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 3.5 per bulb

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TRM Reference Number	RIER293
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	LED Bulbs (EISA Exempt)
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	52.39
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.043630098
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.06
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.04
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	Expected lifetime from ENERGY STAR
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.20
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.80
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	14.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per bulb

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TRM Reference Number	RIER295
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	Single Family Appliance Management
Measure Name	LED Bulbs LI
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1022
Hours Source	Nexus Market Research, RLW Analytics and GDS Associates (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
Hours source note	#N/A
kWh/yr Savings	45.63
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.046300409
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	3.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	229.77
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	17.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 17 per measure

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TRM Reference Number	RIER298
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Fixture
Program Name	Single Family Appliance Management
Measure Name	Indoor Fixtures
Measure Description	The installation of ENERGY STAR® LED indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	0
Savings Principle	The high efficiency case is an ENERGY STAR® qualified compact fluorescent light fixture wired for exclusive use with and LED.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Retrofitted fixture
Savings Equation	Gross kWh = Qty × deltakW × Hours Gross kW = Qty × deltakW Where: Qty = Total number of units. DeltakW = Deemed average kW reduction per unit. Hours = Deemed average annual operating hours.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	67.99
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.068987609
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	3.58
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	230.49
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIER301
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	School Program LED Bulbs
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	Existing lighting mix.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed lamp
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	32.86
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.031042271
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.04
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.02
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.50
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.20
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.80
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per bulb

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TRM Reference Number	RIER304
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	HTR LED A Lamps
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	37.27
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.031042271
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.06
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.03
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.01
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	15.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 10 per bulb

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TRM Reference Number	RIER306
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyStar Lighting
Measure Name	LED Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × (kW_base - kW_ee) × Hours Gross kW = Qty × (kW_base - kW_ee) Where: Qty = Total number of units. kW_base = Deemed average demand per baseline unit. kW_ee = Deemed average demand per high-efficiency unit. Hours = Deemed average annual operating hours.
Hours	1059
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	57.15
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.047597109
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	-0.06
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	-0.04
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	-0.01
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	0.98
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.14
CF summer peak source	Nexus Market Research and RLW Analytics (2009). Residential Lighting Markdown Impact Evaluation. Prepared for Markdown and Buydown Program Sponsors in CT, MA, RI, and VT.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.20
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.80
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	15.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 10 per bulb

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TRM Reference Number	RIER307
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyWise
Measure Name	LED Bulbs (EISA Exempt)
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Deemed
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	43.6
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.044
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER308
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	LED Screw Base
Program Name	EnergyWise
Measure Name	LED Bulbs Reflectors
Measure Description	The installation of Light-Emitting Diode (LED) reflectors. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Deemed
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	47.6
kWh/yr savings source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kWh/yr savings note	#N/A
kW reduction	0.048
kW reduction source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER309
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling EISA
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Int EISA Exempt
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER310
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common EISA
Program Name	EnergyWise MultiFamily
Measure Name	Common Int EISA Exempt
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER311
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling Reflector
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Int Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER312
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common Reflector
Program Name	EnergyWise MultiFamily
Measure Name	Common Int Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER314
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling LED
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Int LED Fixture
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, CFLs and other bulbs types, as provided by market research or for a home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER316
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common LED
Program Name	EnergyWise MultiFamily
Measure Name	Common Int LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is a blend of incandescent, compact fluorescent, and halgoen lamps. For home audit applications, the baseline is the existing fixture.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified compact fluorescent light fixture wired for exclusive use with pin-based CFLs.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9

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measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER319
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling EISA
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Int EISA Exempt
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.89
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	12.70
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER320
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common EISA
Program Name	Income Eligible MultiFamily
Measure Name	Common Int EISA Exempt
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	17.79
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	11.14
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER321
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling Reflector
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Int Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	17.74
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	11.10
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER322
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common Reflector
Program Name	Income Eligible MultiFamily
Measure Name	Common Int Reflector
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, halogens, CFLs and other bulbs types, as provided by market research or for EISA exempt bulbs and bulbs installed through an home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.92
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	12.72
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER324
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling LED
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Int LED Fixture
Measure Description	The installation of Light-Emitting Diode (LED) screw-in bulbs and fixtures. LEDs offer comparable luminosity to incandescent bulbs at significantly less wattage and significantly longer lamp lifetimes.
Baseline Description	The baseline efficiency case is blend of incandescents, CFLs and other bulbs types, as provided by market research or for a home energy audit, the base line is a 65 Watt incandescent.
Savings Principle	The high efficiency case is and ENERGY STAR® qualified LED fixture.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	NMR Group, Northeast Residential Lighting Hours-of-Use Study, May 2014
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	18.87
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	12.44
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER326
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common LED
Program Name	Income Eligible MultiFamily
Measure Name	Common Int LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is a blend of incandescent, compact fluorescent, and halgoen lamps. For home audit applications, the baseline is the existing fixture.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified compact fluorescent light fixture wired for exclusive use with pin-based CFLs.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9

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measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.17
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.54
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	12.94
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER328
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common LED
Program Name	Income Eligible MultiFamily
Measure Name	Common Ext LED Fixture
Measure Description	The installation of ENERGY STAR® compact fluorescent (CFL) indoor fixtures. Compact fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly less wattage and significantly longer lifetimes. Hardwired fluorescent fixtures offer comparable luminosity to incandescent fixtures at significantly lower wattage and offer significantly longer lifespan.
Baseline Description	The baseline efficiency case is is the existing lighting hours of use.
Savings Principle	The high efficiency case is lights thaare using fewer hours, reducing energy.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Rebated lamp or fixture.
Savings Equation	Gross kWh = [(QTY_pre × Watts_pre × Hours_base) - (QTY_ee × Watts_ee × Hours_ee)]/1000 × 52 Gross kW = [(QTY_pre × Watts_pre) - (QTY_ee × Watts_ee)]/1000 Where: QTY_pre = Quantity of pre-retrofit fixtures/bulbs QTY_ee = Quantity of efficient fixtures/bulbs installed Watts_pre = Rated watts of pre-retrofit fixtures/bulbs Watts_ee = Rated watts of efficient fixtures/bulbs installed Hours_pre = Weekly hours of operation for pre-retrofit case lighting fixtures/bulbs Hours_ee = Weekly hours of operation for efficient lighting fixtures/bulbs 1000 = Watts per kW 52 = Weeks per year
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	25.36
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	17.26
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER330
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common LED
Program Name	Income Eligible MultiFamily
Measure Name	Common Int LED Bulbs
Measure Description	The installation of ENERGY STAR® LED indoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	304.2
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	21.49
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	13.88
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER331
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling LED
Program Name	Income Eligible MultiFamily
Measure Name	Dwelling Int LED Bulbs
Measure Description	The installation of ENERGY STAR® LED indoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	41
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	17.94
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	11.25
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER333
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Common LED
Program Name	EnergyWise MultiFamily
Measure Name	Common Int LED Bulbs
Measure Description	The installation of ENERGY STAR® LED indoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	119.1
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER334
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Lighting
Type	Interior
Sub-type	Dwelling LED
Program Name	EnergyWise MultiFamily
Measure Name	Dwelling Int LED Bulbs
Measure Description	The installation of ENERGY STAR® LED indoor bulbs.
Baseline Description	The baseline efficiency case is the existing installed bulb.
Savings Principle	The high efficiency case is bulbs that use fewer watts.
Energy Savings calculation method	Deemed
Savings unit	Installed bulb
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	35
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	3.50
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER337
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Motors/Drives
Type	Variable Speed Drive
Sub-type	Pump
Program Name	EnergyStar Products
Measure Name	Pool pump (2
Measure Description	The installation of a 2-speed or variable speed drive pool pump. Operating a pool pump for a longer period of time at a lower wattage can move the same amount of water using significantly less energy.
Baseline Description	The baseline efficiency case is a single speed pump.
Savings Principle	The high efficiency case is a 2-speed or variable speed pump.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed efficient pool pump.
Savings Equation	Gross kWh = Qty × kWh_base × %SAVE Gross kW = Qty × deltakW Where: Qty = Total number of units. kWh_base = Deemed average annual kWh consumption per baseline unit. %SAVE = Deemed average savings factor. DeltakW = Deemed average kW reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	824
kWh/yr savings source	Pacific Gas and Electric The Multi-Speed Pool Pump Fact Sheet.
kWh/yr savings note	#N/A
kW reduction	0.35
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Davis Energy Group (2008). Proposal Information Template for Residential Pool Pump Measure Revisions. Prepared for Pacific Gas and Electric Company.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	300.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 250 per measure

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TRM Reference Number	RIER339
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Motors/Drives
Type	Variable Speed Drive
Sub-type	Pump
Program Name	EnergyStar Products
Measure Name	Pool pump (variable)
Measure Description	The installation of a 2-speed or variable speed drive pool pump. Operating a pool pump for a longer period of time at a lower wattage can move the same amount of water using significantly less energy.
Baseline Description	The baseline efficiency case is a single speed pump.
Savings Principle	The high efficiency case is a 2-speed or variable speed pump.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed efficient pool pump.
Savings Equation	Gross kWh = Qty × kWh_base × %SAVE Gross kW = Qty × deltakW Where: Qty = Total number of units. kWh_base = Deemed average annual kWh consumption per baseline unit. %SAVE = Deemed average savings factor. DeltakW = Deemed average kW reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1062
kWh/yr savings source	Pacific Gas and Electric The Multi-Speed Pool Pump Fact Sheet.
kWh/yr savings note	#N/A
kW reduction	0.5
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Davis Energy Group (2008). Proposal Information Template for Residential Pool Pump Measure Revisions. Prepared for Pacific Gas and Electric Company.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	650.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIER341
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Participant
Type	NEI
Sub-type	Low Income
Program Name	Income Eligible MultiFamily
Measure Name	Participant (NEB)
Measure Description	This row identifies a participant for tracking and cost purposes.
Baseline Description	N/A
Savings Principle	N/A
Energy Savings calculation method	N/A
Savings unit	N/A
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.77
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00

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Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	7.70
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER342
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Participant
Type	Participant
Sub-type	Participant
Program Name	EnergyWise MultiFamily
Measure Name	Participant
Measure Description	This row identifies a participant for tracking and cost purposes.
Baseline Description	0
Savings Principle	0
Energy Savings calculation method	0
Savings unit	0
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A

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Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER343
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	EnergyStar Products
Measure Name	Advanced Power Strips
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Rebated smart strip.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	346
kWh/yr savings source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	0.074
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	100.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 35 per measure

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TRM Reference Number	RIER345
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	Income Eligible MultiFamily
Measure Name	Smart Strips
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Rebated smart strip.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	75.1
kWh/yr savings source	NEEP (2012). Advanced Power Strips Deemed Savings Methodology.
kWh/yr savings note	#N/A
kW reduction	0.001
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	Nexus Market Research and RLW Analytics (2008). Residential Lighting Measure Life Study. Prepared for New England Residential Lighting Program Sponsors.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.77
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.01
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.76
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	398.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 380/audit with multiple installed measures

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TRM Reference Number	RIER346
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	EnergyWise
Measure Name	Smart Strip
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Rebated smart strip.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	21.6
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.004
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER347
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	EnergyWise MultiFamily
Measure Name	Smart Strips
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Rebated smart strip.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	75.1
kWh/yr savings source	NEEP (2012). Advanced Power Strips Deemed Savings Methodology.
kWh/yr savings note	#N/A
kW reduction	0.001
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	305.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 296/audit with multiple installed measures

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TRM Reference Number	RIER348
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	Single Family Appliance Management
Measure Name	Smart Strips
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Rebated smart strip.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	75
kWh/yr savings source	ECOS 2009 Smart Plug Strips: Draft Report
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.01
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.75
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	30.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 30 per measure

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TRM Reference Number	RIER349
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Plug Load
Type	Smart Strips
Sub-type	Smart Strip
Program Name	EnergyStar Products
Measure Name	Smart Strips
Measure Description	The basic measures switches off plug load using current sensors and switching devices which turn off plug load when electrical current drops below threshold low levels. The advanced measure shuts devices off after it no longer senses activity from their infrared controls.
Baseline Description	The baseline efficiency case is the absence power strip and leaving peripheral devices plugged in or using a power surge protector and leaving peripheral devices on
Savings Principle	The high efficiency case is the use of a smart strip or advanced smart strip.
Energy Savings calculation method	Deemed
Savings unit	Per smart strip
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	79
kWh/yr savings source	ECOS 2009 Smart Plug Strips: Draft Report
kWh/yr savings note	#N/A
kW reduction	0.017
kW reduction source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	The Cadmus Group, Inc. (2012). Demand Impact Model. Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	20.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 15 per measure

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TRM Reference Number	RIER350
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Refrigeration
Type	Refrigeration O&M
Sub-type	Refrigerator Brush
Program Name	EnergyWise
Measure Name	Refrigerator Brush
Measure Description	The cleaning of refrigerator coils.
Baseline Description	A refrigerator with uncleaned coils.
Savings Principle	A refrigerator with coils cleaned by an auditor.
Energy Savings calculation method	Deemed
Savings unit	Per brushed refrigerator coil
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	10.9
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.001
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.93
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER352
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Vending Miser
Type	Vending Miser
Sub-type	Vending Miser
Program Name	EnergyWise MultiFamily
Measure Name	Vending Miser
Measure Description	Controls significantly reduce the energy consumption of refrigerated beverage vending machine lighting and refrigeration systems by powering down these systems during periods of inactivity while maintaining a refrigerated product. This measure applies to refrigerated beverage vending machines and glass front refrigerated coolers. This measure does not apply to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1612
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.184
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER353
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Vending Miser
Type	Vending Miser
Sub-type	Vending Miser
Program Name	Income Eligible MultiFamily
Measure Name	Vending Miser
Measure Description	Controls significantly reduce the energy consumption of refrigerated beverage vending machine lighting and refrigeration systems by powering down these systems during periods of inactivity while maintaining a refrigerated product. This measure applies to refrigerated beverage vending machines and glass front refrigerated coolers. This measure does not apply to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1612
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.184
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	21.71
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	16.13
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER354
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	EnergyWise MultiFamily
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	305.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 296/audit with multiple installed measures

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TRM Reference Number	RIER358
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	EnergyWise
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a residential setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	36.6
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.006
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group, Inc. (2012). Home Energy Services Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER360
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Single Family Appliance Management
Measure Name	DHWater Measure (electric)
Measure Description	DHW measures include high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	134
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	4028.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	6.44
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	29.67
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per measure

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TRM Reference Number	RIER362
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Single Family Appliance Management
Measure Name	DHWater Measure (gas & other)
Measure Description	DHW measures include high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.9
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	4028.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	4.68
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	28.33
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per measure

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TRM Reference Number	RIER364
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Single Family Appliance Management
Measure Name	DHWater Measure (oil)
Measure Description	DHW measures include high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Gross MMBtu_Oil = Qty × deltaMMBtu_Oil Gross MMBtu_Propane = Qty × deltaMMBtu_Propane Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit. deltaMMBtu_Oil = Average annual oil reduction per unit deltaMMBtu_Propane = Average annual propane reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.7
Oil MMBtu/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	4028.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	5.92
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	28.33
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 8 per measure

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TRM Reference Number	RIER367
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Single Family Appliance Management
Measure Name	Waterbed mattress replacement
Measure Description	Replacement of waterbed mattress with a standard mattress.
Baseline Description	The baseline efficiency case is an existing waterbed mattress.
Savings Principle	The high efficiency case is a new standard mattress.
Energy Savings calculation method	Deemed
Savings unit	Replacement of existing waterbed mattress with new standard mattress.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	872
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.19
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	http://www.serta.com/best-mattress-FAQs-mattresses-Serta-Number--1-Best-Selling-Mattress.html
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	11.75
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	8.72
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	600.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 600 per measure

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TRM Reference Number	RIER373
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner electric DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	372
kWh/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
kWh/yr savings note	#N/A
kW reduction	0.055
kW reduction source	PGE Low Flow Showerhead and Thermostatic Restriction Valve
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3022.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	40.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 15 per measure

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TRM Reference Number	RIER379
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead thermo Control (ladybug electric DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	76
kWh/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
kWh/yr savings note	#N/A
kW reduction	0.011
kW reduction source	PGE Low Flow Showerhead and Thermostatic Restriction Valve
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	621.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	30.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 11 per measure

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TRM Reference Number	RIER385
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner oil. Propane DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	2.09
Oil MMBtu/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	1.2
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3022.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	40.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 15 per measure

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TRM Reference Number	RIER386
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead thermo Control (ladybug oil. Propane DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.43
Oil MMBtu/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0.38
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	621.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	30.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 11 per measure

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TRM Reference Number	RIER387
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead thermo Control (ladybug gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	621.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	30.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 11 per measure

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TRM Reference Number	RIER388
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyStar Products
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	National Grid assumption based on regional PA working groups.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3022.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	40.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 15 per measure

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TRM Reference Number	RIER389
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	EnergyWise MultiFamily
Measure Name	AERATOR Oil
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.86
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER391
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	EnergyWise MultiFamily
Measure Name	SHOWERHEAD Elec
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	129
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER392
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	SHOWERHEAD Oil
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	1.14
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER394
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	TSV Showerhead Oil
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.39
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2723.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER395
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	TSV Showerhead Other
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2723.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER399
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	TSV Showerhead Elec
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	335
kWh/yr savings source	National Grid (2014). Review of ShowerStart evolve.
kWh/yr savings note	#N/A
kW reduction	0.06
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER402
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Income Eligible MultiFamily
Measure Name	AERATOR Oil
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.28
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.57
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER404
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Income Eligible MultiFamily
Measure Name	SHOWERHEAD Oil
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	1.07
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER406
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Income Eligible MultiFamily
Measure Name	AERATOR Elec
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	97
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.98
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER407
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Income Eligible MultiFamily
Measure Name	SHOWERHEAD Elec
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	217
kWh/yr savings source	The Cadmus Group (2015). Massachusetts Low-Income Multifamily Initiative Impact Evaluation. Prepared for the MA PAs.
kWh/yr savings note	#N/A
kW reduction	0.04
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	The Cadmus Group (2015). Massachusetts Low-Income Multifamily Initiative Impact Evaluation. Prepared for the MA PAs.
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	2.92
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.18
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER408
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Income Eligible MultiFamily
Measure Name	TSV Showerhead Elec
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed showerhead.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	335
kWh/yr savings source	National Grid (2014). Review of ShowerStart evolve.
kWh/yr savings note	#N/A
kW reduction	0.06
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Massachusetts common assumption
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2165.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	4.51
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	3.36
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER410
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise
Measure Name	EW Pipe Insulation
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	33.3
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.003
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER411
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise MultiFamily
Measure Name	Pipe Wrap DHW Elec
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	129
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER412
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise MultiFamily
Measure Name	Pipe Wrap DHW Oil
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	1.14
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER415
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Pipe Wrap DHW Elec
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	129
kWh/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0.1
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.86
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.58
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	8.35
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.30
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER416
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Pipe Wrap DHW Oil
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear Foot
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	1.14
Oil MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts Multifamily Program Impact Analysis July 2012 – Revised May 2013. Prepared for MA PAs
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	8.70
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.01
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER421
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Tankless WH Oil
Measure Description	Installation of high efficiency water heating system.
Baseline Description	The baseline is the existing water heating system.
Savings Principle	The high efficiency case includes replacing water heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Water Heating System
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE; Page 10.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	374.99
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.18
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER424
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Standalone WH Oil
Measure Description	Installation of high efficiency water heating system.
Baseline Description	The baseline is the existing water heating system.
Savings Principle	The high efficiency case includes replacing water heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Water Heating System
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE; Page 10.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	254.91
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.18
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER425
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Standalone WH Other
Measure Description	Installation of high efficiency water heating system.
Baseline Description	The baseline is the existing water heating system.
Savings Principle	The high efficiency case includes replacing water heating systems with higher efficiency systems.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Water Heating System
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE; Page 10.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.58
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.18
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIER427
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Audit
Sub-type	Educational Kit
Program Name	Single Family Appliance Management
Measure Name	Basic Educational Measures
Measure Description	Installation of basic educational measures during an audit to help customers become more aware of energy efficiency.
Baseline Description	The baseline efficiency case assumes no measures installed.
Savings Principle	The high efficiency case includes basic educational measures such as CFLs, low flow showerheads, pool and air conditioner timers, torchieres, and programmable thermostats.
Energy Savings calculation method	Deemed
Savings unit	Completed audit.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	138
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.03
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	#N/A
measure life note	National Grid assumption based on regional PA working groups.
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	9.56
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	176.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$176 per kit

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TRM Reference Number	RIER429
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	New Movers
Measure Description	A Home Energy report sent to electric customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	A control group of homes that does not receive Home Energy Reports
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Customer receiving energy reports
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	9.07
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 9.07 per participant

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TRM Reference Number	RIER433
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	Opt-out dual fuel
Measure Description	A Home Energy report sent to electric customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	No Home Energy Report.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Per participant
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	1.08
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	9.07
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 9.07 per participant

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TRM Reference Number	RIER434
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	Opt-Out electric
Measure Description	A Home Energy report sent to electric customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	No Home Energy Report.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Per participant
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	0.93
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	9.07
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 9.07 per participant

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TRM Reference Number	RIER435
Fuel	Electric
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	New Movers dual fuel
Measure Description	A Home Energy report sent to electric customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	A control group of homes that does not receive Home Energy Reports
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Customer receiving energy reports
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.73
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	9.07
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 9.07 per participant

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TRM Reference Number	RIER438
Fuel	Electric
Sector	Residential
Project Type	0
Category	Lighting
Type	Interior
Sub-type	Torchiere
Program Name	EnergyWise
Measure Name	EW TORCHIERE1
Measure Description	The installation of ENERGY STAR® torchieres. Torchieres offer comparable luminosity to incandescents at significantly less wattage and significantly longer lifetimes.
Baseline Description	The baseline efficiency case is a blend of incandescent, compact fluorescent, and halgoen lamps. For home audit applications, the baseline is the existing fixture.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified torchiere.
Energy Savings calculation method	Deemed
Savings unit	Installed torchiere
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	40.1
kWh/yr savings source	The Cadmus Group, Inc (2012). Rhode Island EnergyWise Single Family Impact Evaluation.
kWh/yr savings note	#N/A
kW reduction	0.014
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	4
measure life source	MA Residential Lighting Worksheet 2017, including reference to Market Adoption Model
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.13
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIER439
Fuel	Electric
Sector	Residential
Project Type	0
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise
Measure Name	EW SHOWERHEAD
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	34.3
kWh/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
kWh/yr savings note	#N/A
kW reduction	0.004
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.94
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2401.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group, Inc. (2012). Home Energy Services Impact Evaluation. Prepared for the Electric and Gas Prog Admins of MA.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group, Inc (2008). EnergyWise 2008 Program Evaluation
Net-to-Gross note	#N/A
Gross Measure TRC unit	790.00
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 766/audit with multiple installed measures

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TRM Reference Number	RIEC008
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Custom
Type	Lighting
Sub-type	Lighting
Program Name	Direct Install
Measure Name	Custom lighting
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.04

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RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.02
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.13
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC022
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Custom
Type	Other
Sub-type	Other
Program Name	Direct Install
Measure Name	Custom other
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.81

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RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	0.77
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.53
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC012
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Custom
Type	Refrigeration
Sub-type	Refrigeration
Program Name	Direct Install
Measure Name	Custom refrigeration
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.60

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RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.49
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.69
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC014
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Direct Install
Measure Name	Programmable Thermostats
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system providing space heating or cooling without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed thermostat
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC015
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Lighting
Type	Controls
Sub-type	Occupancy Sensor
Program Name	Direct Install
Measure Name	Occupancy sensors
Measure Description	This measure promotes the installation of lighting controls in both lost-opportunity and retrofit applications. Promoted technologies include occupancy sensors and daylight dimming controls.
Baseline Description	The baseline efficiency case assumes no controls (retrofit) or code-compliant controls (new construction).
Savings Principle	The high efficiency case involves lighting fixtures connected to controls that reduce the pre-retrofit or baseline hours of operation.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed lighting controls project.
Savings Equation	Gross kWh = SUM[QTY_i × Watts_i × (Hours_base_i - Hours_ee_i)] / (Watts per kW) Gross kW = SUM(QTY_i × Watts_i) / (Watts per kW) Where: QTY_i = Quantity in controlled fixtures in location i Watts_i = Connected wattage of controlled fixtures in location i Hours_base_i = Total annual hours that the connected lighting in location i operated without controls (for retrofit installations) or would have operated with code-compliance controls (for new construction installations). Hours_ee_i = Total annual hours that the connected lighting in location i operates with the lighting controls implemented. 1,000 Watts per kW = Conversion factor deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	9
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.87
RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRe note	#N/A
RR demand (RRd) summer peak	0.94
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.94
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.35
CF summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.28
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC016
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Lighting
Type	Exterior
Sub-type	LED Fixture
Program Name	Direct Install
Measure Name	Exterior LED Fixtures
Measure Description	The installation of hardwired ENERGY STAR® LED outdoor fixtures with pin-based bulbs. Savings for this measure are attributable to high efficiency outdoor lighting fixtures and are treated similarly to indoor fixtures.
Baseline Description	Lighting baseline mix.
Savings Principle	The high efficiency case is the installation of LED lighting fixtures.
Energy Savings calculation method	Calculated using deemed inputs
Savings unit	Installed LED fixtures
Savings Equation	Gross kWh = Qty × deltakW × Hours Gross kW = Qty × deltakW Where: Qty = Total number of units. DeltakW = Deemed average kW reduction per unit. Hours = Deemed average annual operating hours.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.05
RRe source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00

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RRd winter peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.11
CF summer peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.91
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC019
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Lighting
Type	Interior
Sub-type	Efficient Lighting
Program Name	Direct Install
Measure Name	Lighting systems
Measure Description	This measure promotes the installation of efficient lighting including, but not limited to, efficient fluorescent lamps, ballasts, and fixtures, solid state lighting, and efficient high intensity discharge (HID) lamps, ballasts, and fixtures.
Baseline Description	For retrofit installations, the baseline efficiency case is project-specific and is determined using actual fixture types and counts from the existing space. Existing fixture wattages are provided in the Table 4 of Appendix A. For lost opportunity installations, the baseline case is based on comparable code-compliant installations and standard practices.
Savings Principle	For both new construction and retrofit installations, the high efficiency case is project-specific and is determined using actual fixture counts for the project and wattages found in Tables 3 and 5 in Appendix A.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed high-efficiency lighting project.
Savings Equation	Gross kWh = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) × Hours Gross kW = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: QTY_base_i = Quantity of baseline fixtures in location i Watts_base_i = Connected wattage of baseline fixtures in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j 1,000 Watts per kW = Conversion factor Hours = Lighting annual hours of operation: site-specific. deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11

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measure life source	Nexus Market Research and RLW Analytics (2004). Impact Evaluation of the Massachusetts, Rhode Island, and Vermont 2003 Residential Lighting Programs. Submitted to The Cape Light Compact, State of Vermont Public Service Department for Efficiency Vermont, N
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.03
RRe source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRe note	#N/A
RR demand (RRd) summer peak	0.96
RRd summer peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.96
RRd winter peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.55
CF summer peak source	DNV GL (2015) RI Small Business EE Program Prescriptive Lighting Study
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.45
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC021
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Lighting
Type	Signage
Sub-type	Exit Sign LED
Program Name	Direct Install
Measure Name	LED Exit Signs
Measure Description	The installation of an LED exit sign
Baseline Description	For retrofit installations, the baseline efficiency case is project-specific and is determined using actual fixture types and counts from the existing space. For lost opportunity installations, the baseline case is based on comparable code-compliant installations and standard practices.
Savings Principle	The high efficiency case is the installation of LED exit signs.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed high-efficiency lighting project.
Savings Equation	Gross kWh = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) × Hours Gross kW = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: QTY_base_i = Quantity of baseline fixtures in location i Watts_base_i = Connected wattage of baseline fixtures in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j 1,000 Watts per kW = Conversion factor Hours = Lighting annual hours of operation: site-specific. deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	Summit Blue Consulting (2008). Large Commercial and Industrial Retrofit Program Impact Evaluation 2007. Prepared for National Grid
RRe note	#N/A
RR demand (RRd) summer peak	0.98
RRd summer peak source	Summit Blue Consulting (2008). Large Commercial and Industrial Retrofit Program Impact Evaluation 2007. Prepared for National Grid
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.98
RRd winter peak source	Summit Blue Consulting (2008). Large Commercial and Industrial Retrofit Program Impact Evaluation 2007. Prepared for National Grid
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are assumed to be 1.0 since exit signs are on 8,760 hours a year
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC023
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Door Heater Control
Program Name	Direct Install
Measure Name	Door heater control
Measure Description	The Installation of controls to reduce the run time of door and frame heaters for freezers and walk-in or reach-in coolers. The reduced heating also results in a reduced cooling load.
Baseline Description	The baseline efficiency case is a cooler or freezer door heater that operates 8,760 hours per year without any controls.
Savings Principle	The high efficiency case is a cooler or freezer door heater connected to a heater control system, which controls the door heaters by calculating the dew point of the store, and controlling the anti-sweat heater based on specific algorithms for freezer and cooler doors.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed door heater controls on existing cooler/freezer.
Savings Equation	Gross kWh = kW_DoorHeater × %OFF × Hours Gross kW = kW_DoorHeater × %OFF Where: kW_DoorHeater = Total demand of the door heater, calculated as Volts * Amps / 1000: site-specific %OFF = Door heater Off time: 46% for freezer door heaters or 74% for cooler door heaters Hours = Door heater annual run hours before controls
Hours	0
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.50
CF summer peak source	HEC, Inc. (1995). Analysis of Door Master Walk-In Cooler Anti-Sweat Door Heater Controls Installed at 10 Sites in MA. Prepared for NEPSCo; Table 9.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC024
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Door Heater Control
Program Name	Direct Install
Measure Name	Freezer Door Heater Controls
Measure Description	The Installation of controls to reduce the run time of door and frame heaters for freezers and walk-in or reach-in coolers. The reduced heating also results in a reduced cooling load.
Baseline Description	The baseline efficiency case is a cooler or freezer door heater that operates 8,760 hours per year without any controls.
Savings Principle	The high efficiency case is a cooler or freezer door heater connected to a heater control system, which controls the door heaters by calculating the dew point of the store, and controlling the anti-sweat heater based on specific algorithms for freezer and cooler doors.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed door heater controls on existing cooler/freezer.
Savings Equation	Gross kWh = kW_DoorHeater × %OFF × Hours Gross kW = kW_DoorHeater × %OFF Where: kW_DoorHeater = Total demand of the door heater, calculated as Volts * Amps / 1000: site-specific %OFF = Door heater Off time: 46% for freezer door heaters or 74% for cooler door heaters Hours = Door heater annual run hours before controls
Hours	0
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.50
CF summer peak source	HEC, Inc. (1995). Analysis of Door Master Walk-In Cooler Anti-Sweat Door Heater Controls Installed at 10 Sites in MA. Prepared for NEPSCo; Table 9.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC025
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Fan Control
Program Name	Direct Install
Measure Name	Fan Control
Measure Description	Installation of controls to modulate the evaporator fans based on temperature control. Energy savings include: fan energy savings from reduced fan operating hours, refrigeration energy savings from reduced waste heat, and compressor energy savings resulting from the electronic temperature control.
Baseline Description	The baseline efficiency case assumes evaporator fans that run 8760 annual hours with no temperature control.
Savings Principle	The high efficiency case is the use of an energy management system to control evaporator fan operation based on temperature.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed controls on evaporator fans in existing cooler/freezer.
Savings Equation	Gross kWh = kW_Fan × %OFF × (Hours per year) × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) + [kW_cp × Hours_cp + kW_fan × (Hours per year) × (1-%OFF)] × %SAVE Gross kW = Gross kWh / Hours Where: kW_Fan = Power demand of evaporator fan calculated from equipment nameplate data and estimated 0.55 power factor/adjustment %OFF_heater = Door heater Off time: 46% for freezer door heaters or 74% for cooler door heaters 8760 Hours per year = Conversion factor 1.6 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3,413 Btu/hr per kW = Conversion factor 12 kBtu/hr per ton = Conversion factor kW_cp = Total power demand of compressor motor and condenser fan calculated from equipment nameplate data and estimated 0.85 power factor Hours_cp = Equivalent annual full load hours of compressor operation; Estimate based on NRM field experience. %OFF_evap = Percent of annual hours that the evaporator is turned off; Estimate based on NRM field experience. %SAVE = Reduced run-time of compressor and evaporator due to electronic controls; Estimate based on NRM field experience.
Hours	4072
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Calculation assumptions based off of NRM field experience and data
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0

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measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.58
RRe source	HEC, Inc. (1996). Analysis of Savings from Walkiin Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSco.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	HEC, Inc. (1996). Analysis of Savings from Walkiin Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSco.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	HEC, Inc. (1996). Analysis of Savings from Walkiin Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSco.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.23
CF summer peak source	HEC, Inc. (1995). Analysis of Door Master Walk-In Cooler Anti-Sweat Door Heater Controls Installed at 10 Sites in MA. Prepared for NEPSCo; Table 9.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.84
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC026
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Novelty Cooler Control
Program Name	Direct Install
Measure Name	Novelty cooler shutoff
Measure Description	Installation of controls to shut off a facility's novelty coolers for non-perishable goods based on pre-programmed store hours. Energy savings occur as coolers cycle off during facility unoccupied hours.
Baseline Description	The baseline efficiency case is the novelty coolers operating 8,760 hours per year.
Savings Principle	The high efficiency case is the novelty coolers operating fewer than 8,760 hours per year since they are controlled to cycle each night based on pre-programmed facility unoccupied hours.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed controls on existing cooler/freezer.
Savings Equation	Gross kWh = kW_nc × DC_nc × HoursOff Gross kW = 0 Where: kW_nc = Power demand of novelty cooler calculated from equipment nameplate data and estimated 0.85 power factor. DC_nc = Weighted average annual duty cycle; Estimate based on NRM field experience. HoursOff = Potential hours off every night per year, estimated as one less than the number of hours the store is closed per day: site-specific.
Hours	0
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC027
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Direct Install
Measure Name	Glass front refrigerated coolers
Measure Description	Controls can significantly reduce the energy consumption of vending machine lighting and refrigeration systems. Qualifying controls must power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1208
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.138
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC028
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Direct Install
Measure Name	Non-refrigerated snack vending machine
Measure Description	Controls significantly reduce the energy consumption of vending machine lighting by powering down lighting during periods of inactivity. This measure applies to non-refrigerated snack vending machines. This measure does not apply to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency non-refrigerated snack vending machine without a control system capable of powering down lighting during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency non-refrigerated snack vending machine with a control system capable of powering down lighting during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	343
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.039
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC029
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Direct Install
Measure Name	Refrigerated beverage vending machine
Measure Description	Controls significantly reduce the energy consumption of refrigerated beverage vending machine lighting and refrigeration systems by powering down these systems during periods of inactivity while maintaining a refrigerated product. This measure applies to refrigerated beverage vending machines and glass front refrigerated coolers. This measure does not apply to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1612
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.184
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC033
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Motors
Sub-type	ECM
Program Name	Direct Install
Measure Name	ECM evaporator fan motors (walk–in coolers/ freezers)
Measure Description	Installation of electronically commutated motors (ECMs) in multi-deck and freestanding coolers and freezers, typically on the retail floor of convenience stores, liquor stores, and grocery stores.
Baseline Description	The baseline efficiency case is the existing case motor.
Savings Principle	The high efficiency case is the replacement of the existing case motor with an ECM.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed electronically commutated motor for evaporator fans in existing cooler/freezer.
Savings Equation	Gross kWh = kW_Fan × LRF × Hours × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours Where: kW_Fan = Power demand of evaporator fan calculated from equipment nameplate data and estimated 0.55 power factor/adjustment LRF = Load reduction factor for motor replacement Hours = Annual fan operating hours: site-specific 1.6 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	0.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.87
CF summer peak source	RLW Analytics (2007). Impact Evaluation Analysis of the 2005 Custom SBS Program. Prepared for National Grid. Derivation based on site specific results from the study adjusted for current on peak hours.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.51
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC034
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Refrigeration
Type	Refrigeration Lighting
Sub-type	Refrigerator Case LED
Program Name	Direct Install
Measure Name	LEDs for freezer/cooler cases
Measure Description	Installation of LED lighting in freezer and/or cooler cases. The LED lighting consumes less energy, and results in less waste heat which reduces the cooling/freezing load.
Baseline Description	The baseline efficiency case is the existing lighting fixtures in the cooler or freezer cases.
Savings Principle	The high efficiency case is the installation of LED lighting fixtures on the cooler or freezer cases, replacing the existing lighting fixtures.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed lighting project.
Savings Equation	Gross kWh = [SUM(QTY_base × Watts_base × Hours_base) - SUM(QTY_ee × kW_ee × Hours_ee)] × (1 + EffRefrig × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours_ee Where: QTY_base = Quantity of baseline lighting fixtures in cooler/freezer case Watts_base = Connected wattage of baseline lighting fixtures in cooler/freezer case Hours_base = Annual operating hours of baseline lighting fixtures in cooler/freezer case QTY_ee = Quantity of efficient lighting fixtures in cooler/freezer case Watts_ee = Connected wattage of efficient lighting fixtures in cooler/freezer case Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case 1.9 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.04
RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.07
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.15
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors set to 1.00 since gross kW is the average kW reduction during operation.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC035
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Direct Install
Measure Name	Faucet Aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow.
Baseline Description	The baseline efficiency case is a 2.2 GPM faucet.
Savings Principle	The high efficiency is a low-flow faucet aerator.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	387.4
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.07
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	5460.00
Sewer savings: gallons/yr	5460.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC036
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Spray Valve
Program Name	Direct Install
Measure Name	Pre-Rinse Spray Valve
Measure Description	Retrofitting existing standard spray nozzles in locations where service water is supplied by an electric hot water heater with new low flow pre-rinse spray nozzles with an average flow rate of 1.6 GPM.
Baseline Description	Standard spray valve.
Savings Principle	The high efficiency case is a low flow pre-rinse spray valve with an average flow rate of 1.6 GPM.
Energy Savings calculation method	Deemed
Savings unit	Installed pre-rinse spray valve.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	2871.4
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.75
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Veritec Consulting (2005). Region of Waterloo Pre-Rinse Spray Valve Pilot Study.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	6410.00
Sewer savings: gallons/yr	6410.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC037
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Direct Install
Measure Name	Low-Flow Showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less in a commercial setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is a 2.5 GPM showerhead.
Savings Principle	The high efficiency case is a 1.5 GPM showerhead.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1185
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.2
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	7300.00
Sewer savings: gallons/yr	7300.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC038
Fuel	Electric
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Spray Valve
Program Name	Direct Install
Measure Name	Salon Nozzle
Measure Description	The installation of a high efficiency low flow salon nozzle.
Baseline Description	Standard salon nozzle.
Savings Principle	An efficient low flow salon nozzle.
Energy Savings calculation method	Deemed
Savings unit	Installed salon nozzle
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	4648.9
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.79
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	28639.00
Sewer savings: gallons/yr	28639.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.01
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.76
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.53 /kWh

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TRM Reference Number	RIEC039
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Codes and Standards
Type	Codes and Standards
Sub-type	Codes and Standards
Program Name	Commercial New Construction
Measure Name	CODES AND STANDARDS
Measure Description	Energy efficiency code trainings and advocacy work to improve energy efficiency of buildings and equipment within Rhode Island.
Baseline Description	Un-influenced adoption curve of federal minimum codes and standards.
Savings Principle	Accelerated adoption of advancing energy codes and equipment standards.
Energy Savings calculation method	Calculated based on attribution study
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	KEMA Rhode Island Energy Code Compliance Baseline Study
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	KEMA Rhode Island Energy Code Compliance Baseline Study
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC044
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	High Efficiency Air Compressors
Sub-type	Variable Displacement
Program Name	Commercial New Construction
Measure Name	Variable Displacement (50<=HP<=75)
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Displacement capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	The baseline efficiency case is a typical load / unload compressor.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Displacement capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.19
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC045
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	High Efficiency Air Compressors
Sub-type	Variable Speed Drive
Program Name	Commercial New Construction
Measure Name	VSD (15<=HP<25)
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Speed Drive capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	The baseline efficiency case is a typical load / unload compressor.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Speed Drive capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.19
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC046
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	High Efficiency Air Compressors
Sub-type	Variable Speed Drive
Program Name	Commercial New Construction
Measure Name	VSD (25<=HP<=75)
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Speed Drive capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	The baseline efficiency case is a typical load / unload compressor.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Speed Drive capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.19
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC047
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Low Pressure Drop Filters
Sub-type	Low Pressure Drop Filter
Program Name	Commercial New Construction
Measure Name	Low pressure drop filter
Measure Description	Filters remove solids and aerosols from compressed air systems. Low pressure drop filters have longer lives and lower pressure drops than traditional coalescing filters resulting in higher efficiencies.
Baseline Description	The baseline efficiency case is a standard coalescing filter with initial drop of between 1 and 2 pounds per sq inch (psi) with an end of life drop of 10 psi.
Savings Principle	The high efficiency case is a low pressure drop filter with initial drop not exceeding 1 psi when new and 3 psi at element change. Filters must be deep-bed, “mist eliminator” style and installed on a single operating compressor rated 15 – 75 HP.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed filter.
Savings Equation	Gross kWh = Qty × HP_compressor × (kW per HP) × %SAVE × Hours Gross kW = Qty × HP_compressor × (kW per HP) × %SAVE Where: Qty = Number of filters installed: site-specific HP_compressor = Average compressor load: site-specific kW per HP = Conversion factor %SAVE = Percent change in pressure drop: site-specific Hours = Annual operating hours of the lower pressure drop filter: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	Based on NSTAR estimates of typical replacement schedule
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.80
CF summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.54
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC048
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Refrigerated Air Dryers
Sub-type	Refrigerated Air Dryer
Program Name	Commercial New Construction
Measure Name	Dryer (100<=CFM<200)
Measure Description	The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryer. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.
Baseline Description	The baseline efficiency case is a non-cycling refrigerated air dryer.
Savings Principle	The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per CFM of installed air dryer capacity.
Savings Equation	Gross kWh = CFM_dryer × deltakW/CFM × Hours Gross kW = CFM_dryer × deltakW/CFM Where: CFM_dryer = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM), typically obtained from equipment's Compressed Air Gas Institute Datasheet: site-specific deltakW/CFM = Refrigerated air dryer kW reduction per dryer full flow rated CFM Hours = Annual operating hours of the refrigerated air dryer: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.00558
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.56
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC049
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Refrigerated Air Dryers
Sub-type	Refrigerated Air Dryer
Program Name	Commercial New Construction
Measure Name	Dryer (200<=CFM<300)
Measure Description	The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryer. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.
Baseline Description	The baseline efficiency case is a non-cycling refrigerated air dryer.
Savings Principle	The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per CFM of installed air dryer capacity.
Savings Equation	Gross kWh = CFM_dryer × deltakW/CFM × Hours Gross kW = CFM_dryer × deltakW/CFM Where: CFM_dryer = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM), typically obtained from equipment's Compressed Air Gas Institute Datasheet: site-specific deltakW/CFM = Refrigerated air dryer kW reduction per dryer full flow rated CFM Hours = Annual operating hours of the refrigerated air dryer: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.00558
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.56
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC050
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Refrigerated Air Dryers
Sub-type	Refrigerated Air Dryer
Program Name	Commercial New Construction
Measure Name	Dryer (300<=CFM<400)
Measure Description	The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryer. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.
Baseline Description	The baseline efficiency case is a non-cycling refrigerated air dryer.
Savings Principle	The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per CFM of installed air dryer capacity.
Savings Equation	Gross kWh = CFM_dryer × deltakW/CFM × Hours Gross kW = CFM_dryer × deltakW/CFM Where: CFM_dryer = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM), typically obtained from equipment's Compressed Air Gas Institute Datasheet: site-specific deltakW/CFM = Refrigerated air dryer kW reduction per dryer full flow rated CFM Hours = Annual operating hours of the refrigerated air dryer: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.00558
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.56
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC051
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Refrigerated Air Dryers
Sub-type	Refrigerated Air Dryer
Program Name	Commercial New Construction
Measure Name	Dryer (CFM >=400)
Measure Description	The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryer. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.
Baseline Description	The baseline efficiency case is a non-cycling refrigerated air dryer.
Savings Principle	The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per CFM of installed air dryer capacity.
Savings Equation	Gross kWh = CFM_dryer × deltakW/CFM × Hours Gross kW = CFM_dryer × deltakW/CFM Where: CFM_dryer = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM), typically obtained from equipment's Compressed Air Gas Institute Datasheet: site-specific deltakW/CFM = Refrigerated air dryer kW reduction per dryer full flow rated CFM Hours = Annual operating hours of the refrigerated air dryer: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.00558
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.56
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC052
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Refrigerated Air Dryers
Sub-type	Refrigerated Air Dryer
Program Name	Commercial New Construction
Measure Name	Dryer (CFM<100)
Measure Description	The installation of cycling or variable frequency drive (VFD)-equipped refrigerated compressed air dryer. An efficient refrigerated dryer cycles on and off or uses a variable speed drive as required by the demand for compressed air instead of running continuously. Only properly sized refrigerated air dryers used in a single-compressor system are eligible.
Baseline Description	The baseline efficiency case is a non-cycling refrigerated air dryer.
Savings Principle	The high efficiency case is a cycling refrigerated dryer or a refrigerated dryer equipped with a VFD.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per CFM of installed air dryer capacity.
Savings Equation	Gross kWh = CFM_dryer × deltakW/CFM × Hours Gross kW = CFM_dryer × deltakW/CFM Where: CFM_dryer = Full flow rated capacity of the refrigerated air dryer in cubic feet per minute (CFM), typically obtained from equipment's Compressed Air Gas Institute Datasheet: site-specific deltakW/CFM = Refrigerated air dryer kW reduction per dryer full flow rated CFM Hours = Annual operating hours of the refrigerated air dryer: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.00558
kW reduction source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.56
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC053
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Compressed Air
Type	Zero Loss Condensate Drains
Sub-type	Zero Loss Condensate Drain
Program Name	Commercial New Construction
Measure Name	Zero loss condensate drain
Measure Description	Drains remove water from a compressed air system. Zero loss condensate drains remove water from a compressed air system without venting any air, resulting in less air demand and consequently greater efficiency.
Baseline Description	The baseline efficiency case is the installation of a standard condensate drain on a compressor system.
Savings Principle	The high efficiency case is the installation of a zero loss condensate drain on a single operating compressor rated <= 75 HP.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed drain.
Savings Equation	Gross kWh = CFM_pipe × deltaCFM/CFM_pipe × deltakW/CFM × Hours Gross kW = CFM_pipe × deltaCFM/CFM_pipe × deltakW/CFM Where: CFM_pipe = CFM capacity of piping: site-specific 0.049 deltaCFM/CFM_pipe = Average CFM saved per CFM of piping capacity 0.24386 deltakW/CFM = Average demand savings per CFM; Based on regional analysis assuming a typical timed drain settings discharge scenario. Hours = Annual operating hours of the zero loss condensate drain: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.80
CF summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.54
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.04
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC065
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Custom
Type	HVAC
Sub-type	HVAC
Program Name	Commercial New Construction
Measure Name	Custom HVAC
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.75

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RRe source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRe note	#N/A
RR demand (RRd) summer peak	0.58
RRd summer peak source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.66
RRd winter peak source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.33
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.67
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.32
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC070
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Lighting
Sub-type	Lighting
Program Name	Commercial New Construction
Measure Name	Custom lighting
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.92

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RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.11
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.79
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.33
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.67
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.32
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC080
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Fryer
Program Name	Commercial New Construction
Measure Name	Commercial Electric Fryer
Measure Description	Installation of a qualified ENERGY STAR® commercial fryer, which saves energy during preheating, cooking, and idling.
Baseline Description	The baseline efficiency case is a deep-fat fryer with a cooking efficiency of 75%, a shortening capacity of up to 65 pounds, daily a preheat energy of 2.3 kWh, and an idle energy rate of 1.05 kW
Savings Principle	The high efficiency case is a deep-fat fryer with a cooking energy efficiency of 80%, a shortening capacity of up to 65 pounds, a daily preheat energy of 2.3 kWh, and an idle energy rate of 1.05 kW.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency electric fryer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	3756
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	760
kWh/yr savings source	ENERGYSTAR Commercial Kitchen Equipment Savings Calculator: Fryer Calculations. www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/CalculatorConsumerRoomAC.xls.
kWh/yr savings note	#N/A
kW reduction	0.202
kW reduction source	ENERGYSTAR Commercial Kitchen Equipment Savings Calculator: Fryer Calculations. www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/CalculatorConsumerRoomAC.xls.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Pacific Gas & Electric Company – Customer Energy Efficiency Department (2007). Work Paper PGECOFST101, Commercial Convection Oven, Revision #0.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	All PAs use 100% savings persistence factors.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100%
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100%
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are .9 for both summer and winter seasons to account for restaurants that close one day per week or may not serve lunch and dinner on weekdays.
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIEC081
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Griddle
Program Name	Commercial New Construction
Measure Name	Commercial electric griddle
Measure Description	Installation of a qualified ENERGY STAR® griddle. ENERGY STAR® griddles save energy during preheat, cooking and idle times due to improved cooking efficiency, and preheat and idle energy rates.
Baseline Description	The baseline efficiency case is a standard efficiency (30% efficient) griddle.
Savings Principle	The high efficiency case is a griddle with an efficiency of 38%.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency commercial electric griddle.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	3756
Hours Source	Technical Assessment of Commercial Ovens <http://www.fishnick.com/equipment/techassessment/7_ovens.pdf>, pg.23
Hours source note	#N/A
kWh/yr Savings	2226
kWh/yr savings source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kWh/yr savings note	#N/A
kW reduction	0.593
kW reduction source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2011). Electric Griddle Life-Cycle Cost Calculator. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are .9 for both summer and winter seasons to account for restaurants that close one day per week or may not serve lunch and dinner on weekdays.
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIEC082
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Commercial Electric Convection Oven
Measure Description	Installation of a qualified ENERGY STAR® commercial oven. ENERGY STAR® commercial ovens save energy during preheat, cooking and idle times due to improved cooking efficiency, and preheat and idle energy rates.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15 of Appendix A.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15 of Appendix A.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency commercial electric oven.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	3756
Hours Source	Technical Assessment of Commercial Ovens <http://www.fishnick.com/equipment/techassessment/7_ovens.pdf>, pg.23
Hours source note	#N/A
kWh/yr Savings	1364
kWh/yr savings source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kWh/yr savings note	#N/A
kW reduction	0.436
kW reduction source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Pacific Gas & Electric Company – Customer Energy Efficiency Department (2007). Work Paper PGECOFST101, Commercial Convection Oven, Revision #0.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are .9 for both summer and winter seasons to account for restaurants that close one day per week or may not serve lunch and dinner on weekdays.
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIEC083
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Commercial electric oven
Measure Description	Installation of a qualified ENERGY STAR® commercial oven. ENERGY STAR® commercial ovens save energy during preheat, cooking and idle times due to improved cooking efficiency, and preheat and idle energy rates.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15 of Appendix A.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15 of Appendix A.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency commercial electric oven.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	3756
Hours Source	Technical Assessment of Commercial Ovens <http://www.fishnick.com/equipment/techassessment/7_ovens.pdf>, pg.23
Hours source note	#N/A
kWh/yr Savings	9688
kWh/yr savings source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kWh/yr savings note	#N/A
kW reduction	2.579
kW reduction source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Pacific Gas & Electric Company – Customer Energy Efficiency Department (2007). Work Paper PGECOFST101, Commercial Convection Oven, Revision #0.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are .9 for both summer and winter seasons to account for restaurants that close one day per week or may not serve lunch and dinner on weekdays.
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIEC084
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Steamer
Program Name	Commercial New Construction
Measure Name	Commercial electric steamer
Measure Description	Installation of a qualified ENERGY STAR® commercial steam cooker. ENERGY STAR® steam cookers save energy during cooling and idle times due to improved cooking efficiency and idle energy rates.
Baseline Description	The baseline efficiency case is a conventional electric steam cooker with a cooking energy efficiency of 30%, pan production capacity of 23.3 pounds per hour, and an idle energy rate of 1.2 kW.
Savings Principle	The high efficiency case is an ENERGY STAR® electric steam cooker with a cooking energy efficiency of 50%, pan production capacity of 16.7 pounds per hour, and an idle energy rate of 0.4 kW.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency commercial electric steamer.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	3756
Hours Source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
Hours source note	#N/A
kWh/yr Savings	8381
kWh/yr savings source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kWh/yr savings note	#N/A
kW reduction	2.231
kW reduction source	ENERGY Star Commercial Kitchen Equipment Savings Calculator: Griddle Calculations <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Environmental Protection Agency (2011). Savings Calculator for ENERGY Star Qualified Commercial Kitchen Equipment: Steam Cooker Calcs. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.90
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are .9 for both summer and winter seasons to account for restaurants that close one day per week or may not serve lunch and dinner on weekdays.
Coincidence factor (CF) winter peak	0.90
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIEC085
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	High Temp, Door Type
Program Name	Commercial New Construction
Measure Name	Dishwasher - High Temperature Door Type
Measure Description	Installation of a qualified ENERGY STAR® high temperature commercial dishwasher in a building with gas domestic hot water. High temperature dishwashers use a booster heater to raise the rinse water temperature to 1800 F – hot enough to sterilize dishes and assist in drying. Electric savings are achieved through savings to the electric booster.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 0.87 kW idle energy rate and 1.29 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 0.70 kW idle energy rate and 0.89 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	4151
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.74
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	35000.00
Sewer savings: gallons/yr	35000.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC086
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	High Temp, Single Tank
Program Name	Commercial New Construction
Measure Name	Dishwasher - High Temperature Single Tank Conveyor
Measure Description	Installation of a qualified ENERGY STAR® high temperature commercial dishwasher in a building with gas domestic hot water. High temperature dishwashers use a booster heater to raise the rinse water temperature to 1800 F – hot enough to sterilize dishes and assist in drying. Electric savings are achieved through savings to the electric booster.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 1.93 kW idle energy rate and 0.87 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 1.50 kW idle energy rate and 0.70 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	4243
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.75
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	21300.00
Sewer savings: gallons/yr	21300.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC087
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	High Temp, Under Counter
Program Name	Commercial New Construction
Measure Name	Dishwasher - High Temperature Under Counter
Measure Description	Installation of a qualified ENERGY STAR® high temperature commercial dishwasher in a building with gas domestic hot water. High temperature dishwashers use a booster heater to raise the rinse water temperature to 1800 F – hot enough to sterilize dishes and assist in drying. Electric savings are achieved through savings to the electric booster.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 0.76 kW idle energy rate and 1.09 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 0.50 kW idle energy rate and 0.86 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1791
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.32
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	5400.00
Sewer savings: gallons/yr	5400.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC088
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	Low Temp, Door Type
Program Name	Commercial New Construction
Measure Name	Dishwasher - Low Temperature Door Type
Measure Description	Installation of a qualified ENERGY STAR® low temperature commercial dishwasher in a facility with electric hot water heating. Low temperature dishwashers use the hot water supplied by the kitchen's existing water heater and use a chemical sanitizing agent in the final rinse cycle and sometimes a drying agent.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 0.60 kW idle energy rate and 2.10 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 0.60 kW idle energy rate and 1.18 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	13851
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	2.46
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	80600.00
Sewer savings: gallons/yr	80600.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC089
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	Low Temp, Single tank
Program Name	Commercial New Construction
Measure Name	Dishwasher - Low Temperature Single Tank Conveyor
Measure Description	Installation of a qualified ENERGY STAR® low temperature commercial dishwasher in a facility with electric hot water heating. Low temperature dishwashers use the hot water supplied by the kitchen's existing water heater and use a chemical sanitizing agent in the final rinse cycle and sometimes a drying agent.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 1.60 kW idle energy rate and 1.31 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 1.60 kW idle energy rate and 0.79 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	11685
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	2.07
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	65100.00
Sewer savings: gallons/yr	65100.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC090
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Dishwasher
Sub-type	Low Temp, Under Counter
Program Name	Commercial New Construction
Measure Name	Dishwasher - Low Temperature Under Counter
Measure Description	Installation of a qualified ENERGY STAR® low temperature commercial dishwasher in a facility with electric hot water heating. Low temperature dishwashers use the hot water supplied by the kitchen's existing water heater and use a chemical sanitizing agent in the final rinse cycle and sometimes a drying agent.
Baseline Description	The baseline efficiency case is a commercial dishwasher with 0.50 kW idle energy rate and 1.73 gal/rack water consumption.
Savings Principle	The high efficiency case is a commercial dishwasher with 0.50 kW idle energy rate and 1.19 gal/rack water consumption or lower following ENERGY STAR efficiency requirements.
Energy Savings calculation method	Deemed
Savings unit	Installed Dishwasher
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	2178
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.39
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	12700.00
Sewer savings: gallons/yr	12700.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Dishwasher Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC091
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Hot Food Cabinet
Sub-type	1/2
Program Name	Commercial New Construction
Measure Name	Hot Food Holding Cabinet - 1/2
Measure Description	Installation of a qualified ENERGY STAR® hot food holding cabinet (HFHC).
Baseline Description	The baseline efficiency idle energy rate for a HFHC is 400 W for all sizes.
Savings Principle	A HFHC that incorporates better insulation, reducing heat loss, and may also offer additional energy saving devices such as magnetic door gaskets, auto-door closures, or dutch doors. 1/2 size idle energy rate is 172 W.
Energy Savings calculation method	Deemed
Savings unit	Per hot food cabinet
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	4695
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	695
kWh/yr savings source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.15
kW reduction source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC092
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Hot Food Cabinet
Sub-type	3/4
Program Name	Commercial New Construction
Measure Name	Hot Food Holding Cabinet - 3/4
Measure Description	Installation of a qualified ENERGY STAR® hot food holding cabinet (HFHC).
Baseline Description	The baseline efficiency idle energy rate for a HFHC is 400 W for all sizes.
Savings Principle	A HFHC that incorporates better insulation, reducing heat loss, and may also offer additional energy saving devices such as magnetic door gaskets, auto-door closures, or dutch doors. 3/4 size idle energy rate is 258 W.
Energy Savings calculation method	Deemed
Savings unit	Per hot food cabinet
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	4695
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1042
kWh/yr savings source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.22
kW reduction source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC093
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Hot Food Cabinet
Sub-type	Full
Program Name	Commercial New Construction
Measure Name	Hot Food Holding Cabinet - Full
Measure Description	Installation of a qualified ENERGY STAR® hot food holding cabinet (HFHC).
Baseline Description	The baseline efficiency idle energy rate for a HFHC is 400 W for all sizes.
Savings Principle	A HFHC that incorporates better insulation, reducing heat loss, and may also offer additional energy saving devices such as magnetic door gaskets, auto-door closures, or dutch doors. Full size idle energy rate is 294 W.
Energy Savings calculation method	Deemed
Savings unit	Per hot food cabinet
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	4695
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	2376
kWh/yr savings source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.51
kW reduction source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	ENERGY STAR® Commercial Kitchen Equipment Savings Calculator: HFHC Calcs. <http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/commercial_kitchen_equipment_calculator.xls>. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC094
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Ice Machine
Sub-type	Ice Making Head
Program Name	Commercial New Construction
Measure Name	Ice Making Head
Measure Description	Installation of a qualified ENERGY STAR® commercial ice machine.
Baseline Description	The baseline efficiency case is a non-ENERGY STAR® commercial ice machine.
Savings Principle	Commercial ice machines meeting the ENERGY STAR® specifications are on average 15 percent more energy efficient and 10 percent more water-efficient than standard models.
Energy Savings calculation method	Deemed
Savings unit	Per ice machine
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	665
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.08
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3322.00
Sewer savings: gallons/yr	3322.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC095
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Ice Machine
Sub-type	Ice Remote/Split
Program Name	Commercial New Construction
Measure Name	Ice Remote/Split
Measure Description	Installation of a qualified ENERGY STAR® commercial ice machine.
Baseline Description	The baseline efficiency case is a non-ENERGY STAR® commercial ice machine.
Savings Principle	Commercial ice machines meeting the ENERGY STAR® specifications are on average 15 percent more energy efficient and 10 percent more water-efficient than standard models.
Energy Savings calculation method	Deemed
Savings unit	Per ice machine
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1196
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.14
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC096
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Ice Machine
Sub-type	Ice Self Contained
Program Name	Commercial New Construction
Measure Name	Ice Self Contained
Measure Description	Installation of a qualified ENERGY STAR® commercial ice machine.
Baseline Description	The baseline efficiency case is a non-ENERGY STAR® commercial ice machine.
Savings Principle	Commercial ice machines meeting the ENERGY STAR® specifications are on average 15 percent more energy efficient and 10 percent more water-efficient than standard models.
Energy Savings calculation method	Deemed
Savings unit	Per ice machine
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakWh / Hours Where: Qty = Total number of units. deltakWh = Deemed average annual kWh reduction per unit. Hours = Deemed average annual operating hours.
Hours	5634
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	205
kWh/yr savings source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kWh/yr savings note	#N/A
kW reduction	0.02
kW reduction source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	In-service rates are set to 100% based on the assumption that all purchased units are installed.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rates are 100% since savings estimates are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3526.00
Sewer savings: gallons/yr	3526.00
Water / Sewer savings Source	Savings Calculator for ENERGY STAR® Certified Commercial Kitchen Equipment: Ice Machine Calcs. <http://www.energystar.gov/buildings/sites/default/uploads/files/commercial_kitchen_equipment_calculator.xlsx >. Tool downloaded August 10, 2015.
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIEC133
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Controls
Sub-type	Economizer
Program Name	Commercial New Construction
Measure Name	Dual enthalpy economizer controls
Measure Description	The measure is to upgrade the outside-air dry-bulb economizer to a dual enthalpy economizer. The system will continuously monitor the enthalpy of both the outside air and return air. The system will control the system dampers adjust the outside quantity based on the two readings.
Baseline Description	The baseline efficiency case for this measure assumes the relevant HVAC equipment is operating with a fixed dry-bulb economizer.
Savings Principle	The high efficiency case is the installation of an outside air economizer utilizing two enthalpy sensors, one for outdoor air and one for return air.
Energy Savings calculation method	Deemed
Savings unit	Total tons of controlled cooling capacity.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	289
kWh/yr savings source	Patel, Dinesh (2001). Energy Analysis: Dual Enthalpy Control. Prepared for NSTAR.
kWh/yr savings note	#N/A
kW reduction	0.289
kW reduction source	Patel, Dinesh (2001). Energy Analysis: Dual Enthalpy Control. Prepared for NSTAR.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.05
RRe source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.

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RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.34
CF summer peak source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC134
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Ground Source
Program Name	Commercial New Construction
Measure Name	Ground source (closed loop) heat pump
Measure Description	This measure applies to the installation of high-efficiency single package or split system air source, water source, ground source (closed loop) and groundwater source (open loop) heat pump systems for space conditioning applications.
Baseline Description	The baseline efficiency case for new installations assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code.
Savings Principle	The high efficiency case assumes a high-efficiency air cooled, water source, ground water source, or ground source heat pump system that exceeds the energy efficiency requirements of the International Energy Conservation Code (IECC) 2015.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed heat pump system for space cooling / heating.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × [(1/SEER_base - 1/SEER_ee) × Hours_C + CR × (1/HSPF_base - 1/HSPF_ee) × Hours_H] Gross kW = Tons × (kBtu/hr per ton) × (1/EER_base - 1/EER_ee) Where: Tons = Rated cooling capacity of the installed equipment: site-specific. 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of the baseline equipment: code SEER_ee = Seasonal energy efficiency ratio of the high-efficiency unit: site-specific. Hours_C = Equivalent full load cooling hours HSPF_base = Heating Seasonal Performance Factor for baseline equipment: code HSPF_ee = Heating Seasonal Performance Factor for new efficient equipment: site-specific. Hours_H = Equivalent full load heating hours CR = Capacity Ratio converts rated cooling capacity to heating capacity. For equipment with cooling capacity ≤ 5.4 tons, assume CR=1. For equipment > 5.4 tons, assume CR=1.15; Optimal Energy, Inc. (2008). Memo:Non-Electric Benefits Analysis Update. Prepared for Dave Weber, NSTAR. EER_base = Energy Efficiency Ratio of baseline equipment. EER_ee = Energy Efficiency Ratio of the new efficient equipment: site-specific. For equipment < 5.4 tons, assume the following conversion: EER≈SEER/1.1
Hours	0
Hours Source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15

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measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.05
RRe source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.40
CF summer peak source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC135
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Ground Source
Program Name	Commercial New Construction
Measure Name	Water source heat pump
Measure Description	This measure applies to the installation of high-efficiency single package or split system air source, water source, ground source (closed loop) and groundwater source (open loop) heat pump systems for space conditioning applications.
Baseline Description	The baseline efficiency case for new installations assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code.
Savings Principle	The high efficiency case assumes a high-efficiency air cooled, water source, ground water source, or ground source heat pump system that exceeds the energy efficiency requirements of the International Energy Conservation Code (IECC) 2015.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed heat pump system for space cooling / heating.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × [(1/SEER_base - 1/SEER_ee) × Hours_C + CR × (1/HSPF_base - 1/HSPF_ee) × Hours_H] Gross kW = Tons × (kBtu/hr per ton) × (1/EER_base - 1/EER_ee) Where: Tons = Rated cooling capacity of the installed equipment: site-specific. 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of the baseline equipment: code SEER_ee = Seasonal energy efficiency ratio of the high-efficiency unit: site-specific. Hours_C = Equivalent full load cooling hours HSPF_base = Heating Seasonal Performance Factor for baseline equipment: code HSPF_ee = Heating Seasonal Performance Factor for new efficient equipment: site-specific. Hours_H = Equivalent full load heating hours CR = Capacity Ratio converts rated cooling capacity to heating capacity. For equipment with cooling capacity ≤ 5.4 tons, assume CR=1. For equipment > 5.4 tons, assume CR=1.15; Optimal Energy, Inc. (2008). Memo:Non-Electric Benefits Analysis Update. Prepared for Dave Weber, NSTAR. EER_base = Energy Efficiency Ratio of baseline equipment. EER_ee = Energy Efficiency Ratio of the new efficient equipment: site-specific. For equipment < 5.4 tons, assume the following conversion: EER≈SEER/1.1
Hours	0
Hours Source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15

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measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.05
RRe source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.40
CF summer peak source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC136
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heat Pumps
Sub-type	Groundwater Source
Program Name	Commercial New Construction
Measure Name	Groundwater source (open loop) heat pump
Measure Description	This measure applies to the installation of high-efficiency single package or split system air source, water source, ground source (closed loop) and groundwater source (open loop) heat pump systems for space conditioning applications.
Baseline Description	The baseline efficiency case for new installations assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code.
Savings Principle	The high efficiency case assumes a high-efficiency air cooled, water source, ground water source, or ground source heat pump system that exceeds the energy efficiency requirements of the International Energy Conservation Code (IECC) 2015.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed heat pump system for space cooling / heating.
Savings Equation	Gross kWh = Tons × (kBtu/hr per ton) × [(1/SEER_base - 1/SEER_ee) × Hours_C + CR × (1/HSPF_base - 1/HSPF_ee) × Hours_H] Gross kW = Tons × (kBtu/hr per ton) × (1/EER_base - 1/EER_ee) Where: Tons = Rated cooling capacity of the installed equipment: site-specific. 12 kBtu/hr per ton = Conversion factor SEER_base = Seasonal Energy Efficiency Ratio of the baseline equipment: code SEER_ee = Seasonal energy efficiency ratio of the high-efficiency unit: site-specific. Hours_C = Equivalent full load cooling hours HSPF_base = Heating Seasonal Performance Factor for baseline equipment: code HSPF_ee = Heating Seasonal Performance Factor for new efficient equipment: site-specific. Hours_H = Equivalent full load heating hours CR = Capacity Ratio converts rated cooling capacity to heating capacity. For equipment with cooling capacity ≤ 5.4 tons, assume CR=1. For equipment > 5.4 tons, assume CR=1.15; Optimal Energy, Inc. (2008). Memo:Non-Electric Benefits Analysis Update. Prepared for Dave Weber, NSTAR. EER_base = Energy Efficiency Ratio of baseline equipment. EER_ee = Energy Efficiency Ratio of the new efficient equipment: site-specific. For equipment < 5.4 tons, assume the following conversion: EER≈SEER/1.1
Hours	0
Hours Source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15

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measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.05
RRe source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 2, Energy Efficient HVAC and Process Cooling Equipment. Prepared for NE Power Service Co.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.40
CF summer peak source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC137
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Motors
Sub-type	ECM Motor
Program Name	Commercial New Construction
Measure Name	ECM fan motor for HVAC
Measure Description	This measure is offered through the Cool Choice program and promotes the installation of electronically commutated motors (ECMs) on fan powered terminal boxes, fan coils, and HVAC supply fans on small unitary equipment.
Baseline Description	The baseline efficiency case for this measure assumes the VAV box fans are powered by a single speed fractional horsepower permanent split capacitor (PSC) induction motor.
Savings Principle	The high efficiency case must have a motor installed on new, qualifying HVAC equipment.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed ECM fan motor.
Savings Equation	Gross kWh = DesignCFM × BoxSizeFactor × %Flow_Annual × Hours Gross Summer kW = DesignCFM × BoxSizeFactor × %Flow_Summer × Hours Gross Winter kW = DesignCFM × BoxSizeFactor × %Flow_Winter × Hours Where: DesignCFM = Capacity of the VAV box in cubic feet per minute: site-specific. BoxSizeFactor = Savings factor in Watts/CFM %Flow_Annual = Average % of design flow over all operating hours %Flow_Summer = Average % of design flow during summer peak period %Flow_Winter = Average % of design flow during winter peak period Hours = Estimated annual operating hours for VAV box fans: site-specific. DesignCFM = Capacity of the VAV box in cubic feet per minute: site-specific. Hours = Estimated annual operating hours for VAV box fans: site-specific.
Hours	0
Hours Source	KEMA (2011). C&I Unitary HVAC Load Shape Project Final Report. Prepared for the Regional Evaluation, Measurement and Verification Forum.
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC143
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Ventilation
Sub-type	Demand Control Ventilation
Program Name	Commercial New Construction
Measure Name	Demand control ventilation
Measure Description	The measure is to control quantity of outside air to an air handling system based on detected space CO2 levels. The installed systems monitor the CO2 in the spaces or return air and reduce the outside air use when possible to save energy while meeting indoor air quality standards.
Baseline Description	The baseline efficiency case for this measure assumes the relevant HVAC equipment has no ventilation control.
Savings Principle	The high efficiency case is the installation of an outside air intake control based on CO2 sensors.
Energy Savings calculation method	Custom
Savings unit	Installed demand control ventilation project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = Gross kWh × deltaMMBtu_Gas/kWh Gross MMBtu Oil = Gross kWh × deltaMMBtu_Oil/kWh deltaMMBtu_Gas/kWh = Deemed average natural gas impact per gross electric energy impact deltaMMBtu_Oil/kWh = Deemed average heating oil impact per gross electric energy impact
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Calculated with the National Grid DCV savings Tool
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because energy savings are custom calculated.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because energy savings are custom calculated.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to 1.00 because coincidence is built into the estimates of Gross kW.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC153
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Lighting
Type	Controls
Sub-type	Dimming
Program Name	Commercial New Construction
Measure Name	Daylight dimming
Measure Description	This measure promotes the installation of lighting controls in both lost-opportunity and retrofit applications. Promoted technologies include occupancy sensors and daylight dimming controls.
Baseline Description	The baseline efficiency case assumes no controls (retrofit) or code-compliant controls (new construction).
Savings Principle	The high efficiency case involves lighting fixtures connected to controls that reduce the pre-retrofit or baseline hours of operation.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed lighting controls project.
Savings Equation	Gross kWh = SUM[QTY_i × Watts_i × (Hours_base_i - Hours_ee_i)] / (Watts per kW) Gross kW = SUM(QTY_i × Watts_i) / (Watts per kW) Where: QTY_i = Quantity in controlled fixtures in location i Watts_i = Connected wattage of controlled fixtures in location i Hours_base_i = Total annual hours that the connected lighting in location i operated without controls (for retrofit installations) or would have operated with code-compliance controls (for new construction installations). Hours_ee_i = Total annual hours that the connected lighting in location i operates with the lighting controls implemented. 1,000 Watts per kW = Conversion factor deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.38
RRe source	RLW Analytics (2007). Lighting Controls Impact Evaluation Final Report, 2005 Energy Initiative, Design 2000plus and Small Business Services Program. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	0.96
RRd summer peak source	RLW Analytics (2007). Lighting Controls Impact Evaluation Final Report, 2005 Energy Initiative, Design 2000plus and Small Business Services Program. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.96
RRd winter peak source	RLW Analytics (2007). Lighting Controls Impact Evaluation Final Report, 2005 Energy Initiative, Design 2000plus and Small Business Services Program. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.15
CF summer peak source	RLW Analytics (2007). Lighting Controls Impact Evaluation Final Report, 2005 Energy Initiative, Design 2000plus and Small Business Services Program. Prepared for National Grid.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.02
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.27
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.20 /kWh

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TRM Reference Number	RIEC154
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Lighting
Type	Controls
Sub-type	Occupancy Sensor
Program Name	Commercial New Construction
Measure Name	Occupancy sensors
Measure Description	This measure promotes the installation of lighting controls in both lost-opportunity and retrofit applications. Promoted technologies include occupancy sensors and daylight dimming controls.
Baseline Description	The baseline efficiency case assumes no controls (retrofit) or code-compliant controls (new construction).
Savings Principle	The high efficiency case involves lighting fixtures connected to controls that reduce the pre-retrofit or baseline hours of operation.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed lighting controls project.
Savings Equation	Gross kWh = SUM[QTY_i × Watts_i × (Hours_base_i - Hours_ee_i)] / (Watts per kW) Gross kW = SUM(QTY_i × Watts_i) / (Watts per kW) Where: QTY_i = Quantity in controlled fixtures in location i Watts_i = Connected wattage of controlled fixtures in location i Hours_base_i = Total annual hours that the connected lighting in location i operated without controls (for retrofit installations) or would have operated with code-compliance controls (for new construction installations). Hours_ee_i = Total annual hours that the connected lighting in location i operates with the lighting controls implemented. 1,000 Watts per kW = Conversion factor deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.68
RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRe note	#N/A
RR demand (RRd) summer peak	0.96
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.96
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.15
CF summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.02
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.27
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.20 /kWh

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TRM Reference Number	RIEC158
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Lighting
Type	Exterior
Sub-type	Street Lighting
Program Name	Commercial New Construction
Measure Name	LED Street Lights
Measure Description	The installation of LED street lights.
Baseline Description	The baseline case is customer owned high-pressure sodium, incandescent, or mercury vapor street lighting.
Savings Principle	The high efficiency case is the installation of LED street lighting.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed LED Streetlight
Savings Equation	Gross kWh = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) × Hours Gross kW = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: QTY_base_i = Quantity of baseline fixtures in location i Watts_base_i = Connected wattage of baseline fixtures in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j 1,000 Watts per kW = Conversion factor Hours = Lighting annual hours of operation: site-specific. deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	#N/A
measure life note	Based on National Grid Staff estimates
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Calc
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	Calc
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.27
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.20 /kWh

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TRM Reference Number	RIEC165
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Lighting
Type	LEDs
Sub-type	LED Performance
Program Name	Commercial New Construction
Measure Name	LED Performance lighting
Measure Description	Advanced lighting design refers to the implementation of various lighting design principles aimed at creating a quality and appropriate lighting experience while reducing unnecessary light usage. This is often done by a professional in a new construction situation. Advanced lighting design uses techniques like maximizing task lighting and efficient fixtures to create a system of optimal energy efficiency and functionality.
Baseline Description	The baseline efficiency assumes compliance with lighting power density requirements as mandated by Rhode Island State Building Code. Energy efficiency must be met via compliance with the International Energy Conservation Code (IECC) 2012, as described in Appendix A Table 1 and Table 2.
Savings Principle	The high efficiency case assumes lighting systems with lighting power densities below those required by Rhode Island State Building Code. Installed lighting wattage should be determined using the installed fixture counts and wattages.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed lighting fixture project.
Savings Equation	Gross kWh = [SUM(LPD_base_i × Area_i × Hours_i) - SUM(QTY_ee_j × Watts_ee_j × Hours_j)] / (Watts per kW) Gross kW = [SUM(LPD_base_i × Area_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: Area_i = Floor area of location i (SQFT) Hours_base_i = Total annual operating hours for baseline lighting equipment in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j Hours_j = Lighting annual hours of operation: site-specific. 1,000 Watts per kW = Conversion factor deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A

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In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.07
RRe source	KEMA (2009). National Grid USA 2008 Custom Lighting Impact Evaluation, Final Report. Prepared for National Grid. KEMA (2009). // Sample Design and Impact Evaluation Analysis of the 2008 Custom Program. Prepared for National Grid; Table 19.
RRe note	#N/A
RR demand (RRd) summer peak	0.80
RRd summer peak source	KEMA (2009). National Grid USA 2008 Custom Lighting Impact Evaluation, Final Report. Prepared for National Grid. KEMA (2009). // Sample Design and Impact Evaluation Analysis of the 2008 Custom Program. Prepared for National Grid; Table 19.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.73
RRd winter peak source	KEMA (2009). National Grid USA 2008 Custom Lighting Impact Evaluation, Final Report. Prepared for National Grid. KEMA (2009). // Sample Design and Impact Evaluation Analysis of the 2008 Custom Program. Prepared for National Grid; Table 19.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.02
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.27
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.20 /kWh

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TRM Reference Number	RIEC202
Fuel	Electric
Sector	C&I
Project Type	New Construction
Category	Refrigeration
Type	Refrigeration Lighting
Sub-type	Refrigerator Case LED
Program Name	Commercial New Construction
Measure Name	LEDs for freezer/cooler cases
Measure Description	Installation of LED lighting in freezer and/or cooler cases. The LED lighting consumes less energy, and results in less waste heat which reduces the cooling/freezing load.
Baseline Description	The baseline efficiency case is the existing lighting fixtures in the cooler or freezer cases.
Savings Principle	The high efficiency case is the installation of LED lighting fixtures on the cooler or freezer cases, replacing the existing lighting fixtures.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed lighting project.
Savings Equation	Gross kWh = [SUM(QTY_base × Watts_base × Hours_base) - SUM(QTY_ee × kW_ee × Hours_ee)] × (1 + EffRefrig × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours_ee Where: QTY_base = Quantity of baseline lighting fixtures in cooler/freezer case Watts_base = Connected wattage of baseline lighting fixtures in cooler/freezer case Hours_base = Annual operating hours of baseline lighting fixtures in cooler/freezer case QTY_ee = Quantity of efficient lighting fixtures in cooler/freezer case Watts_ee = Connected wattage of efficient lighting fixtures in cooler/freezer case Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case 1.9 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.94
RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.01
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.01
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.02
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per kWh
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.27
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.20 /kWh

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TRM Reference Number	RIEC205
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Compressed Air
Type	Compressor
Sub-type	Variable compressor up to 25 HP
Program Name	Commercial Retrofit
Measure Name	Variable compressor up to 25 HP
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Displacement capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Displacement capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorithm Input kwh/horsepower based on NSTAR metering analysis and supported by multiple 3rd part impact evaluations
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC206
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Compressed Air
Type	Compressor
Sub-type	Variable compressor up to 75 HP
Program Name	Commercial Retrofit
Measure Name	Variable compressor up to 75 HP
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Displacement capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Displacement capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorithm Input kwh/horsepower based on NSTAR metering analysis and supported by multiple 3rd part impact evaluations
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC207
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Compressed Air
Type	Compressor
Sub-type	VSD compressor up to 75 HP
Program Name	Commercial Retrofit
Measure Name	VSD compressor up to 75 HP
Measure Description	The installation of oil flooded, rotary screw compressors with Variable Speed Drive capacity control schemes to improve compression efficiencies at partial loads, including a properly sized air receiver.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is an oil-flooded, rotary screw compressor with Variable Speed Drive capacity control with a properly sized air receiver.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	kW saved per horsepower (hp) of installed air compressor capacity.
Savings Equation	Gross kWh = HP_compressor × deltakW/HP × Hours Gross kW = HP_compressor × deltakW/HP HP_compressor = Nominal rated horsepower of high efficiency air compressor: site-specific Hours = Annual operating hours of the air compressor: site-specific deltakW/HP = Air compressor kW reduction per HP
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorithm Input kwh/horsepower based on NSTAR metering analysis and supported by multiple 3rd part impact evaluations
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.41
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.05
CF summer peak source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.83
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC209
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Compressed Air
Type	Drain
Sub-type	Zero Loss Drain
Program Name	Commercial Retrofit
Measure Name	Zero Loss Drain
Measure Description	Drains remove water from a compressed air system. Zero loss condensate drains remove water from a compressed air system without venting any air, resulting in less air demand and consequently greater efficiency.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is the installation of a zero loss condensate drain on a single operating compressor rated <= 75 HP.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed drain.
Savings Equation	Gross kWh = CFM_pipe × deltaCFM/CFM_pipe × deltakW/CFM × Hours Gross kW = CFM_pipe × deltaCFM/CFM_pipe × deltakW/CFM Where: CFM_pipe = CFM capacity of piping: site-specific 0.049 deltaCFM/CFM_pipe = Average CFM saved per CFM of piping capacity 0.24386 deltakW/CFM = Average demand savings per CFM; Based on regional analysis assuming a typical timed drain settings discharge scenario. Hours = Annual operating hours of the zero loss condensate drain: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations
RRe note	#N/A
RR demand (RRd) summer peak	1.00

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RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.80
CF summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.54
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC210
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Compressed Air
Type	Filter
Sub-type	Low pressure drop filter
Program Name	Commercial Retrofit
Measure Name	Low pressure drop filter
Measure Description	Filters remove solids and aerosols from compressed air systems. Low pressure drop filters have longer lives and lower pressure drops than traditional coalescing filters resulting in higher efficiencies.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is a low pressure drop filter with initial drop not exceeding 1 psi when new and 3 psi at element change. Filters must be deep-bed, “mist eliminator” style and installed on a single operating compressor rated 15 – 75 HP.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed filter.
Savings Equation	Gross kWh = Qty × HP_compressor × (kW per HP) × %SAVE × Hours Gross kW = Qty × HP_compressor × (kW per HP) × %SAVE Where: Qty = Number of filters installed: site-specific HP_compressor = Average compressor load: site-specific kW per HP = Conversion factor %SAVE = Percent change in pressure drop: site-specific Hours = Annual operating hours of the lower pressure drop filter: site-specific
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorithm Input kwh/horsepower based on NSTAR metering analysis and supported by multiple 3rd part impact evaluations
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	KEMA (2016) Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations

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RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.80
CF summer peak source	DMI (2006). Impact Evaluation of 2004 Compressed Air Prescriptive Rebates. Prepared for National Grid. Results analyzed in RLW Analytics (2006). Sample Design and Impact Evaluation.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.54
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.14
Net-to-Gross	0.72
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.43
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC211
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	CHP
Sub-type	CHP
Program Name	Commercial Retrofit
Measure Name	Custom CHP
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.95
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.52
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.26 /kWh

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TRM Reference Number	RIEC212
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Compressed Air
Sub-type	Compressed Air
Program Name	Commercial Retrofit
Measure Name	Custom Compressed Air
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.93
RRe source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRe note	#N/A

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RR demand (RRd) summer peak	1.00
RRd summer peak source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.04
RRd winter peak source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC216
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	HVAC
Sub-type	HVAC
Program Name	Commercial Retrofit
Measure Name	Custom HVAC
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.75

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RRe source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRe note	#N/A
RR demand (RRd) summer peak	0.58
RRd summer peak source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.66
RRd winter peak source	DNV GL (2015) Impact Evaluation of 2012 Custom HVAC Installations (MAEEAC)
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC218
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Lighting
Sub-type	Lighting
Program Name	Commercial Retrofit
Measure Name	Custom lighting
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.92

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RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.11
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.79
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Custom Lighting Installations. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC220
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Motor
Sub-type	Motor
Program Name	Commercial Retrofit
Measure Name	Custom Motor
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRe note	#N/A

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RR demand (RRd) summer peak	1.14
RRd summer peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.17
RRd winter peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC222
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Other
Sub-type	Other
Program Name	Commercial Retrofit
Measure Name	Custom Other
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRe note	#N/A

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RR demand (RRd) summer peak	1.14
RRd summer peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.17
RRd winter peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC223
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Process
Sub-type	Process
Program Name	Commercial Retrofit
Measure Name	Custom process
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.93

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RRe source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.04
RRd winter peak source	KEMA (2010). Sample Design and Impact Evaluation Analysis of 2009 Custom Program. Prepared for National Grid; Table 17.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC243
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Energy Management System
Program Name	Commercial Retrofit
Measure Name	Energy management system
Measure Description	The measure is the installation of a new building energy management system (EMS) or the expansion of an existing energy management system for control of non-lighting electric and gas end-uses in an existing building on existing equipment.
Baseline Description	The baseline case is the existing equipment and systems without the implemented controls.
Savings Principle	The high efficiency case is the installation of a new EMS or the expansion of an existing EMS to control additional non-lighting electric and/or gas equipment. The EMS must be installed in an existing building on existing equipment.
Energy Savings calculation method	Custom
Savings unit	Upgrade to existing energy management system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = Gross kWh × deltaMMBtu_Gas/kWh Gross MMBtu Oil = Gross kWh × deltaMMBtu_Oil/kWh deltaMMBtu_Gas/kWh = Deemed average natural gas impact per gross electric energy impact deltaMMBtu_Oil/kWh = Deemed average heating oil impact per gross electric energy impact
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.04
RRe source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 3, Energy Management Control Systems. Prepared for NE Power Service Co.
RRe note	#N/A

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RR demand (RRd) summer peak	1.03
RRd summer peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 3, Energy Management Control Systems. Prepared for NE Power Service Co.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.03
RRd winter peak source	The Fleming Group (1994). Persistence of Commercial/Industrial Non-Lighting Measures, Volume 3, Energy Management Control Systems. Prepared for NE Power Service Co.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC245
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Occupancy Sensor
Program Name	Commercial Retrofit
Measure Name	Hotel occupancy sensor
Measure Description	The measure is to the installation of hotel occupancy sensors (HOS) to control packaged terminal AC units (PTACs) with electric heat, heat pump units and/or fan coil units in hotels that operate all 12 months of the year.
Baseline Description	The baseline efficiency case assumes the equipment has no occupancy based controls.
Savings Principle	The high efficiency case is the installation of controls that include (a) occupancy sensors, (b) window/door switches for rooms that have operable window or patio doors, and (c) set back to 65 degrees Fahrenheit in the heating mode and set forward to 78 F in the cooling mode when occupancy detector is in the unoccupied mode. Sensors controlled by a front desk system are not eligible.
Energy Savings calculation method	Deemed
Savings unit	Installed hotel occupancy sensor.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	438
kWh/yr savings source	National Grid and NSTAR (2010). Energy Analysis: Hotel Guest Occupancy Sensors.
kWh/yr savings note	#N/A
kW reduction	0.09
kW reduction source	National Grid and NSTAR (2010). Energy Analysis: Hotel Guest Occupancy Sensors.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.30
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.70
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.64
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.32 /kWh

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TRM Reference Number	RIEC249
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Lighting
Type	Controls
Sub-type	Occupancy Sensor
Program Name	Commercial Retrofit
Measure Name	Occupancy sensors
Measure Description	This measure promotes the installation of lighting controls in both lost-opportunity and retrofit applications. Promoted technologies include occupancy sensors and daylight dimming controls.
Baseline Description	The baseline efficiency case assumes no controls (retrofit) or code-compliant controls (new construction).
Savings Principle	The high efficiency case involves lighting fixtures connected to controls that reduce the pre-retrofit or baseline hours of operation.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed lighting controls project.
Savings Equation	Gross kWh = SUM[QTY_i × Watts_i × (Hours_base_i - Hours_ee_i)] / (Watts per kW) Gross kW = SUM(QTY_i × Watts_i) / (Watts per kW) Where: QTY_i = Quantity in controlled fixtures in location i Watts_i = Connected wattage of controlled fixtures in location i Hours_base_i = Total annual hours that the connected lighting in location i operated without controls (for retrofit installations) or would have operated with code-compliance controls (for new construction installations). Hours_ee_i = Total annual hours that the connected lighting in location i operates with the lighting controls implemented. 1,000 Watts per kW = Conversion factor deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.68
RRe source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRe note	#N/A
RR demand (RRd) summer peak	0.96
RRd summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.96
RRd winter peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.15
CF summer peak source	KEMA (2013). Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.18
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.46
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.232 /kWh

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TRM Reference Number	RIEC262
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Lighting
Type	Street Lights
Sub-type	Street lighting
Program Name	Commercial Retrofit
Measure Name	Street Lighting
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) × Hours Gross kW = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: QTY_base_i = Quantity of baseline fixtures in location i Watts_base_i = Connected wattage of baseline fixtures in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j 1,000 Watts per kW = Conversion factor Hours = Lighting annual hours of operation: site-specific. deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	NEEP DOE LED Street Lighting Assessment and Strategies for the Northeast and Mid-Atlantic
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.46
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.232 /kWh

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TRM Reference Number	RIEC263
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Lighting
Type	Street Lights
Sub-type	Street lighting w/controls
Program Name	Commercial Retrofit
Measure Name	Street Lighting with controls
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) × Hours Gross kW = [SUM(QTY_base_i × Watts_base_i) - SUM(QTY_ee_j × Watts_ee_j)] / (Watts per kW) Where: QTY_base_i = Quantity of baseline fixtures in location i Watts_base_i = Connected wattage of baseline fixtures in location i QTY_ee_j = Quantity of efficient fixtures in location j Watts_ee_j = Connected wattage of efficient fixtures in location j 1,000 Watts per kW = Conversion factor Hours = Lighting annual hours of operation: site-specific. deltaMMBtu_Gas/kWh = Gross natural gas MMBtu reduction per gross kWh saved. deltaMMBtu_Oil/kWh = Gross heating oil MMBtu reduction per gross kWh saved.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	NEEP DOE LED Street Lighting Assessment and Strategies for the Northeast and Mid-Atlantic
measure life note	#N/A
In-service rate (ISR)	1.00

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In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.46
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.232 /kWh

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TRM Reference Number	RIEC307
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Defrost Control
Program Name	Commercial Retrofit
Measure Name	Defrost control
Measure Description	A control mechanism to skip defrost cycles when defrost is unnecessary.
Baseline Description	The baseline efficiency case is an evaporator fan electric defrost system that uses a time clock mechanism to initiate defrost.
Savings Principle	The high efficiency case is an evaporator fan defrost system with electric defrost controls.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed defrost controls in existing cooler/freezer.
Savings Equation	Gross kWh = kW_Defrost × DRF × Hours × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours Where: kW_Defrost = Load of electric defrost: site-specific DRF = Defrost reduction factor- percent reduction in defrosts required per year: 35% Hours = Number of hours defrost occurs over a year without the defrost controls 1.6 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12 kBtu/hr per ton = Conversion factor
Hours	The number of defrost cycles is estimated to decrease by 35% from an average number of defrost cycles of 1460 defrosts/year at 40 minutes each for a total of 973 hours/year. The number of defrost cycles with the defrost controls is 949 cycles/year, or 633
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors set to 1.00 since gross kW is the average kW reduction during operation.
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC308
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Door Heater Control
Program Name	Commercial Retrofit
Measure Name	Door heater control
Measure Description	The Installation of controls to reduce the run time of door and frame heaters for freezers and walk-in or reach-in coolers. The reduced heating results in a reduced cooling load.
Baseline Description	The baseline efficiency case is a cooler or freezer door heater that operates 8,760 hours per year without any controls.
Savings Principle	The high efficiency case is a cooler or freezer door heater connected to a heater control system, which controls the door heaters by measuring the ambient humidity and temperature of the store, calculating the dew point, and using pulse width modulation (PWM) to control the anti-sweat heater based on specific algorithms for freezer and cooler doors. Door temperature is typically maintained about 5 degrees Fahrenheit above the store air dew point temperature with the heaters operating at 80% (adjustable).
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed door heater controls on existing cooler/freezer.
Savings Equation	Gross kWh = kW_DoorHeater × %OFF × Hours Gross kW = kW_DoorHeater × %OFF Where: kW_DoorHeater = Total demand of the door heater, calculated as Volts * Amps / 1000: site-specific %OFF = Door heater Off time: 46% for freezer door heaters or 74% for cooler door heaters Hours = Door heater annual run hours before controls
Hours	Pre-retrofit hours are 8,760 hours per year. After controls are installed, the door heaters in freezers are on for an average 4,730.4 hours/year (46% off time) and the door heaters for coolers are on for an average 2,277.6 hours/year (74% off time).
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.

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Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed 100% because savings are based on researched assumptions.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.50
CF summer peak source	HEC, Inc. (1995). Analysis of Door Master Walk-In Cooler Anti-Sweat Door Heater Controls Installed at 10 Sites in MA. Prepared for NEPSCo; Table 9.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC309
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Fan Control
Program Name	Commercial Retrofit
Measure Name	Evaporator fan control
Measure Description	Installation of controls to modulate the evaporator fans based on temperature control. Energy savings include: fan energy savings from reduced fan operating hours, refrigeration energy savings from reduced waste heat, and compressor energy savings resulting from the electronic temperature control. Electronic controls allow less fluctuation in temperature, thereby creating savings.
Baseline Description	The baseline efficiency case assumes evaporator fans that run 8760 annual hours with no temperature control.
Savings Principle	The high efficiency case is the use of an energy management system to control evaporator fan operation based on temperature.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed controls on evaporator fans in existing cooler/freezer.
Savings Equation	Gross kWh = kW_Fan × %OFF × (Hours per year) × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) + [kW_cp × Hours_cp + kW_fan × (Hours per year) × (1-%OFF)] × %SAVE Gross kW = Gross kWh / Hours Where: kW_Fan = Power demand of evaporator fan calculated from equipment nameplate data and estimated 0.55 power factor/adjustment %OFF_heater = Door heater Off time: 46% for freezer door heaters or 74% for cooler door heaters 8760 Hours per year = Conversion factor 1.6 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3,413 Btu/hr per kW = Conversion factor 12 kBtu/hr per ton = Conversion factor kW_cp = Total power demand of compressor motor and condenser fan calculated from equipment nameplate data and estimated 0.85 power factor Hours_cp = Equivalent annual full load hours of compressor operation; Estimate based on NRM field experience. %OFF_evap = Percent of annual hours that the evaporator is turned off; Estimate based on NRM field experience. %SAVE = Reduced run-time of compressor and evaporator due to electronic controls; Estimate based on NRM field experience.
Hours	4072
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0

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Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.58
RRe source	HEC, Inc. (1996). Analysis of Savings from Walk-In Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSCo.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	HEC, Inc. (1996). Analysis of Savings from Walk-In Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSCo.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	HEC, Inc. (1996). Analysis of Savings from Walk-In Cooler Air Economizers and Evaporator Fan Controls. Prepared for NEPSCo.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.23
CF summer peak source	HEC, Inc. (1995). Analysis of Door Master Walk-In Cooler Anti-Sweat Door Heater Controls Installed at 10 Sites in MA. Prepared for NEPSCo; Table 9.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.84
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC310
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Novelty Cooler Control
Program Name	Commercial Retrofit
Measure Name	Novelty cooler shutoff
Measure Description	Installation of controls to shut off a facility's novelty coolers for non-perishable goods based on pre-programmed store hours. Energy savings occur as coolers cycle off during facility unoccupied hours.
Baseline Description	The baseline efficiency case is the novelty coolers operating 8,760 hours per year.
Savings Principle	The high efficiency case is the novelty coolers operating fewer than 8,760 hours per year since they are controlled to cycle each night based on pre-programmed facility unoccupied hours.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed controls on existing cooler/freezer.
Savings Equation	Gross kWh = kW_nc × DC_nc × HoursOff Gross kW = 0 Where: kW_nc = Power demand of novelty cooler calculated from equipment nameplate data and estimated 0.85 power factor. DC_nc = Weighted average annual duty cycle; Estimate based on NRM field experience. HoursOff = Potential hours off every night per year, estimated as one less than the number of hours the store is closed per day: site-specific.
Hours	Energy and demand savings are based on the reduced operation hours of the cooler equipment. Hours reduced per day are estimated on a case-by-case basis, and are typically calculated as one less than the number of hours per day that the facility is closed
Hours Source	#N/A
Hours source note	#VALUE!
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A

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Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC311
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Commercial Retrofit
Measure Name	Glass front refrigerated coolers
Measure Description	Controls can significantly reduce the energy consumption of vending machine lighting and refrigeration systems. Qualifying controls must power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1208
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.138
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC312
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Commercial Retrofit
Measure Name	Non-refrigerated snack vending machine
Measure Description	Controls can significantly reduce the energy consumption of vending machine lighting and refrigeration systems. Qualifying controls must power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	343
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.039
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	National Grid assumption based on regional PA working groups. Assumptions based on historical steam trap surveys. Steam losses in lbs/hr are found using “Boiler Efficiency Institute (1987). Steam Efficiency Improvement; Page 34, Table 4.1 under Steam Leak
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A

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In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC313
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Controls
Sub-type	Vending Miser
Program Name	Commercial Retrofit
Measure Name	Refrigerated beverage vending machine
Measure Description	Controls can significantly reduce the energy consumption of vending machine lighting and refrigeration systems. Qualifying controls must power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR® qualified vending machines, as they already have built-in controls.
Baseline Description	The baseline efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler without a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Savings Principle	The high efficiency case is a standard efficiency refrigerated beverage vending machine, non-refrigerated snack vending machine, or glass front refrigerated cooler with a control system capable of powering down lighting and refrigeration systems during periods of inactivity.
Energy Savings calculation method	Deemed
Savings unit	Installed vending miser.
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Where: Qty = Total number of units. Delta kWh = Deemed average annual kWh reduction per unit. Delta kW = Deemed average kW reduction per unit.
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	1612
kWh/yr savings source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kWh/yr savings note	#N/A
kW reduction	0.184
kW reduction source	USA Technologies Energy Management Product Sheets (2006). Accessed on 09/01/2009.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC316
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Custom
Sub-type	Refrigeration
Program Name	Commercial Retrofit
Measure Name	Custom Refrigeration
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	Defined per project.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRe note	#N/A

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RR demand (RRd) summer peak	1.14
RRd summer peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.17
RRd winter peak source	DNV GL (2014) impact Evaluation of Rhode Island Custom Refrigeration, Motor, and Other Measures
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIEC317
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Motors
Sub-type	ECM
Program Name	Commercial Retrofit
Measure Name	Case ECMs
Measure Description	Installation of various sizes of electronically commutated motors (ECMs) in walk-in coolers and freezers to replace existing evaporator fan motors.
Baseline Description	The baseline efficiency case is an existing case motor.
Savings Principle	The high efficiency case is the replacement of an existing case with an ECM.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed electronically commutated motor for evaporator fans in existing cooler/freezer.
Savings Equation	Gross kWh = kW_motor × LRF × Hours × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours Where: kW_motor = Metered load of existing case motor: site-specific LRF = Load reduction factor: 53% when shaded pole motors are replaced, 29% when PSC motors are replaced Hours = Average runtime of case motors; Estimate based on NRM field experience. RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor
Hours	Hours are the annual operating hours of the case motors.
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.87
CF summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.51
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC318
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Motors
Sub-type	ECM
Program Name	Commercial Retrofit
Measure Name	ECM Evaporator fan Motors for Walk-in coolers
Measure Description	Installation of electronically commutated motors (ECMs) in multi-deck and freestanding coolers and freezers, typically on the retail floor of convenience stores, liquor stores, and grocery stores.
Baseline Description	The baseline efficiency case is the existing case motor.
Savings Principle	The high efficiency case is the replacement of the existing case motor with an ECM.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Installed electronically commutated motor for evaporator fans in existing cooler/freezer.
Savings Equation	Gross kWh = kW_Fan × LRF × Hours × (1 + RefrigEff × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours Where: kW_Fan = Power demand of evaporator fan calculated from equipment nameplate data and estimated 0.55 power factor/adjustment LRF = Load reduction factor for motor replacement Hours = Annual fan operating hours: site-specific 1.6 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor
Hours	The annual operating hours are assumed to be 8,760 * (1-%OFF), where %OFF = 0 if the facility does not have evaporator fan controls or %OFF > 0 if the facility has evaporator fan controls. See section: Refrigeration – Evaporator Fan Controls for %OFF valu
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	Algorith Inputs are based field experience and evaluation from National Resource Management. Supported by Select Energy (2004). Cooler Control Measure Impact Spreadsheet User's Manual. Prepared for NSTAR.
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.87
CF summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.51
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC319
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Refrigeration Lighting
Sub-type	Refrigerator Case LED
Program Name	Commercial Retrofit
Measure Name	LEDs for freezer/cooler cases
Measure Description	Installation of LED lighting in freezer and/or cooler cases. The LED lighting consumes less energy, and results in less waste heat which reduces the cooling/freezing load.
Baseline Description	The baseline efficiency case is the existing lighting fixtures in the cooler or freezer cases.
Savings Principle	The high efficiency case is the installation of LED lighting fixtures on the cooler or freezer cases, replacing the existing lighting fixtures.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed lighting project.
Savings Equation	Gross kWh = [SUM(QTY_base × Watts_base × Hours_base) - SUM(QTY_ee × kW_ee × Hours_ee)] × (1 + EffRefrig × (Btu/hr per kW) / (Btu/hr per ton)) Gross kW = Gross kWh / Hours_ee Where: QTY_base = Quantity of baseline lighting fixtures in cooler/freezer case Watts_base = Connected wattage of baseline lighting fixtures in cooler/freezer case Hours_base = Annual operating hours of baseline lighting fixtures in cooler/freezer case QTY_ee = Quantity of efficient lighting fixtures in cooler/freezer case Watts_ee = Connected wattage of efficient lighting fixtures in cooler/freezer case Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case 1.9 RefrigEff = Efficiency of typical refrigeration system (kW/ton); Estimate based on NRM field experience. 3413 Btu/hr per kW = Conversion factor 12,000 Btu/hr per ton = Conversion factor Hours_ee = Annual operating hours of efficient lighting fixtures in cooler/freezer case
Hours	8760
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00

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Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.94
RRe source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	1.01
RRd summer peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.01
RRd winter peak source	RLW Analytics (2007). Small Business Services Custom Measure Impact Evaluation. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are assumed to be 1.0 since exit signs are on 8,760 hours a year
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.46
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.232 /kWh

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TRM Reference Number	RIEC320
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Refrigeration
Type	Temp Maintain
Sub-type	Night Cover
Program Name	Commercial Retrofit
Measure Name	Cooler night cover
Measure Description	Installation of retractable aluminum woven fabric covers for open-type refrigerated display cases, where the covers are deployed during the facility unoccupied hours in order to reduce refrigeration energy consumption.
Baseline Description	The baseline efficiency case is the annual operation of open-display cooler cases.
Savings Principle	The high efficiency case is the use of night covers to protect the exposed area of display cooler cases during unoccupied hours.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Linear feet of installed night covers on existing cooler cases.
Savings Equation	Gross kWh = Width × deltakW/feet × Hours Gross kW = Width × deltakW/feet Where: Width = Width in feet of the opening that the night covers protect: site-specific deltakW/feet = Savings factor based on the temperature of the case Hours = Annual hours that the night covers are in use: site-specific
Hours	Hours represent the number of annual hours that the night covers are in use, and should be determined on a case-by-case basis.
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A

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RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence Factors are set to zero since demand savings typically occur during off-peak hours
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.28
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.79
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.29
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.147 /kWh

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TRM Reference Number	RIEC321
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	BOC Training
Sub-type	Certification
Program Name	Commercial Retrofit
Measure Name	Building operator certification
Measure Description	The Building Operator Certificaiton (BOC) class improves operators' ability to optimize / minimize gas and electricity use in buildings.
Baseline Description	The basecase is a building operator without specific training on efficient use of gas and electricity in buildings.
Savings Principle	The high efficiency case is a building operator attending a class on improving the efficiency of gas and electricity use in buildings.
Energy Savings calculation method	Deemed
Savings unit	kWh/SF/BOC completion
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0.178
kWh/yr savings source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1695.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1250 per measure

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TRM Reference Number	RIEC322
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	BOC Training
Sub-type	Certification + capital improvements
Program Name	Commercial Retrofit
Measure Name	Building operator certification + capital improvements
Measure Description	The Building Operator Certificaiton (BOC) class improves operators' ability to optimize / minimize gas and electricity use in buildings.
Baseline Description	The basecase is a building operator without specific training on efficient use of gas and electricity in buildings.
Savings Principle	The high efficiency case is a building operator attending a class on improving the efficiency of gas and electricity use in buildings, as well as capital investments in EE projects.
Energy Savings calculation method	Deemed
Savings unit	kWh/SF/BOC completion
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0.364
kWh/yr savings source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1695.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1250 per measure

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TRM Reference Number	RIEC324
Fuel	Electric
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	Custom
Sub-type	Whole Building
Program Name	Commercial Retrofit
Measure Name	Comprehensive Retrofit (CR)
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom energy-efficiency project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.20

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RRe source	KEMA (2011). Impact Evaluation of Custom Comprehensive and HVAC Installations. Prepared for National Grid.
RRe note	#N/A
RR demand (RRd) summer peak	0.84
RRd summer peak source	KEMA (2011). Impact Evaluation of Custom Comprehensive and HVAC Installations. Prepared for National Grid.
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.50
RRd winter peak source	KEMA (2011). Impact Evaluation of Custom Comprehensive and HVAC Installations. Prepared for National Grid.
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	For all custom projects, gross summer and winter peak coincidence factors are custom-calculated based on project-specific information. The actual or measured coincidence factors are included in the summer and winter demand realization rates.
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.07
Spill-Over (non-participant)	0.00
Net-to-Gross	0.99
Net-to-Gross source	TetraTech (2014). 2013 Commercial and Industrial Programs Free-ridership and Spillover Study. September, 2014
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 0.24 /kWh

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TRM Reference Number	RIGR001
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	EnergyStar HVAC
Measure Name	Boiler (forced hot water) >= 95% AFUE
Measure Description	Installation of a new space heating gas-fired condensing boiler.
Baseline Description	The baseline efficiency case is a boiler with an AFUE equal to 82%.
Savings Principle	The high efficiency case is a boiler with an AFUE greater than or equal to 90% or 95%.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	14.1
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	19
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	49.11
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	383.53
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.32
Spill-Over (participant)	0.08
Spill-Over (non-participant)	0.00
Net-to-Gross	0.76
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	4044.15
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 700 per measure

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TRM Reference Number	RIGR003
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	EnergyStar HVAC
Measure Name	Boiler (forced hot water) 90% AFUE
Measure Description	Installation of a new space heating gas-fired boiler.
Baseline Description	The baseline efficiency case is a boiler with an AFUE equal to 82%.
Savings Principle	The high efficiency case is a boiler with an AFUE greater than or equal to 90% or 95%.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	11.4
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	49.70
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	385.23
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.32
Spill-Over (participant)	0.08
Spill-Over (non-participant)	0.00
Net-to-Gross	0.76
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIGR011
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	EnergyStar HVAC
Measure Name	Integrated water heater/condensing boiler
Measure Description	This measure promotes the installation of a combined high-efficiency boiler and water heating unit. Combined boiler and water heating systems are more efficient than separate systems because they eliminate the standby heat losses of an additional tank.
Baseline Description	The baseline efficiency case is an 80% AFUE boiler with a 0.594 EF water heater.
Savings Principle	The high efficiency case is an integrated water heater/condensing boiler with a 90% AFUE boiler and a 0.9 EF water heater.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency integrated boiler/water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	10.4
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	2.74
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	19.27
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.34
Spill-Over (participant)	0.08
Spill-Over (non-participant)	0.00
Net-to-Gross	0.74
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1728.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

.

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TRM Reference Number	RIGR014
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	Residential New Construction
Measure Name	Heating_tier1
Measure Description	This measure involves the installation of a high-efficiency natural gas heating system.
Baseline Description	The baseline efficiency case is a standard efficiency natural gas heating system.
Savings Principle	The high efficiency case is the installation of a high-efficiency natural gas heating system.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency natural gas heating system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	189.00
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIGR015
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	Residential New Construction
Measure Name	Heating_tier2
Measure Description	This measure involves the installation of a high-efficiency natural gas heating system.
Baseline Description	The baseline efficiency case is a standard efficiency natural gas heating system.
Savings Principle	The high efficiency case is the installation of a high-efficiency natural gas heating system.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency natural gas heating system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	189.00
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIGR016
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	Residential New Construction
Measure Name	Heating_tier3
Measure Description	This measure involves the installation of a high-efficiency natural gas heating system.
Baseline Description	The baseline efficiency case is a standard efficiency natural gas heating system.
Savings Principle	The high efficiency case is the installation of a high-efficiency natural gas heating system.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency natural gas heating system.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	189.00
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIGR017
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Furnace
Program Name	EnergyStar HVAC
Measure Name	Furnace (forced hot air) >= 97% AFUE
Measure Description	Installation of a new high efficiency space heating gas-fired furnace with an electronically commutated motor (ECM) for the fan.
Baseline Description	The baseline efficiency case is a 85% AFUE (negotiated) furnace.
Savings Principle	The high efficiency case is a new furnace with AFUE >= 95% and an electronically commutated motor or a new furnace with AFUE >= 97% and an electronically commutated motor.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency furnace with ECM
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	9.2
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.16
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	379.29
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.41
Spill-Over (participant)	0.22
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1865.98
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

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TRM Reference Number	RIGR019
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Furnace
Program Name	EnergyStar HVAC
Measure Name	Furnace (forced hot air) 95% AFUE w/ECM
Measure Description	Installation of a new high efficiency space heating gas-fired furnace with an electronically commutated motor (ECM) for the fan.
Baseline Description	The baseline efficiency case is a 85% AFUE (negotiated) furnace.
Savings Principle	The high efficiency case is a new furnace with AFUE >= 95% and an electronically commutated motor or a new furnace with AFUE >= 97% and an electronically commutated motor.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency furnace with ECM
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	8.1
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00

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RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.16
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	379.29
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.41
Spill-Over (participant)	0.22
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	1703.82
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 300 per measure

.

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TRM Reference Number	RIGR025
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	EnergyStar HVAC
Measure Name	Integrated water heater/condensing boiler 95
Measure Description	This measure promotes the installation of a combined condensing high-efficiency boiler and water heating unit. Combined boiler and water heating systems are more efficient than separate systems because they eliminate the standby heat losses of an additional tank.
Baseline Description	The baseline efficiency case is an 80% AFUE boiler with a 0.594 EF water heater.
Savings Principle	The high efficiency case is an integrated water heater/condensing boiler with a 95% AFUE boiler and a 0.95 EF water heater.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency integrated boiler/water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	12.8
Gas Heat MMBtu/yr savings source	Cadmus (2015) High Efficiency Heating Equipment Impact Evaluation
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	2.74
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	19.27
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.34
Spill-Over (participant)	0.08
Spill-Over (non-participant)	0.00
Net-to-Gross	0.74
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	2200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGR026
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Residential New Construction
Measure Name	Hot water heating_tier1
Measure Description	DHW measures including high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR027
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Residential New Construction
Measure Name	Hot water heating_tier2
Measure Description	DHW measures including high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIGR028
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Flow Control
Sub-type	Flow Control Measures
Program Name	Residential New Construction
Measure Name	Hot water heating_tier3
Measure Description	DHW measures including high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	The baseline efficiency case is the existing domestic hot water equipment.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed DHW efficiency measure.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR029
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Residential New Construction
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	10.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 10 per measure

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TRM Reference Number	RIGR030
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Condensing Water Heater
Program Name	EnergyStar HVAC
Measure Name	Condensing Gas Water Heater (THERMAL EFICIENCY 0.95)
Measure Description	Condensing water heaters recover energy by using either a larger heat exchanger or a second heat exchanger to reduce the flue-gas temperature to the point that water vapor condenses, thus releasing even more energy.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a stand-alone storage water heater with an energy factor >= 0.67, a condensing water heater with an energy factor >= 0.95, a tankless water heater with an energy factor >= 0.82, or an indirect water heater attached to an ENERGY STAR® rated forced hot water gas boiler.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.70
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	41.28
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.37
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	Nexus Market Research (2010). HEHE Process and Impact Evaluation. Prepared for GasNetworks
Net-to-Gross note	#N/A
Gross Measure TRC unit	1728.48
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

.

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TRM Reference Number	RIGR033
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Efficient Standard Tank Water Heater
Program Name	EnergyStar HVAC
Measure Name	High Efficiency Stand Alone Water Heater (0.67 EF)
Measure Description	Stand-alone storage water heaters are high efficiency water heaters that are not combined with space heating devices.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a stand-alone storage water heater with an energy factor >= 0.67, a condensing water heater with an energy factor >= 0.95, a tankless water heater with an energy factor >= 0.82, or an indirect water heater attached to an ENERGY STAR® rated forced hot water gas boiler.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	Verifying Thermostatic Valve Showerhead Savings.xls
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.30
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	58.47
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.13
Spill-Over (participant)	0.13
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	562.23
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

.

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TRM Reference Number	RIGR038
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	EnergyStar HVAC
Measure Name	Tankless Water Heaters (EF 0.82)
Measure Description	Tankless water heaters circulate water through a heat exchanger to be heated for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a stand-alone storage water heater with an energy factor >= 0.67, a condensing water heater with an energy factor >= 0.95, a tankless water heater with an energy factor >= 0.82, or an indirect water heater attached to an ENERGY STAR® rated forced hot water gas boiler.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	19
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.23
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	56.39
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.37
Spill-Over (participant)	0.25
Spill-Over (non-participant)	0.00
Net-to-Gross	0.88
Net-to-Gross source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

.

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TRM Reference Number	RIGR041
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	EnergyStar HVAC
Measure Name	Tankless Water Heaters (EF 0.94)
Measure Description	Condensing water tankless water heaters recover energy by using either a larger heat exchanger or a second heat exchanger to reduce the flue-gas temperature to the point that water vapor condenses, thus releasing even more energy and circulating water through a heat exchanger to be heated for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a stand-alone storage water heater with an energy factor >= 0.67, a condensing water heater with an energy factor >= 0.95, a tankless water heater with an energy factor >= 0.82, or an indirect water heater attached to an ENERGY STAR® rated forced hot water gas boiler.
Energy Savings calculation method	Deemed
Savings unit	Installed condensing tankless water heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	1.23
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	56.39
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.25
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.75
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	2077.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 400 per measure

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TRM Reference Number	RIGR042
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Codes and Standards
Sub-type	Codes and Standards
Program Name	Residential New Construction
Measure Name	CODES AND STANDARDS
Measure Description	Energy efficiency code trainings and advocacy work to improve energy efficiency of buildings and equipment within Rhode Island.
Baseline Description	Un-influenced adoption curve of federal minimum codes and standards.
Savings Principle	Accelerated adoption of advancing energy codes and equipment standards.
Energy Savings calculation method	Calculated based on attribution study
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group (2012). Rhode Island 2011 Basline Study of Single-Family Residential New Construction. Prepared for national Grid.
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group (2012). Rhode Island 2011 Basline Study of Single-Family Residential New Construction. Prepared for national Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	11
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR043
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	CP
Measure Description	To capture lost opportunities, encourage the construction of energy-efficient homes, and drive the market to one in which new homes are moving towards net-zero energy.
Baseline Description	The User Defined Reference Home was revised in 2012 as a result of a baseline study.
Savings Principle	The high efficiency case is represented by the specific energy characteristics of each “as-built” home completed through the program.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR044
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Flow Control Measures
Program Name	Residential New Construction
Measure Name	CP-DHW
Measure Description	DHW measures including high-efficiency low-flow showerheads and faucet aerators save water and water heating energy.
Baseline Description	0
Savings Principle	0
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR045
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab CP
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

.

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TRM Reference Number	RIGR046
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab CP-DHW
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR055
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier1
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Calculated, per 100ft2
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

.

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TRM Reference Number	RIGR056
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier2
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Calculated, per 100ft2
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR057
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	Heating
Program Name	Residential New Construction
Measure Name	Renovation Rehab Heating_tier3
Measure Description	The heating savings resulting from Renovation Rehab projects that include the installation of roof, wall, and basement insulation
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Calculated, per 100ft2
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR058
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier1
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR059
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier2
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR060
Fuel	Gas
Sector	Residential
Project Type	New Construction
Category	Whole Home
Type	Custom
Sub-type	DHW
Program Name	Residential New Construction
Measure Name	Renovation Rehab Domestic Hot Water_tier3
Measure Description	The DHW savings resulting from Renovation Rehab projects that include more efficient water heating systems.
Baseline Description	The baseline case is the current version of the RI energy code and/or UDRH performance.
Savings Principle	The efficient case is the post-retrofit performance of a house participating the program
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Complete Renovation Rehab project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
kW reduction note	Supplied by vendor
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	NMR Group, KEMA, The Cadmus Group, Dorothy Conant (2012). Rhode Island 2011 Baseline Study of Single-Family Residential New Construction. Prepared for National Grid.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	Coincidence factors are custom calculated based on project-specific detail.
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	Varies by performance tier, housing type & number of units. See Source for details per housing Unit

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TRM Reference Number	RIGR064
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	Income Eligible MultiFamily
Measure Name	Air Sealing
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross MMBtu Gas = (CFM50_pre - CFM50_post) / LBL × HDD × (Hours per Day) × (Minutes per Hour) × (Btu/ft3-°F) × CorrectionFactor / SeasonalEff / (Btu per MMBtu) Where: CFM50_pre = CFM50 measurement before air sealing CFM50_post = CFM50 measurement after air sealing (cu.ft./min) LBL = LBL factor - This factor is determined as the product of the N-factor and a Height Correction Factor according to BPI Protocol 4644 HDD = Heating degree days (deg. F-day); This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data. http://www.ncdc.noaa.gov 24 Hours per Day = Conversion factor 60 Minutes per Hour = Conversion factor 0.018 Btu/ft3-°F = Heat capacity of 1 cubic foot of air at 70 °F 1 CorrectionFactor = Correction factor determined by auditor (e.g. for seasonal homes): Default 0.7 SeasonalEff = Heating system seasonal efficiency factor determined by auditor for homes heated with natural gas: Default 1,000,000 Btu per MMBtu = Conversion factor
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15

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measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	57.86
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	146.12
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR065
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	EnergyWise MultiFamily
Measure Name	Air Sealing
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross MMBtu Gas = (CFM50_pre - CFM50_post) / LBL × HDD × (Hours per Day) × (Minutes per Hour) × (Btu/ft3-°F) × CorrectionFactor / SeasonalEff / (Btu per MMBtu) Where: CFM50_pre = CFM50 measurement before air sealing CFM50_post = CFM50 measurement after air sealing (cu.ft./min) LBL = LBL factor - This factor is determined as the product of the N-factor and a Height Correction Factor according to BPI Protocol 4644 HDD = Heating degree days (deg. F-day); This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data. http://www.ncdc.noaa.gov 24 Hours per Day = Conversion factor 60 Minutes per Hour = Conversion factor 0.018 Btu/ft3-°F = Heat capacity of 1 cubic foot of air at 70 °F 1 CorrectionFactor = Correction factor determined by auditor (e.g. for seasonal homes): Default 0.7 SeasonalEff = Heating system seasonal efficiency factor determined by auditor for homes heated with natural gas: Default 1,000,000 Btu per MMBtu = Conversion factor
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15

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measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	135.83
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.19
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR066
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	EnergyWise
Measure Name	SF Air Sealing
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Deemed
Savings unit	Completed air sealing project.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	3.22
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	135.83
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR067
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	EnergyWise
Measure Name	SF Air Sealing Kit (Gas)
Measure Description	The installation of recessed lighting cans that provide air sealing benefits.
Baseline Description	The baseline is leaky recessed lighting cans on thermal boundaries.
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST).
Energy Savings calculation method	Deemed
Savings unit	Installed kit
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.39
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Rise Engineering (2015). Memo on Pilot Findings for LED inserts for Recessed Light Cans.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	2.34
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	16.45
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR075
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Other
Program Name	EnergyWise
Measure Name	SF Insulation
Measure Description	Insulation upgrades (other than basement, roofs, and walls) applied in existing facilities.
Baseline Description	The baseline efficiency case is the existing facility or equipment prior to the implementation of additional insulation.
Savings Principle	The high efficiency case is the existing facility or equipment after the implementation of additional insulation.
Energy Savings calculation method	Deemed
Savings unit	Completed insulation project.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	11.69
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	378.05
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR078
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	Income Eligible MultiFamily
Measure Name	Shell Insulation
Measure Description	Insulation upgrades are applied in existing multifamily facilities.
Baseline Description	The baseline efficiency case is characterized by the total R-value of the existing attic, basement or sidewall (Rexisit). This is calculated as the R-value of the existing insulation, estimated by the program contractor, plus the R-value of the ceiling, floor, or wall (for all projects: RCEILING = 3.36; RFLOOR = 6.16; RWALL = 6.65)
Savings Principle	The high efficiency case is characterized by the total R-value of the attic after the installation of additional attic, basement or sidewall insulation. This is calculated as the sum of the existing R-value (RBASE) plus the R-value of the added insulation (RADD).
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	MMBTUannual = (((1/Rexist)-(1/Rnew)) x HDD x 24 x Area) / (1,000,000) X Nheat kWhannual = MMBtuannaul x 293.1 kW = kWhannual x kW/kWhNheating Where: Rexist = Existing effective R-value (R-ExistingInsulation + R-Assembly),ft2-°F/Btuh Rnew = New total effective R-value (R-ProposedMeasure + R-ExistingInsulation + R-Assembly), ft2-°F/Btuh Area = Square footage of insulated area ηheat = Efficiency of the heating system (AFUE or COP) 293.1 = Conversion constant (1MMBtu = 293.1 kWh) 24 = Conversion for hours per day HDD = Heating Degree Days; dependent on location, see table below 1,000,000 = Conversion from Btu to MMBtu kW/kWh heating = Average annual kW reduction per kWh reduction: 0.00050 kW/kWh
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.

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measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	44.26
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	223.63
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR079
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	EnergyWise MultiFamily
Measure Name	MF Shell Insulation
Measure Description	Insulation upgrades are applied in existing multifamily facilities.
Baseline Description	The baseline efficiency case is characterized by the total R-value of the existing attic, basement or sidewall (Rexisit). This is calculated as the R-value of the existing insulation, estimated by the program contractor, plus the R-value of the ceiling, floor, or wall (for all projects: RCEILING = 3.36; RFLOOR = 6.16; RWALL = 6.65)
Savings Principle	The high efficiency case is characterized by the total R-value of the attic after the installation of additional attic, basement or sidewall insulation. This is calculated as the sum of the existing R-value (RBASE) plus the R-value of the added insulation (RADD).
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	MMBTUannual = (((1/Rexist)-(1/Rnew)) x HDD x 24 x Area) / (1,000,000) X Nheat kWhannual = MMBtuannaul x 293.1 kW = kWhannual x kW/kWhNheating Where: Rexist = Existing effective R-value (R-ExistingInsulation + R-Assembly),ft2-°F/Btuh Rnew = New total effective R-value (R-ProposedMeasure + R-ExistingInsulation + R-Assembly), ft2-°F/Btuh Area = Square footage of insulated area ηheat = Efficiency of the heating system (AFUE or COP) 293.1 = Conversion constant (1MMBtu = 293.1 kWh) 24 = Conversion for hours per day HDD = Heating Degree Days; dependent on location, see table below 1,000,000 = Conversion from Btu to MMBtu kW/kWh heating = Average annual kW reduction per kWh reduction: 0.00050 kW/kWh
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25

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measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	378.05
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.19
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR083
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Building Shell
Type	Insulation & Air sealing
Sub-type	Weatherization
Program Name	Single Family Appliance Management
Measure Name	Weatherization
Measure Description	Installation of weatherization measures such as air sealing and insulation in gas heated homes. Electric savings are achieved from reduced run time of the HVAC system fan(s).
Baseline Description	The baseline efficiency case is the existing home shell.
Savings Principle	The high efficiency case can be a combination of increased insulation, air sealing, duct sealing, and other improvements to the home shell.
Energy Savings calculation method	Deemed
Savings unit	Household with weatherization measures installed
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	344
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.009
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	18.8
Gas Heat MMBtu/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.03
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.03
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	128.80
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	368.56
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	4500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4500 per job

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TRM Reference Number	RIGR087
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Custom
Type	Custom
Sub-type	Custom
Program Name	Income Eligible MultiFamily
Measure Name	Custom
Measure Description	Vendors install a variety of measures at multifamily facilities. Measures include
Baseline Description	For retrofit projects, the baseline efficiency case is the same as the existing, or pre-retrofit, case for the
Savings Principle	The high efficiency scenario is specific to the facility and may include one or more energy efficiency
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	0
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	27.81
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR088
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Custom
Type	Custom
Sub-type	Custom
Program Name	EnergyWise MultiFamily
Measure Name	Custom
Measure Description	Vendors install a variety of measures at multifamily facilities. Measures include
Baseline Description	For retrofit projects, the baseline efficiency case is the same as the existing, or pre-retrofit, case for the
Savings Principle	The high efficiency scenario is specific to the facility and may include one or more energy efficiency
Energy Savings calculation method	Calc
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR090
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Boiler Control
Program Name	EnergyStar HVAC
Measure Name	Boiler Reset Controls
Measure Description	Boiler reset controls are devices that improve the efficiency of an existing boiler system by modulating the hot water temperature set point. Reset controls automatically control boiler water temperature based on outdoor temperature using a software program; load controls sense the thermal demand of the heating system and resets the water temperature based on the demand.
Baseline Description	The baseline efficiency case is a boiler without reset or load controls.
Savings Principle	The efficient case is a boiler with reset or load controls, which reset the supply water temperature based on outdoor temperatures and/or building load.
Energy Savings calculation method	Deemed
Savings unit	Installation of boiler reset control on existing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	4.5
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	ACEEE (2006). Emerging Technologies Report: Advanced Boiler Controls. Prepared for ACEEE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	300.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIGR094
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	Programmable thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	1.01
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR095
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise MultiFamily
Measure Name	Programmable thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.24
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.76
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR096
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	Programmable thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	13.54
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	36.34
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR098
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyStar HVAC
Measure Name	WiFi Enabled Thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.6
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00

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RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 50 per measure

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TRM Reference Number	RIGR099
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyStar HVAC
Measure Name	WiFi Enabled Thermostat with Cooling
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	104
kWh/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kWh/yr savings note	#N/A
kW reduction	0.231
kW reduction source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.6
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	1.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	270.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 50 per measure

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TRM Reference Number	RIGR100
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise
Measure Name	WiFi programmable thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.6
Gas Heat MMBtu/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	#N/A
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR101
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	EnergyWise MultiFamily
Measure Name	Wi-Fi programmable thermostat (controls gas heat only)
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR102
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Income Eligible MultiFamily
Measure Name	Wi-Fi Thermostat (controls gas heat only)
Measure Description	A communicating thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling systems Primary Energy Impact: Natural Gas
Baseline Description	The baseline efficiency case is an HVAC system with either a manual or a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a Wi-Fi thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of WiFi programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	4.7
Gas Heat MMBtu/yr savings source	The Cadmus Group (2011). Memo: Wi-fi Programmable Thermostat Billing Analysis. Prepared for Keith Miller and Whitney Domigan, National Grid.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	14.30
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	36.34
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR103
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Sealing
Program Name	EnergyWise MultiFamily
Measure Name	Duct Sealing
Measure Description	Ducts are sealed by reconnecting disconnected duct joints and sealing gaps or seams with mastic and fiber-mesh tape as appropriate
Baseline Description	The baseline efficiency case is the existing facility or equipment prior to the implementation of duct sealing.
Savings Principle	The baseline efficiency case is the existing facility or equipment after the implementation of duct sealing.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	#N/A
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.51
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR104
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Sealing
Program Name	Income Eligible MultiFamily
Measure Name	Duct Sealing
Measure Description	Ducts are sealed by reconnecting disconnected duct joints and sealing gaps or seams with mastic and fiber-mesh tape as appropriate
Baseline Description	The baseline efficiency case is the existing facility or equipment prior to the implementation of duct sealing.
Savings Principle	The baseline efficiency case is the existing facility or equipment after the implementation of duct sealing.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	#N/A
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.20
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	5.11
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR113
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating
Sub-type	Efficient Heating
Program Name	Single Family Appliance Management
Measure Name	Heating system replacement (gas)
Measure Description	Replacement of an existing gas heating system with a new high efficiency system. Electric savings are achieved from reduced run time of the heating system fan(s).
Baseline Description	The baseline efficiency case is the existing inefficient heating equipment.
Savings Principle	The high efficiency case is the new efficient heating equipment.
Energy Savings calculation method	Deemed
Savings unit	Installation of new high-efficiency gas heating system
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	172
kWh/yr savings source	The Cadmus Group (2009). Impact Evaluation of the 2007 Appliance Management Program and Low Income Weatherization Program. Prepared for National Grid.
kWh/yr savings note	#N/A
kW reduction	0.024
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	18.4
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.03
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.03
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	134.82
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	249.20
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	4500.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4500 per measure

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TRM Reference Number	RIGR114
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating System
Sub-type	Retrofit Boiler
Program Name	Income Eligible MultiFamily
Measure Name	Heating System Retrofit, Boiler
Measure Description	Installation of high efficiency heating equipment to replace the existing inefficient furnace, hydronic boiler or steam boiler.
Baseline Description	The baseline efficiency is determined based on the type of heating equipment installed. For boilers it is 75% AFUE and for furnaces it is 78% AFUE..
Savings Principle	The high efficiency case is characterized by the rated efficiency (AFUEEE) of the new high efficiency furnace or boiler.
Energy Savings calculation method	Calc
Savings unit	Heating system
Savings Equation	Delta MMBtu = (Btu/hr) x ((1/AFUEbase)-(1/AFUEee)) X EFLHheat x (1/1000000) Where: Btu/hr = Nominal heating capacity of the installed equipment (Btu/hr) AFUEBASE = Average fuel utilization efficiency of the existing equipment (%) AFUEEE = Average fuel utilization efficiency of the efficient equipment (%) EFLHHeat = Equivalent full load heating hours for the facility (Hr) 1/1,000,000 = Conversion from Btu to MMBtu
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	179.08
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	249.20
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR115
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating System
Sub-type	Retrofit Furnace
Program Name	Income Eligible MultiFamily
Measure Name	Heating System Retrofit, Furnace
Measure Description	Installation of high efficiency heating equipment to replace the existing inefficient furnace, hydronic boiler or steam boiler.
Baseline Description	The baseline efficiency is determined based on the type of heating equipment installed. For boilers it is 75% AFUE and for furnaces it is 78% AFUE..
Savings Principle	The high efficiency case is characterized by the rated efficiency (AFUEEE) of the new high efficiency furnace or boiler.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	Delta MMBtu = (Btu/hr) x ((1/AFUEbase)-(1/AFUEee)) X EFLHheat x (1/1000000) Where: Btu/hr = Nominal heating capacity of the installed equipment (Btu/hr) AFUEBASE = Average fuel utilization efficiency of the existing equipment (%) AFUEEE = Average fuel utilization efficiency of the efficient equipment (%) EFLHHeat = Equivalent full load heating hours for the facility (Hr) 1/1,000,000 = Conversion from Btu to MMBtu
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for an ENERGY STAR Qualified Gas Residential Furnace.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	138.18
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	249.20
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR116
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Heating System
Sub-type	Retrofit Boiler
Program Name	Income Eligible MultiFamily
Measure Name	Heating System Retrofit, Commercial Boiler
Measure Description	Installation of high efficiency heating equipment to replace the existing inefficient furnace, hydronic boiler or steam boiler.
Baseline Description	The baseline efficiency is determined based on the type of heating equipment installed. For boilers it is 75% AFUE and for furnaces it is 78% AFUE..
Savings Principle	The high efficiency case is characterized by the rated efficiency (AFUEEE) of the new high efficiency furnace or boiler.
Energy Savings calculation method	Calc
Savings unit	Heating system
Savings Equation	Delta MMBtu = (Btu/hr) x ((1/AFUEbase)-(1/AFUEee)) X EFLHheat x (1/1000000) Where: Btu/hr = Nominal heating capacity of the installed equipment (Btu/hr) AFUEBASE = Average fuel utilization efficiency of the existing equipment (%) AFUEEE = Average fuel utilization efficiency of the efficient equipment (%) EFLHHeat = Equivalent full load heating hours for the facility (Hr) 1/1,000,000 = Conversion from Btu to MMBtu
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	179.08
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	249.20
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR117
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise MultiFamily
Measure Name	Pipe Wrap (Heating)
Measure Description	Insulation upgrades to existing heating system pipes
Baseline Description	The baseline efficiency case is the existing equipment prior to the implementation of additional insulation.
Savings Principle	The high efficiency case includes pipe insulation.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.16
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR118
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Pipe Wrap (Heating)
Measure Description	Insulation upgrades to existing heating system pipes
Baseline Description	The baseline efficiency case is the existing equipment prior to the implementation of additional insulation.
Savings Principle	The high efficiency case includes pipe insulation.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.16
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.07
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	5.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR120
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	HVAC
Type	Ventilation
Sub-type	Heat Recovery Ventilator
Program Name	EnergyStar HVAC
Measure Name	Heat Recovery Ventilator
Measure Description	Heat Recovery Ventilators (HRV) can help make mechanical ventilation more cost effective by reclaiming energy from exhaust airflows. An electric penalty results due to the increased electricity consumed by the system fans.
Baseline Description	The baseline efficiency case is an ASHRAE 62.2-compliant exhaust fan system with no heat recovery.
Savings Principle	The high efficiency case is an exhaust fan system with heat recovery.
Energy Savings calculation method	Deemed
Savings unit	Installation of heat recovery ventilation system
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	-133
kWh/yr savings source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
kWh/yr savings note	#N/A
kW reduction	-0.07
kW reduction source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	7.7
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A

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RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Estimated using the demand allocation methodology described in: Cadmus Demand Impact Model (2012). Prepared for the Massachusetts Program Administrators.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	1.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	960.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 250 per measure

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TRM Reference Number	RIGR122
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Participant
Type	Participant
Sub-type	Participant
Program Name	Single Family Appliance Management
Measure Name	Participants
Measure Description	This row identifies a participant for tracking and cost purposes.
Baseline Description	0
Savings Principle	0
Energy Savings calculation method	0
Savings unit	0
Savings Equation	#N/A
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0.00
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A

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Water / Sewer savings note	#N/A
Annual $ savings	7.70
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR123
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Participant
Type	Participant
Sub-type	EW MF
Program Name	EnergyWise MultiFamily
Measure Name	Participant
Measure Description	This row identifies a participant for tracking and cost purposes.
Baseline Description	0
Savings Principle	0
Energy Savings calculation method	0
Savings unit	0
Savings Equation	#N/A
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17.2
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A

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Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR124
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	EnergyWise MultiFamily
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR125
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Income Eligible MultiFamily
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow.
Baseline Description	The baseline efficiency case is an existing faucet with a high flow.
Savings Principle	The high efficiency is a low-flow faucet aerator.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.12
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	26.61
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR126
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	1768.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR127
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2888.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR128
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Income Eligible MultiFamily
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	1768.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.65
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.72
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR129
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise
Measure Name	Low Flow Showerhead thermo Control (ladybug gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	296.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR132
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR133
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	EnergyWise MultiFamily
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	601.18
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 553/audit with multiple installed measures

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TRM Reference Number	RIGR134
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Income Eligible MultiFamily
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.31
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.72
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	390.45
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 390/audit with multiple installed measures

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TRM Reference Number	RIGR136
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Aerator
Program Name	EnergyWise
Measure Name	SF Aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a residential setting with service water heated by electricity.
Baseline Description	The baseline efficiency case is 2.2 GPM or greater faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed aerator
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.08
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR137
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Demand Circulator
Program Name	EnergyWise MultiFamily
Measure Name	Demand Circulator
Measure Description	Installation of a demand controller on a re-circulation loop.
Baseline Description	Full time operation of re-circ pump.
Savings Principle	The re-circulation pump is controlled by a demand signal or timer to reduce operating hours when no hot water usage occurs.
Energy Savings calculation method	Calc
Savings unit	Installed recirc controller
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR138
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Demand Circulator
Program Name	Income Eligible MultiFamily
Measure Name	Demand Circulator
Measure Description	Installation of a demand controller on a re-circulation loop.
Baseline Description	Full time operation of re-circ pump.
Savings Principle	The re-circulation pump is controlled by a demand signal or timer to reduce operating hours when no hot water usage occurs.
Energy Savings calculation method	Calc
Savings unit	Installed recirc controller
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	54.41
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR139
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	LF Showerhead
Program Name	EnergyWise
Measure Name	Energy Wise Single FamilyShowerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less.
Baseline Description	The baseline efficiency case is a showerhead with a flow of 2.5 gpm. For home audit applications, the baseline is the existing showerhead.
Savings Principle	The high efficiency is a low-flow showerhead with a flow of 1.5 gpm or less.
Energy Savings calculation method	Deemed
Savings unit	Installed showerhead.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	0.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR140
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise
Measure Name	SF Pipe Wrap
Measure Description	Installation of insulation to reduce water heating energy.
Baseline Description	The baseline case is uninsulated heated water pipes.
Savings Principle	The high efficiency case is the installation of high-efficiency domestic hot water equipment such as low-flow showerheads and faucet aerators.
Energy Savings calculation method	Deemed
Savings unit	Installed pipe wrap job
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.06
Gas Heat MMBtu/yr savings source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	DNV GL RI EnergyWise Single Family Evaluation, July 2016
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	2537.08
Gross Measure TRC source	Cadmus, Inc., LED Incremental Cost Study - Modeling Light Tracker LED and Halogen Pricing Data, June 2015
Gross Measure TRC note	#N/A
Incentive Unit	$ 1776/audit with multiple installed measures

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TRM Reference Number	RIGR141
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	EnergyWise MultiFamily
Measure Name	Pipe Wrap (Water Heating)
Measure Description	Installation of DHW pipe wraps
Baseline Description	The baseline efficiency case is the existing hot water equipment.
Savings Principle	The high efficiency case includes pipe wrap.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	1.14
Gas Heat MMBtu/yr savings source	Illume and Navigant Consulting (2014). Rhode Island Behaviorial Program and Pilot Impacts and Process Evaluation.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR142
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Income Eligible MultiFamily
Measure Name	Pipe Wrap (Water Heating)
Measure Description	Installation of DHW pipe wraps
Baseline Description	The baseline efficiency case is the existing hot water equipment.
Savings Principle	The high efficiency case includes pipe wrap.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	1.14
Gas Heat MMBtu/yr savings source	Illume and Navigant Consulting (2014). Rhode Island Behaviorial Program and Pilot Impacts and Process Evaluation.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.53
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	5.00
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR144
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Efficient Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Tankless Water Heater
Measure Description	Installation of high efficiency water heating equipment to replace the existing inefficient water heater.
Baseline Description	The baseline efficiency case is a stand-alone tank water heater with an energy factor of 0.575.
Savings Principle	The high efficiency case includes the new efficient water heater with an Energy Factor > 0.60.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	Delta MMBtu = Units x (18 MMBTu/Units) x ((1/EFbase) - (1/EFee) Unit = Total number of dwelling units utilizing the water heater 18 MMBtu/Unit = Average annual water heating energy demand per dwelling unit401 EFBASE = Energy Factor for the baseline water heater EFEE = Energy Factor for the new efficient water heater
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.58
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.82
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR145
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Efficient Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Indirect Water Heater
Measure Description	Installation of high efficiency water heating equipment to replace the existing inefficient water heater.
Baseline Description	The baseline efficiency case is a stand-alone tank water heater with an energy factor of 0.575.
Savings Principle	The high efficiency case includes the new efficient water heater with an Energy Factor > 0.60.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	Delta MMBtu = Units x (18 MMBTu/Units) x ((1/EFbase) - (1/EFee) Unit = Total number of dwelling units utilizing the water heater 18 MMBtu/Unit = Average annual water heating energy demand per dwelling unit401 EFBASE = Energy Factor for the baseline water heater EFEE = Energy Factor for the new efficient water heater
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	55.14
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.82
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR146
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Water Heating
Type	Water Heater
Sub-type	Efficient Water Heater
Program Name	Income Eligible MultiFamily
Measure Name	Stand Alone Water Heater
Measure Description	Installation of high efficiency water heating equipment to replace the existing inefficient water heater.
Baseline Description	The baseline efficiency case is a stand-alone tank water heater with an energy factor of 0.575.
Savings Principle	The high efficiency case includes the new efficient water heater with an Energy Factor > 0.60.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	Delta MMBtu = Units x (18 MMBTu/Units) x ((1/EFbase) - (1/EFee) Unit = Total number of dwelling units utilizing the water heater 18 MMBtu/Unit = Average annual water heating energy demand per dwelling unit401 EFBASE = Energy Factor for the baseline water heater EFEE = Energy Factor for the new efficient water heater
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	DOE (2008). ENERGY STAR® Residential Water Heaters: Final Criteria Analysis. Prepared for the DOE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	143.02
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	1.82
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGR147
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	New Movers
Measure Description	A Home Energy report sent to gas customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	A control group of homes that does not receive Home Energy Reports.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Customer receiving energy reports
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	0.93
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate will be determined by an independent evaluation.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	3.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 3.71 per participant

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TRM Reference Number	RIGR151
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	Opt-out dual fuel
Measure Description	A Home Energy report sent to gas customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	No Home Energy Report.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Per participant
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate will be determined by an independent evaluation.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	3.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 3.71 per participant

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TRM Reference Number	RIGR152
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	Opt-out gas
Measure Description	A Home Energy report sent to gas customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	No Home Energy Report.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Per participant
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	0.89
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate will be determined by an independent evaluation.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	3.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 3.71 per participant

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TRM Reference Number	RIGR153
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Behavior
Sub-type	Home Energy Reports
Program Name	Home Energy Reports
Measure Name	New movers dual fuel
Measure Description	A Home Energy report sent to gas customers that displays home energy consumption in comparison with peers and prompts energy conserving behavior.
Baseline Description	No Home Energy Report.
Savings Principle	A home that receives Home Energy Reports.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Per participant
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	Opinion Dynamics with Navigant Consulting (2012). Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report July 2012. Prepared for Massachusetts Energy Efficiency Advisory Council & Behavioral Research Team
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is 100% since measure life is 1 year.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate will be determined by an independent evaluation.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	Free-ridership and spillover are not applicable as customers cannot participate without the utility program.
Gross Measure TRC unit	3.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 3.71 per participant

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TRM Reference Number	RIGR154
Fuel	Gas
Sector	Residential
Project Type	Retrofit
Category	Whole Home
Type	Weatherization
Sub-type	EW SF
Program Name	EnergyWise
Measure Name	Energy Wise Single FamilyWeatherization
Measure Description	Installation of weatherization measures such as air sealing and insulation in gas heated homes. Electric savings are achieved from reduced run time of the HVAC system fan(s).
Baseline Description	The baseline efficiency case is the existing home shell.
Savings Principle	The high efficiency case can be a combination of increased insulation, air sealing, duct sealing, and other improvements to the home shell.
Energy Savings calculation method	Deemed
Savings unit	Household with weatherization measures installed
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	11.09
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	0.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	0.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	66.59
Annual $ savings source / description	#N/A
Annual $ savings note	NEI per participant / treated unit
One time $ savings	513.88
One time $ savings source/description	#N/A
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC038
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Direct Install
Measure Name	Programmable thermostat
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	3.2
Gas Heat MMBtu/yr savings source	E-mail correspondence among MA PAs and Ralph Prahl
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.02
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	180.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 126 per measure

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TRM Reference Number	RIGC040
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	HVAC
Type	Controls
Sub-type	Boiler Control
Program Name	Direct Install
Measure Name	Boiler Reset Control
Measure Description	Boiler reset controls are devices that automatically control boiler water temperature based on outdoor temperature using a software program.
Baseline Description	Fixed boiler water temperature.
Savings Principle	The high efficiency case is a boiler with reset controls.
Energy Savings calculation method	Deemed
Savings unit	Installed boiler reset control
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	35.5
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	ACEEE (2006). Emerging Technologies Report: Advanced Boiler Controls. Prepared for ACEEE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	600.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 420 per measure

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TRM Reference Number	RIGC041
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	HVAC
Type	Insulation
Sub-type	Duct
Program Name	Direct Install
Measure Name	INS_DUCT_SF
Measure Description	The installation of duct insulation and air sealing.
Baseline Description	Un-insulated ductwork with air leaks
Savings Principle	Insulating and air sealing ductwork reduces heat loss / gain, thereby saving energy.
Energy Savings calculation method	Deemed
Savings unit	SF of installed insulation
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	1.3
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.02
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$1.50/SF

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TRM Reference Number	RIGC042
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	HVAC
Type	Steam Traps
Sub-type	Steam Trap
Program Name	Direct Install
Measure Name	Steam trap HVAC
Measure Description	The repair or replacement of malfunctioning steam traps.
Baseline Description	The baseline efficiency case is a failed steam trap.
Savings Principle	The high efficiency case is a repaired or replaced steam trap.
Energy Savings calculation method	Deemed
Savings unit	Repaired or replaced steam trap.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	25.7
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	DNV GL MA 2013 Prescriptive Gas Impact Evaluation: Steam Trap Evaulation Phase 1
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.03
Spill-Over (participant)	0.02
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$50 per trap

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TRM Reference Number	RIGC046
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Controls
Sub-type	Recirc
Program Name	Direct Install
Measure Name	DEMAND CIRCULATOR
Measure Description	Installation of a demand controller on a re-circulation loop.
Baseline Description	Full time operation of re-circ pump.
Savings Principle	The re-circulation pump is controlled by a demand signal or timer to reduce operating hours when no hot water usage occurs.
Energy Savings calculation method	Deemed
Savings unit	Installed recirc controller
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	96
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.16
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIGC047
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Direct Install
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is a 2.2 GPM faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	130
Hours Source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	5460.00
Sewer savings: gallons/yr	5460.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	11.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 11 per measure

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TRM Reference Number	RIGC048
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Direct Install
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is a 2.5 GPM showerhead.
Savings Principle	The high efficiency case is a 1.5 GPM showerhead.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	121.6
Hours Source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	10
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	7300.00
Sewer savings: gallons/yr	7300.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	35.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 24.5 per measure

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TRM Reference Number	RIGC049
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Spray Valve
Program Name	Direct Install
Measure Name	Pre-rinse spray valve
Measure Description	Retrofitting existing standard spray nozzles in locations where service water is supplied by natural gas fired hot water heater with new low flow pre-rinse spray nozzles with an average flow rate of 1.6 GPM.
Baseline Description	The baseline efficiency case is a standard efficiency spray valve.
Savings Principle	The high efficiency case is a low flow pre-rinse spray valve with an average flow rate of 1.6 GPM.
Energy Savings calculation method	Deemed
Savings unit	Installed pre-rinse spray valve.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Veritec Consulting (2005). Region of Waterloo Pre-Rinse Spray Valve Pilot Study.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	6410.00
Sewer savings: gallons/yr	6410.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	100.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIGC050
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Spray Valve
Program Name	Direct Install
Measure Name	Salon Nozzle
Measure Description	The installation of a high efficiency salon nozzle.
Baseline Description	Standard salon nozzle.
Savings Principle	An efficient salon nozzle.
Energy Savings calculation method	Deemed
Savings unit	Installed salon nozzle
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	28639.00
Sewer savings: gallons/yr	28639.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	100.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIGC051
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Water Heater Insulation
Sub-type	Insulation
Program Name	Direct Install
Measure Name	Insulation Pipe Diameter 1.5in H2O
Measure Description	Install insulation on hot water piping located in non-conditioned spaces.
Baseline Description	Existing uninsulated pipe.
Savings Principle	The high efficiency condition is hot water piping in unconditional space with insulation installed.
Energy Savings calculation method	Deemed
Savings unit	Installed LF of pipe insulation
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.21
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 5.6 per measure

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TRM Reference Number	RIGC052
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Water Heater Insulation
Sub-type	Insulation
Program Name	Direct Install
Measure Name	Insulation Pipe Diameter 1.5in Steam
Measure Description	Install insulation on steam piping located in non-conditioned spaces.
Baseline Description	Existing uninsulated pipe.
Savings Principle	The high efficiency condition is steam piping in unconditional space with insulation installed.
Energy Savings calculation method	Deemed
Savings unit	Installed LF of pipe insulation
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.21
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 5.6 per measure

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TRM Reference Number	RIGC053
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Water Heater Insulation
Sub-type	Insulation
Program Name	Direct Install
Measure Name	Insulation Pipe Diameter 2in H2O
Measure Description	Install insulation on hot water piping located in non-conditioned spaces.
Baseline Description	Existing uninsulated pipe.
Savings Principle	The high efficiency condition is hot water piping in unconditional space with insulation installed.
Energy Savings calculation method	Deemed
Savings unit	Installed LF of pipe insulation
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.36
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	11.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 7.7 per measure

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TRM Reference Number	RIGC054
Fuel	Gas
Sector	C&I
Project Type	Direct Install
Category	Water Heating
Type	Water Heater Insulation
Sub-type	Insulation
Program Name	Direct Install
Measure Name	Insulation Pipe Diameter 2in Steam
Measure Description	Install insulation on steam piping located in non-conditioned spaces.
Baseline Description	Existing uninsulated pipe.
Savings Principle	The high efficiency condition is steam piping in unconditional space with insulation installed.
Energy Savings calculation method	Deemed
Savings unit	Installed LF of pipe insulation
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.37
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Energy & Resource Solutions (2005). Measure Life Study. Prepared for The Massachusetts Joint Utilities.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.05
Spill-Over (participant)	0.01
Spill-Over (non-participant)	0.00
Net-to-Gross	0.97
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	11.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 7.7 per measure

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TRM Reference Number	RIGC055
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Codes and Standards
Type	Codes and Standards
Sub-type	Codes and Standards
Program Name	Commercial New Construction
Measure Name	CODES AND STANDARDS
Measure Description	Energy efficiency code trainings and advocacy work to improve energy efficiency of buildings and equipment within Rhode Island.
Baseline Description	Un-influenced adoption curve of federal minimum codes and standards.
Savings Principle	Accelerated adoption of advancing energy codes and equipment standards.
Energy Savings calculation method	Calculated based on attribution study
Savings unit	0
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	KEMA Rhode Island Energy Code Compliance Baseline Study
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	KEMA Rhode Island Energy Code Compliance Baseline Study
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00

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CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC056
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Boiler, Condensing Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC057
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Boiler, Condensing Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC058
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Boiler, Condensing Year round
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC059
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Boiler, Non-Condensing Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC060
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Boiler, Non-Condensing Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC061
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Boiler, Non-Condensing Year round
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC062
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Boiler
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Steam boiler
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC063
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	CHP
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Combined Heat and Power (Gas)
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC064
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Cooling
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Gas driven cooling
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC065
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	DHW
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Domestic Hot Water
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC066
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Food Service
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Food Service
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC067
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Food Service
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Kitchen Equipment
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC068
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Furnace
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Furnace, Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC069
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Furnace
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Furnace, Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC070
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Furnace
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Furnace, Year-round
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC071
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Heat Pump
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Heat Pump
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC072
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Heat Recovery
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Heat Recovery, Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC073
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Heat Recovery
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Heat Recovery, Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC074
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Heat Recovery
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Heat Recovery, Year Round
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC075
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	HVAC
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Energy Management System (building)
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC076
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	HVAC
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	HVAC
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC077
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	HVAC
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	HVAC insulation
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC078
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Other
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Other Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.03
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC079
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Other
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Other Year Round
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.03
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC080
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Other
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Other Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.03
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC081
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Process
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Process
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC082
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Solar heat
Sub-type	Blend
Program Name	Commercial New Construction
Measure Name	Solar Heat Blend
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC083
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Solar heat
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Solar Heating
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC084
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Solar heat
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	Solar Heat Year Round (DHW)
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC085
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Steam Traps
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Steam Trap
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	DNV GL MA 2013 Prescriptive Gas Impact Evaluation: Steam Trap Evaulation Phase 1
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC086
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Ventilation
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Ventilation Reduction
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC087
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	VSD
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	VSDs on HVAC
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC088
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	VSD
Sub-type	Year round
Program Name	Commercial New Construction
Measure Name	VSDs on non-HVAC
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC101
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Whole Building
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Advanced Building
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC102
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Whole Building
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Building Shell
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC104
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Custom
Type	Whole Building
Sub-type	Heating
Program Name	Commercial New Construction
Measure Name	Comprehensive Design
Measure Description	The Custom project track is offered for energy efficiency projects involving complex site-specific applications that require detailed engineering analysis and/or projects which do not qualify for incentives under any of the prescriptive rebate offering. Projects offered through the custom approach must pass a cost-effectiveness test based on project-specific costs and savings.
Baseline Description	For Lost Opportunity projects, the baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code or industry accepted standard practice. For retrofit projects, the baseline efficiency case is based on site-specific information.
Savings Principle	The high efficiency case is specific to the custom project and may include one or more energy efficiency measures. Energy and demand savings calculations are based on projected or measured changes in equipment efficiencies and operating characteristics and are determined on a case-by-case basis. The project must be proven cost-effective in order to qualify for energy efficiency incentives.
Energy Savings calculation method	Custom
Savings unit	Installed custom efficiency application.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	DNV GL (2016) Impact Evaluation of 2014 Custom Gas Installations in Rhode Island

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RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	Calc
Sewer savings: gallons/yr	Calc
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.01
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.09
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.91
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	8863.71
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 6647.78 per measure

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TRM Reference Number	RIGC105
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Fryer
Program Name	Commercial New Construction
Measure Name	Commercial gas fryer
Measure Description	The installation of a natural-gas fired fryer that is either ENERGY Star rated or has a heavy-load cooking efficiency of at least 50%. Qualified fryers use advanced burner and heat exchanger designs to use fuel more efficiently, as well as increased insulation to reduce standby heat loss.
Baseline Description	The baseline efficiency case is a typical low-efficiency gas-fired fryer with 35% cooking efficiency, 16,000 Btu preheat energy, 14,000 Btu/h Idle Energy rate, and 60 lbs/h production capacity.
Savings Principle	The high efficiency case cooking efficiency and Idle Energy Rate are site specific and can be determined on a case-by-case basis. To simplify the savings algorithm, typical values for food load (150 lbs/day) and preheat energy (15.500 Btu) are assumed.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired fryer.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Environmental Protection Agency (2009). Life Cycle Cost Estimate for ENERGY STAR Qualified Gas Fryer.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3400.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC106
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Griddle
Program Name	Commercial New Construction
Measure Name	Commercial gas griddle
Measure Description	Installation of a high efficiency gas-fired griddle.
Baseline Description	The baseline efficiency case is a standard efficiency (30% efficient) gas griddle.
Savings Principle	The high efficiency case is a gas griddle with an efficiency of 38%.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired griddle
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2011). Gas Griddle Life-Cycle Cost Calculation. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1165.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIGC107
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Gas-fired combination oven (>= 44% efficiency)
Measure Description	Installation of high efficiency gas-fired ovens.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired oven.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2011). Gas Combination Oven Life-Cycle Cost Calculator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1300.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC108
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Gas-fired convection oven (>= 44% efficiency)
Measure Description	Installation of high efficiency gas-fired ovens.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired oven.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2012). Gas Convection Oven Life-Cycle Cost Calculator. http://www.fishnick.com/saveenergy/tools/calculators/govencalc.php.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1886.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC109
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Gas-fired conveyer oven (>= 44% efficiency)
Measure Description	Installation of high efficiency gas-fired ovens.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired oven.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2011). Gas Conveyor Oven Life-Cycle Cost Calculator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2100.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC110
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Oven
Program Name	Commercial New Construction
Measure Name	Gas-fired rack oven (>= 50% efficiency)
Measure Description	Installation of high efficiency gas-fired ovens.
Baseline Description	The baseline efficiency case is a standard oven that meets the baseline cooking energy efficiency requirements shown in Table 15.
Savings Principle	The high efficiency case is an oven that meets or exceeds the high efficiency ratings shown in Table 15.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired oven.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Food Service Technology Center (2011). Gas Conveyor Oven Life-Cycle Cost Calculator.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4000 per measure

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TRM Reference Number	RIGC111
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Food Service
Type	Cooking Equipment
Sub-type	Steamer
Program Name	Commercial New Construction
Measure Name	Commercial gas steamer (>= 38% efficiency)
Measure Description	The baseline efficiency case is a typical boiler-based steamer with the following operating parameters: Preheat Energy rate = 72,000 Btu/hour, Idle Energy Rate = 18,000 Btu/hour, Heavy Load Efficiency = 18.0%, Production Capacity per pan = 23.3 lbs/hour, Average Water Consumption Rate = 40 gal/hour, and Percentage of Time in Constant Steam Mode = 40%.
Baseline Description	The baseline efficiency case is a typical boiler-based steamer with the following operating parameters: cooking energy efficiency = 18%, production capacity per pan = 23.3 lbs/hr, preheat energy rate = 72,000 Btu/hr, idle energy rate = 18,000 Btu/h, water consumption of 40gal/h, and Percentage of Time in Constant Steam Mode = 40%.
Savings Principle	The high efficiency case is an ENERGY STAR® qualified gas-fired steamer with the following operating parameters for a 6 pan steamer: Preheat Energy Rate = 36,000 Btu/hour, Idle Energy Rate = 12,500 Btu/hour, Heavy Load Efficiency = 38.0%, Production Capacity per pan = 20 lbs/hour, and Average Water Consumption Rate = 3 gallons/hour, and Percentage of Time in Constant Steam Mode = 40%.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency gas-fired steamer.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	4380
Hours Source	Environmental Protection Agency (2011). Savings Calculator for ENERGY Star Qualified Commercial Kitchen Equipment: Steam Cooker Calcs. Accessed on 10/12/2011.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	12
measure life source	Environmental Protection Agency (2011). Savings Calculator for ENERGY STAR Qualified Commercial Kitchen Equipment: Steam Cooker Calcs.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	100% realization rates are assumed because savings are based on researched assumptions by FSTC.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	162060.00
Sewer savings: gallons/yr	162060.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.26
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2000.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC112
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Boiler
Sub-type	Combo Condensing
Program Name	Commercial New Construction
Measure Name	COMBO COND BOIL/WTR HTR 95+
Measure Description	This measure promotes the installation of a combined high-efficiency boiler and water heating unit. Combined boiler and water heating systems are more efficient than separate systems because they eliminate the standby heat losses of an additional tank.
Baseline Description	The baseline efficiency case is an 80% AFUE boiler with a 0.594 EF water heater.
Savings Principle	The high efficiency case is a condensing, integrated water heater/boiler with an AFUE >= 90%.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing combination DHW heater / boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	31.8
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC113
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Controls
Sub-type	Boiler Control
Program Name	Commercial New Construction
Measure Name	BOILER RESET 1 STAGE
Measure Description	Boiler reset controls are devices that improve the efficiency of an existing boiler system by modulating the hot water temperature set point. Reset controls automatically control boiler water temperature based on outdoor temperature using a software program; load controls sense the thermal demand of the heating system and resets the water temperature based on the demand.
Baseline Description	The baseline efficiency case is a boiler without reset or load controls.
Savings Principle	The efficient case is a boiler with reset or load controls, which reset the supply water temperature based on outdoor temperatures and/or building load.
Energy Savings calculation method	Deemed
Savings unit	Installation of boiler reset control on existing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	35.5
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC115
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial Retrofit
Measure Name	Boiler95
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that meets or exceeds 95% efficiency.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	27.8
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC116
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Boiler96
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that meets or exceeds 96% efficiency.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	29.3
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC117
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Furnace
Program Name	Commercial New Construction
Measure Name	Furnace96ECM
Measure Description	The installation of a high efficiency natural gas warm air furnace with an electronically commutated motor (ECM) for the fan. High efficiency furnaces are better at converting fuel into direct heat and better insulated to reduce heat loss. ECM fan motors significantly reduce fan motor electric consumption as compared to both shaped-pole and permanent split capacitor motors.
Baseline Description	The baseline efficiency case is a 85% AFUE furnace in the <150 kBTuh size category.
Savings Principle	The high efficiency case is a new furnace with AFUE >= 96% and an electronically commutated motor.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency warm air furnace with ECM fan motor
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	168
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0.124
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	9.5
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00

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RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.06
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC119
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler <= 300 MBH 90%
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	30.6
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3479.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1000 per measure

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TRM Reference Number	RIGC120
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler <= 300 MBH 95%
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	27.8
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3848.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1500 per measure

.

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TRM Reference Number	RIGC121
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler 1000
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	197.2
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	7874.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 7500 per measure

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TRM Reference Number	RIGC122
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler 1701+ MBH
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	345.1
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	10601.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 10000 per measure

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TRM Reference Number	RIGC123
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler 301
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	58.4
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.

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RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3879.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 2000 per measure

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TRM Reference Number	RIGC124
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Condensing boiler 500
Measure Description	The installation of a high efficiency natural gas fired condensing boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency. (Only condensing boilers are offered as prescriptive measures. Program incentives for other boiler types are offered through the custom program.)
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that exceeds the efficiency levels required by Rhode Island State Building Code. Actual site efficiencies should be determined on a case-by-case basis.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	107.3
Gas Heat MMBtu/yr savings source	The Cadmus Group (2013). 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A

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RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	5077.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 4000 per measure

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TRM Reference Number	RIGC125
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Boiler
Program Name	Commercial New Construction
Measure Name	Integrated water heater/condensing boiler (EF 0.90; AFUE 90%)
Measure Description	This measure promotes the installation of a combined high-efficiency boiler and water heating unit. Combined boiler and water heating systems are more efficient than separate systems because they eliminate the standby heat losses of an additional tank.
Baseline Description	The baseline efficiency case is an 80% AFUE boiler with a 0.594 EF water heater.
Savings Principle	The high efficiency case is a condensing, integrated water heater/boiler with an AFUE >= 90%.
Energy Savings calculation method	Deemed
Savings unit	Installed high efficiency integrated boiler/water heater unit.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	ASHRAE Applications Handbook (2003); Page 36.3, assumes combined boiler and water heating systems have a measure life similar to a typical boiler.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	-0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1273.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1500 per measure

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TRM Reference Number	RIGC126
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Furnace
Program Name	Commercial New Construction
Measure Name	Furnace 95+ AFUE (<150) w/ECM Motor
Measure Description	The installation of a high efficiency natural gas warm air furnace with an electronically commutated motor (ECM) for the fan. High efficiency furnaces are better at converting fuel into direct heat and better insulated to reduce heat loss. ECM fan motors significantly reduce fan motor electric consumption as compared to both shaped-pole and permanent split capacitor motors.
Baseline Description	The baseline efficiency case is a 85% AFUE furnace in the <150 kBTuh size category.
Savings Principle	The high efficiency case is a new furnace with AFUE >= 95% and an electronically commutated motor.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency warm air furnace with ECM fan motor
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	168
kWh/yr savings source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.124
kW reduction source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	9
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.06
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1626.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

.

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TRM Reference Number	RIGC127
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Furnace
Program Name	Commercial New Construction
Measure Name	Furnace 97+ AFUE (<150) w/ECM Motor
Measure Description	The installation of a high efficiency natural gas warm air furnace with an electronically commutated motor (ECM) for the fan. High efficiency furnaces are better at converting fuel into direct heat and better insulated to reduce heat loss. ECM fan motors significantly reduce fan motor electric consumption as compared to both shaped-pole and permanent split capacitor motors.
Baseline Description	The baseline efficiency case is a 85% AFUE furnace in the <150 kBTuh size category.
Savings Principle	The high efficiency case is a new furnace with AFUE >= 97% and an electronically commutated motor.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency warm air furnace with ECM fan motor
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	168
kWh/yr savings source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kWh/yr savings note	#N/A
kW reduction	0.124
kW reduction source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	9.9
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.

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Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	Energy & Resource Solutions (2011). BFM Impact Evaluation Report. Prepared for the Electric and Gas Program Administrators of Massachusetts.
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.16
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.06
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1707.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 800 per measure

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TRM Reference Number	RIGC128
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Infrared Heater
Program Name	Commercial New Construction
Measure Name	Infrared heater
Measure Description	The installation of a gas-fired low intensity infrared heating system in place of a unit heater, furnace, or other standard efficiency equipment. Infrared heating uses radiant heat as opposed to warm air to heat buildings. In commercial environments with high air exchange rates, heat loss is minimal because the space's heat comes from surfaces rather than air.
Baseline Description	The baseline efficiency case is a standard efficiency gas-fired unit heater with combustion efficiency of 80%.
Savings Principle	The high efficiency case is a gas-fired low-intensity infrared heating unit.
Energy Savings calculation method	Deemed
Savings unit	Installed infrared heater
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	12
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	17
measure life source	Nexant (2006). DSM Market Characterization Report. Prepared for Questar Gas.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.06
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2982.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 750 per measure

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TRM Reference Number	RIGC129
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	HVAC
Type	Heating
Sub-type	Unit Heater
Program Name	Commercial New Construction
Measure Name	Condensing Unit heater
Measure Description	The baseline efficiency case is a standard efficiency gas fired unit heater with minimum combustion efficiency of 80%, interrupted or intermittent ignition device (IID), and either power venting or an automatic flue damper.
Baseline Description	The baseline efficiency case is a standard efficiency unit heater.
Savings Principle	The high efficiency case is a condensing gas unit heater with 90% AFUE or greater.
Energy Savings calculation method	Deemed
Savings unit	Installed condensing unit heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	40.9
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	18
measure life source	Ecotrope, Inc. (2003). Natural Gas Efficiency and Conservation Measure Resource Assessment for the Residential and Commercial Sectors. Prepared for the Energy Trust of Oregon.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.06
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2400.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 750 per measure

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TRM Reference Number	RIGC130
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	DHW
Sub-type	Tank 0.67 EF
Program Name	Commercial New Construction
Measure Name	WATER HEATER TANK 0.67 EF
Measure Description	The installation of a high-efficiency tank water heater over 0.67 EF.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a tank water heater that is ENERGY STAR® rated with an Energy Factor of at least .67 and a nominal input of 75,000 Btu/hour or less.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency DHW tank
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	13
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC131
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	DHW
Sub-type	Hot water boiler
Program Name	Commercial New Construction
Measure Name	Water Heating Boiler - 85% TE
Measure Description	The installation of a high efficiency natural gas fired DHW boilers. High efficiency boilers take advantage of improved design to achieve improved efficiency.
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that meets or exceeds 85% efficiency.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency DHW boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC132
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	DHW
Sub-type	Hot water boiler
Program Name	Commercial New Construction
Measure Name	Water Heating Boiler - 92% TE
Measure Description	The installation of a high efficiency natural gas fired condensing DHW boilers. High efficiency boilers take advantage of improved design, sealed combustion and condensing flue gases in a second heat exchanger to achieve improved efficiency.
Baseline Description	The baseline efficiency assumes compliance with the International Energy Conservation Code (IECC) 2012. Table 19 in Appendix A details the specific efficiency requirements by equipment type and capacity.
Savings Principle	The high efficiency case assumes a gas-fired boiler that meets or exceeds 92% efficiency.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency condensing DHW boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC133
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	DHW
Sub-type	Condensing Water Heater
Program Name	Commercial New Construction
Measure Name	COND WATER HEATER 90%MIN 75-800
Measure Description	The installation of a high-efficiency condensing water heater over 95% and between 75-300 kBtuh.
Baseline Description	The baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code. For condensing stand-alone water heaters, the baseline is a stand-alone tank water heater with a thermal efficiency of 80%.
Savings Principle	The high efficiency case is a condensing stand-alone commercial water heater with a thermal efficiency of 95% or greater and a capacity between 75,000 Btu and 300,000 Btu.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency DHW tank
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.62
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC134
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	Commercial New Construction
Measure Name	WATER HEATER - ON-DEMAND 94
Measure Description	Tankless water heaters circulate water through a heat exchanger to be heated for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a tankless water heater that is ENERGY STAR® rated with an Energy Factor of at least 0.94.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC135
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Condensing Water Heater
Program Name	Commercial New Construction
Measure Name	Condensing stand Alone Water Heater
Measure Description	The installation of a high-efficiency condensing water heater over 95% and between 75-300 kBtuh.
Baseline Description	The baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code. For condensing stand-alone water heaters, the baseline is a stand-alone tank water heater with a thermal efficiency of 80%.
Savings Principle	The high efficiency case is a condensing stand-alone commercial water heater with a thermal efficiency of 95% or greater and a capacity between 75,000 Btu and 300,000 Btu.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2340.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIGC136
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Indirect Water Heater
Program Name	Commercial New Construction
Measure Name	Indirect water heater (EF >= 0.82, CAE >= 85%)
Measure Description	The installation of a an indirect water heater that uses a storage tank that is heated by the main boiler. The energy stored by the water tank allows the boiler to turn off and on less often.
Baseline Description	The baseline efficiency case assumes compliance with the efficiency requirements as mandated by Rhode Island State Building Code. For condensing stand-alone water heaters, the baseline is a stand-alone tank water heater with a thermal efficiency of 80%.
Savings Principle	The high efficiency case is an indirect water heater with a Combined Appliance Efficiency (CAE) of 85% or greater.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A

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RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1749.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 400 per measure

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TRM Reference Number	RIGC137
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	Commercial New Construction
Measure Name	On-demand tankless water heater (EF>=0.82)
Measure Description	Tankless water heaters circulate water through a heat exchanger to be heated for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a tankless water heater that is ENERGY STAR® rated with an Energy Factor of at least 0.82.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	2817.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 500 per measure

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TRM Reference Number	RIGC138
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	Commercial New Construction
Measure Name	On-demand tankless water heater (EF>=0.90)
Measure Description	Condensing tankless water heaters heat water more efficiently by using either a larger heat exchanger or a second heat exchanger to reduce the flue-gas temperature below dewpoint, and heating water for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a tankless water heater that is ENERGY STAR® rated with an Energy Factor of at least 0.90.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3449.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 800 per measure

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TRM Reference Number	RIGC139
Fuel	Gas
Sector	C&I
Project Type	New Construction
Category	Water Heating
Type	Water Heater
Sub-type	Tankless Water Heater
Program Name	Commercial New Construction
Measure Name	On-demand tankless water heater (EF>=0.95)
Measure Description	Condensing tankless water heaters heat water more efficiently by using either a larger heat exchanger or a second heat exchanger to reduce the flue-gas temperature below dewpoint, and heating water for immediate use, eliminating the standby heat loss associated with a storage tank.
Baseline Description	The baseline efficiency case is a standalone tank water heater with an energy factor of 0.61.
Savings Principle	The high efficiency case is a tankless water heater that is ENERGY STAR® rated with an Energy Factor of at least 0.95.
Energy Savings calculation method	Deemed
Savings unit	Installed high-efficiency water heater.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.09
Annual $ savings source / description	DNV GL (2015) Massachusetts Electric & Gas Program Administrators: C&I New Construction Non-Energy Impacts Study
Annual $ savings note	NEI per Therm
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.42
Spill-Over (participant)	0.05
Spill-Over (non-participant)	0.00
Net-to-Gross	0.63
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	3449.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 800 per measure

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TRM Reference Number	RIGC141
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Building Shell
Type	Air Sealing
Sub-type	Air Sealing/Infiltration
Program Name	Commercial and Industrial MultiFamily
Measure Name	Air Sealing
Measure Description	Thermal shell air leaks are sealed through strategic use and location of air-tight materials.
Baseline Description	The baseline efficiency case is the existing building before the air sealing measure is implemented. The baseline building is characterized by the existing CFM50 measurement (CFM50PRE) for single family homes, or the existing air changes per hour (ACHPRE)
Savings Principle	The high efficiency case is the existing building after the air sealing measure is implemented. The high efficiency building is characterized by the new CFM50 measurement for single family homes (CFM50POST), or the new air changes per hour (ACHPOST) for multi-family facilities, which is measured after the air sealing measure is implemented.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed air sealing project.
Savings Equation	Gross MMBtu Gas = (CFM50_pre - CFM50_post) / LBL × HDD × (Hours per Day) × (Minutes per Hour) × (Btu/ft3-°F) × CorrectionFactor / SeasonalEff / (Btu per MMBtu) Where: CFM50_pre = CFM50 measurement before air sealing CFM50_post = CFM50 measurement after air sealing (cu.ft./min) LBL = LBL factor - This factor is determined as the product of the N-factor and a Height Correction Factor according to BPI Protocol 4644 HDD = Heating degree days (deg. F-day); This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data. http://www.ncdc.noaa.gov 24 Hours per Day = Conversion factor 60 Minutes per Hour = Conversion factor 0.018 Btu/ft3-°F = Heat capacity of 1 cubic foot of air at 70 °F 1 CorrectionFactor = Correction factor determined by auditor (e.g. for seasonal homes): Default 0.7 SeasonalEff = Heating system seasonal efficiency factor determined by auditor for homes heated with natural gas: Default 1,000,000 Btu per MMBtu = Conversion factor
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0

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measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	19.28
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	135.83
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.19
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIGC147
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Building Shell
Type	Insulation
Sub-type	Shell
Program Name	Commercial and Industrial MultiFamily
Measure Name	MF Shell Insulation
Measure Description	Insulation upgrades are applied in existing multifamily facilities.
Baseline Description	The baseline efficiency case is characterized by the total R-value of the existing attic, basement or sidewall (Rexisit). This is calculated as the R-value of the existing insulation, estimated by the program contractor, plus the R-value of the ceiling, floor, or wall (for all projects: RCEILING = 3.36; RFLOOR = 6.16; RWALL = 6.65)
Savings Principle	The high efficiency case is characterized by the total R-value of the attic after the installation of additional attic, basement or sidewall insulation. This is calculated as the sum of the existing R-value (RBASE) plus the R-value of the added insulation (RADD).
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	MMBTUannual = (((1/Rexist)-(1/Rnew)) x HDD x 24 x Area) / (1,000,000) X Nheat kWhannual = MMBtuannaul x 293.1 kW = kWhannual x kW/kWhNheating Where: Rexist = Existing effective R-value (R-ExistingInsulation + R-Assembly),ft2-°F/Btuh Rnew = New total effective R-value (R-ProposedMeasure + R-ExistingInsulation + R-Assembly), ft2-°F/Btuh Area = Square footage of insulated area ηheat = Efficiency of the heating system (AFUE or COP) 293.1 = Conversion constant (1MMBtu = 293.1 kWh) 24 = Conversion for hours per day HDD = Heating Degree Days; dependent on location, see table below 1,000,000 = Conversion from Btu to MMBtu kW/kWh heating = Average annual kW reduction per kWh reduction: 0.00050 kW/kWh
Hours	4644
Hours Source	This value is an average BASE 60 Annual Heating Degree Day value for weather stations in Rhode Island and southeastern Massachusetts based on NOAA 30-year data.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.

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measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Energy realization rate is 100% because deemed savings are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	47.31
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	378.05
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.19
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.81
Net-to-Gross source	#N/A
Net-to-Gross note	The Net-to-Gross ratio is Assumed to be 100%.
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIGC154
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Custom
Type	Custom
Sub-type	Custom
Program Name	Commercial and Industrial MultiFamily
Measure Name	Custom
Measure Description	Vendors install a variety of measures at multifamily facilities. Measures include
Baseline Description	For retrofit projects, the baseline efficiency case is the same as the existing, or pre-retrofit, case for the
Savings Principle	The high efficiency scenario is specific to the facility and may include one or more energy efficiency
Energy Savings calculation method	Calc
Savings unit	Completed custom project
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	Calc
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	mult
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	Custom
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	Custom
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC186
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Boiler Control
Program Name	Commercial Retrofit
Measure Name	BOILER RESET 1 STAGE
Measure Description	Boiler reset controls are devices that improve the efficiency of an existing boiler system by modulating the hot water temperature set point. Reset controls automatically control boiler water temperature based on outdoor temperature using a software program; load controls sense the thermal demand of the heating system and resets the water temperature based on the demand.
Baseline Description	The baseline efficiency case is a boiler without reset or load controls.
Savings Principle	The efficient case is a boiler with reset or load controls, which reset the supply water temperature based on outdoor temperatures and/or building load.
Energy Savings calculation method	Deemed
Savings unit	Installation of boiler reset control on existing boiler
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	35.5
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A

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RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC188
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Boiler Control
Program Name	Commercial Retrofit
Measure Name	Boiler reset control (multi
Measure Description	Boiler reset controls are devices that automatically control boiler water temperature based on outdoor temperature using a software program.
Baseline Description	The baseline efficiency case is a boiler without reset controls.
Savings Principle	The high efficiency case is a boiler with reset controls.
Energy Savings calculation method	Deemed
Savings unit	Boiler reset control installed on existing boiler.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	35.5
Gas Heat MMBtu/yr savings source	Environmental Protection Agency (2011). Savings Calculator for ENERGY STAR Qualified Commercial Kitchen Equipment: Steam Cooker Calcs.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	ACEEE (2006). Emerging Technologies Report: Advanced Boiler Controls. Prepared for ACEEE.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	993.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 225 per measure

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TRM Reference Number	RIGC190
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Commercial Retrofit
Measure Name	Programmable thermostat
Measure Description	Installation of programmable thermostats with the ability to adjust heating or air-conditioning operating times according to a pre-set schedule to meet occupancy needs and minimize redundant HVAC operation.
Baseline Description	The baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installed programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	3.2
Gas Heat MMBtu/yr savings source	E-mail correspondence among MA PAs and Ralph Prahl
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	184.97
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 184.97 per measure

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TRM Reference Number	RIGC191
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Commercial and Industrial MultiFamily
Measure Name	Programmable thermostat
Measure Description	Installation of a programmable thermostat which gives the ability to adjust heating or air-conditioning operating times according to a pre-set schedule.
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	The Cadmus Group (2012). Home Energy Services Impact Evaluation. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.24
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.76
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC192
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	Thermostat
Program Name	Commercial and Industrial MultiFamily
Measure Name	Wi-Fi programmable thermostat (controls gas heat only)
Measure Description	A communicating thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling systems Primary Energy Impact: Natural Gas
Baseline Description	For the intallation of a programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating without a programmable thermostat. For the intallation of a wi-fi programmable thermostat, the baseline efficiency case is an HVAC system using natural gas to provide space heating with a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a programmable thermostat or wi-fi programmable thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of WiFi programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A

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RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	5.45
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	51.49
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC193
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	WiFi T-stat
Program Name	Commercial Retrofit
Measure Name	WiFi Thermostat - cooling and htg
Measure Description	A communicating thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling systems.
Baseline Description	The baseline efficiency case is an HVAC system with either a manual or a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a Wi-Fi thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of WiFi programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.60
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC194
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Controls
Sub-type	WiFi T-stat
Program Name	Commercial Retrofit
Measure Name	WiFi Tstat-heat only
Measure Description	A communicating thermostat which allows remote set point adjustment and control via remote application. System requires an outdoor air temperature algorithm in the control logic to operate heating and cooling systems Primary Energy Impact: Natural Gas
Baseline Description	The baseline efficiency case is an HVAC system with either a manual or a programmable thermostat.
Savings Principle	The high efficiency case is an HVAC system that has a Wi-Fi thermostat installed.
Energy Savings calculation method	Deemed
Savings unit	Installation of WiFi programmable thermostat
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	6.60
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	Environmental Protection Agency (2010). Life Cycle Cost Estimate for Programmable Thermostats. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	1.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	1.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC195
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Ducting
Sub-type	Duct Sealing
Program Name	Commercial and Industrial MultiFamily
Measure Name	Duct Sealing
Measure Description	Ducts are sealed by reconnecting disconnected duct joints and sealing gaps or seams with mastic and fiber-mesh tape as appropriate
Baseline Description	The baseline efficiency case is the existing facility or equipment prior to the implementation of duct sealing.
Savings Principle	The baseline efficiency case is the existing facility or equipment after the implementation of duct sealing.
Energy Savings calculation method	Calc
Savings unit	0
Savings Equation	#N/A
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	20
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A

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CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.23
Annual $ savings source / description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
Annual $ savings note	NEI per participant / treated unit
One time $ savings	2.51
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC198
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Commercial and Industrial MultiFamily
Measure Name	Pipe Wrap (Heating)
Measure Description	Insulation upgrades to existing heating system pipes
Baseline Description	The baseline efficiency case is the existing equipment prior to the implementation of additional insulation.
Savings Principle	The high efficiency case includes pipe insulation.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.16
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00

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RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC200
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	HVAC
Type	Steam Traps
Sub-type	Steam Trap
Program Name	Commercial Retrofit
Measure Name	Steam trap HVAC
Measure Description	The repair or replacement of malfunctioning steam traps.
Baseline Description	The baseline efficiency case is a failed steam trap.
Savings Principle	The high efficiency case is a repaired or replaced steam trap.
Energy Savings calculation method	Deemed
Savings unit	Repaired or replaced steam trap.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	25.7
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	6
measure life source	DNV GL MA 2013 Prescriptive Gas Impact Evaluation: Steam Trap Evaulation Phase 1
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	250.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 75 per measure

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TRM Reference Number	RIGC202
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	PArticipant
Type	Participant
Sub-type	C&I MF
Program Name	Commercial and Industrial MultiFamily
Measure Name	Participant
Measure Description	This row identifies a participant for tracking and cost purposes.
Baseline Description	0
Savings Principle	0
Energy Savings calculation method	0
Savings unit	0
Savings Equation	#N/A
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	1
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A

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Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC204
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Faucet Aerator
Program Name	Commercial and Industrial MultiFamily
Measure Name	Faucet aerator
Measure Description	Installation of a faucet aerator with a flow rate of 1.5 GPM or less on an existing faucet with high flow in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is a 2.2 GPM faucet.
Savings Principle	The high efficiency case is a faucet with 1.5 GPM or less aerator installed.
Energy Savings calculation method	Deemed
Savings unit	Installed faucet aerator.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	332.00
Sewer savings: gallons/yr	332.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIGC205
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Commercial and Industrial MultiFamily
Measure Name	Low-flow showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is a 2.5 GPM showerhead.
Savings Principle	The high efficiency case is a 1.5 GPM showerhead.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	Federal Energy Management Program (2010). Energy Cost Calculator for Faucets and Showerheads. Accessed on 10/12/2011.
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	GDS Associates, Inc. and Summit Blue Consulting (2009). Natural Gas Energy Efficiency Potential in Massachusetts. Prepared for GasNetworks.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	3696.00
Sewer savings: gallons/yr	3696.00
Water / Sewer savings Source	The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for the Massachusetts Program Administrators.
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	N/A

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TRM Reference Number	RIGC207
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Spray Valve
Program Name	Commercial Retrofit
Measure Name	Pre-rinse spray valve
Measure Description	Retrofitting existing standard spray nozzles in locations where service water is supplied by natural gas fired hot water heater with new low flow pre-rinse spray nozzles with an average flow rate of 1.6 GPM.
Baseline Description	The baseline efficiency case is a standard efficiency spray valve.
Savings Principle	The high efficiency case is a low flow pre-rinse spray valve with an average flow rate of 1.6 GPM.
Energy Savings calculation method	Deemed
Savings unit	Installed pre-rinse spray valve.
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	8
measure life source	Veritec Consulting (2005). Region of Waterloo Pre-Rinse Spray Valve Pilot Study.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	Realization rate is assumed to be 100% since evaluation adjusts deemed savings value
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A

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Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	6410.00
Sewer savings: gallons/yr	6410.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	100.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 100 per measure

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TRM Reference Number	RIGC211
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Commercial Retrofit
Measure Name	Low-Flow Showerhead
Measure Description	Installation of a low flow showerhead with a flow rate of 1.5 GPM or less in a commercial setting with service water heated by natural gas.
Baseline Description	The baseline efficiency case is a 2.5 GPM showerhead.
Savings Principle	The high efficiency case is a 1.5 GPM showerhead.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A

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Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	7300.00
Sewer savings: gallons/yr	7300.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	200.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 200 per measure

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TRM Reference Number	RIGC212
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Commercial and Industrial MultiFamily
Measure Name	Low Flow Showerhead thermo Control (ladybug gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	435.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC213
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Low Flow Showerhead
Program Name	Commercial and Industrial MultiFamily
Measure Name	Low Flow Showerhead w/thermo Control (roadrunner gas DHW)
Measure Description	A showerhead with a control that limits flow once water is heated.
Baseline Description	The baseline case is a showerhead with a flow of 2.5 gallons per minute, or for the case of the adaper, a low flow showerhead with flow of 1.5 gpm or less.
Savings Principle	The high efficiency is a low-flow showerhead with a control that limits flow once the water is heated.
Energy Savings calculation method	Deemed
Savings unit	Installed low-flow showerhead
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	7
measure life source	#N/A
measure life note	Massachusetts Common Assumption
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	National Grid assumption based on regional PA working groups.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	2888.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.03
One time $ savings source/description	NMR Group, Inc., Tetra Tech (2011). Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation. Prepared for Massachusetts Program Administrators.
One time $ savings note	NEI per participant / treated unit
Free-Ridership	0.15
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.85
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC214
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Flow Control
Sub-type	Demand Circulator
Program Name	Commercial and Industrial MultiFamily
Measure Name	Demand Circulator
Measure Description	Installation of a demand controller on a re-circulation loop.
Baseline Description	Full time operation of re-circ pump.
Savings Principle	The re-circulation pump is controlled by a demand signal or timer to reduce operating hours when no hot water usage occurs.
Energy Savings calculation method	Calc
Savings unit	Installed recirc controller
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	Calculated by RISE Engineering according to algorithms found in The Cadmus Group (2012). Massachusetts 2011 Residential Retrofit Multifamily Program Impact Analysis. Prepared for Massachusetts Program Administrators.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC215
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Water Heating
Type	Insulation
Sub-type	Pipe Insulation
Program Name	Commercial and Industrial MultiFamily
Measure Name	Pipe Wrap (Water Heating)
Measure Description	Installation of DHW pipe wraps
Baseline Description	The baseline efficiency case is the existing hot water equipment.
Savings Principle	The high efficiency case includes pipe wrap.
Energy Savings calculation method	Deemed
Savings unit	0
Savings Equation	Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltaMMBtu_Gas = Average annual natural gas reduction per unit.
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	1.14
Gas Heat MMBtu/yr savings source	Illume and Navigant Consulting (2014). Rhode Island Behaviorial Program and Pilot Impacts and Process Evaluation.
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	15
measure life source	GDS Associates, Inc. (2007). Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures. Prepared for The New England State Program Working Group.
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	1.00
RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00

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CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	#N/A
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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TRM Reference Number	RIGC216
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	BOC Training
Sub-type	Certification
Program Name	Commercial Retrofit
Measure Name	Building operator certification
Measure Description	The Building Operator Certificaiton (BOC) class improves operators' ability to optimize / minimize gas and electricity use in buildings.
Baseline Description	The basecase is a building operator without specific training on efficient use of gas and electricity in buildings.
Savings Principle	The high efficiency case is a building operator attending a class on improving the efficiency of gas and electricity use in buildings.
Energy Savings calculation method	Deemed
Savings unit	MMBTU/SF/BOC completion
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.0007
Gas Heat MMBtu/yr savings source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.06
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.94
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1695.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1250 per measure

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TRM Reference Number	RIGC217
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	BOC Training
Sub-type	Certification + capital improvements
Program Name	Commercial Retrofit
Measure Name	Building operator certification + capital improvements
Measure Description	The Building Operator Certificaiton (BOC) class improves operators' ability to optimize / minimize gas and electricity use in buildings.
Baseline Description	The basecase is a building operator without specific training on efficient use of gas and electricity in buildings.
Savings Principle	The high efficiency case is a building operator attending a class on improving the efficiency of gas and electricity use in buildings, as well as capital investments in EE projects.
Energy Savings calculation method	Deemed
Savings unit	MMBTU/SF/BOC completion
Savings Equation	Gross kWh = Qty × deltakWh Gross kW = Qty × deltakW Gross MMBtu_Gas = Qty × deltaMMBtu_Gas Where: Qty = Total number of units. deltakWh = Average annual kWh reduction per unit. deltakW = Average kW reduction per unit. deltaMMBtu_Gas = Average annual natural gas reduction per unit
Hours	N/A
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	0
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	0
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	0.0011
Gas Heat MMBtu/yr savings source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	0
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	5
measure life source	Navigant Consulting (2015). Comprehensive Review of Non-Residential Training and Education Programs, with a Focus on Building Operator Certification. Prepared for the Massachusetts Program Administrators and the Energy Efficiency Advisory Council
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	All installations have 100% in-service rate since programs include verification of equipment installations.
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	Savings persistence is assumed to be 100%.
Realization rate energy (RRe)	0.00

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RRe source	#N/A
RRe note	Realization rate is 100% since gross savings values are based on evaluation results.
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A
CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.00
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	1.00
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	1695.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	$ 1250 per measure

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TRM Reference Number	RIGC220
Fuel	Gas
Sector	C&I
Project Type	Retrofit
Category	Whole Building
Type	Insulation
Sub-type	Roof
Program Name	Commercial Retrofit
Measure Name	ROOF INSULATION
Measure Description	Installation of roof insulation in existing facilities.
Baseline Description	The basecase is the existing roof insulation level.
Savings Principle	The high efficiency case is the installed insulation level.
Energy Savings calculation method	Calculated using site-specific inputs
Savings unit	Completed insulation project.
Savings Equation	Gross kWh = deltakWh_custom Gross Summer kW = deltakW_sp_custom Gross Winter kW = deltakW_wp_custom Gross MMBtu Gas = deltaMMBtu_Gas_custom Gross MMBtu Oil = deltaMMBtu_Oil_custom
Hours	0
Hours Source	#N/A
Hours source note	#N/A
kWh/yr Savings	Calc
kWh/yr savings source	#N/A
kWh/yr savings note	#N/A
kW reduction	Calc
kW reduction source	#N/A
kW reduction note	#N/A
Gas Heat MMBtu/yr savings	Calc
Gas Heat MMBtu/yr savings source	#N/A
Gas Heat MMBtu/yr savings note	#N/A
Oil MMBtu/yr savings	Calc
Oil MMBtu/yr savings source	#N/A
Oil MMBtu/yr savings note	#N/A
Propane MMBtu/yr savings	0
Propane MMBtu/yr savings source	#N/A
Propane MMBtu/yr savings note	#N/A
Energy Reference(s) & table(s) notes	0
measure life	25
measure life source	#N/A
measure life note	#N/A
In-service rate (ISR)	1.00
In-service rate source	#N/A
In-service rate note	#N/A
Savings Persistence Factor (SPF)	1.00
Savings Persistence Factor source	#N/A
Savings Persistence Factor note	#N/A
Realization rate energy (RRe)	0.00
RRe source	#N/A
RRe note	#N/A
RR demand (RRd) summer peak	0.00
RRd summer peak source	#N/A
RRd summer peak note	#N/A
RR demand (RRd) winter peak	0.00
RRd winter peak source	#N/A
RRd winter peak note	#N/A
Coincidence factor (CF) summer peak	0.00
CF summer peak source	#N/A
CF summer peak note	#N/A
Coincidence factor (CF) winter peak	0.00
CF winter peak source	#N/A

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CF winter peak note	#N/A
Water savings: gallons/yr	0.00
Sewer savings: gallons/yr	0.00
Water / Sewer savings Source	#N/A
Water / Sewer savings note	#N/A
Annual $ savings	0.00
Annual $ savings source / description	#N/A
Annual $ savings note	#N/A
One time $ savings	0.00
One time $ savings source/description	#N/A
One time $ savings note	#N/A
Free-Ridership	0.23
Spill-Over (participant)	0.00
Spill-Over (non-participant)	0.00
Net-to-Gross	0.78
Net-to-Gross source	TetraTech (2015) 2013-14 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015
Net-to-Gross note	#N/A
Gross Measure TRC unit	0.00
Gross Measure TRC source	#N/A
Gross Measure TRC note	#N/A
Incentive Unit	0.00

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Appendix A: Tables

Table 1: Lighting Power Densities Using the Building Area Method (WATTSb,i)

Building Area Type	Lighting Power Density (W/ft2) [1]
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Dining: Bar Lounge/Leisure	1.3
Dining: Cafeteria/Fast Food	1.4
Dining: Family	1.6
Dormitory	1
Fire Stations	0.8
Exercise Center	1
Gymnasium	1.1
Healthcare-Clinic	1
Hospital	1.2
Hotel	1
Library	1.3
Manufacturing Facility	1.3
Motel	1
Motion Picture Theatre	1.2
Multi-Family	0.7
Museum	1.1
Office	0.9
Parking Garage	0.3
Penitentiary	1
Performing Arts Theatre	1.6
Police/Fire Station	1
Post Office	1.1
Religious Building	1.3
Retail	1.4
School/University	1.2
Sports Arena	1.1
Town Hall	1.1
Transportation	1
Warehouse	0.6
Workshop	1.4

[1] IECC 2012

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Table 2: Lighting Power Densities Using the Space-by-Space Method (WATTSb,i)

Common Space Types	**Lighting Power Density (W/ft^2)**
Atrium – First 40 feet in height	0.03 per ft. ht.
Atrium – Above 40 feet in height	0.02 per ft. ht.
Audience/seating	
For Auditorium	0.9
For performing arts theater	2.6
For motion picture theater	1.2
Classroom/lecture/training	1.3
Conference/meeting/multipurpose	1.2
Corridor/transition	0.7
Dining Area	0.9
Bar/lounge/leisure dining	1.4
Family dining area	1.4
Dressing/fitting room performing arts theater	1.1
Electrical/mechanical	1.1
Food preparation	1.2
Laboratory for classrooms	1.3
Laboratory for medical/industrial/research	1.8
Lobby	1.1
Lobby for performing arts theater	3.3
Lobby for motion picture theater	1
Locker room	0.8
Lounge/Recreation	0.8
Office - enclosed	1.1
Office – open plan	1
Restroom	1
Sales area	1.6
Stairway	0.7
Storage	0.8
Workshop	1.6
Courthouse/police station/penitentiary	
Courtroom	1.9
Confinement cells	1.1
Judge Chambers	1.3
Penitentiary audience seating	0.5
Penitentiary classroom	1.3
Penitentiary dining	1.1
BUILDING SPECIFIC SPACE-BY-SPACE TYPES	
Automotive – service/repair	0.7
Bank/office – banking activity area	1.5
Dormitory living quarters	1.1
Gymnasium/fitness center	

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Fitness area	0.9
Gymnasium audience/seating	0.4
Playing area	1.4
COMMON SPACE-BY-SPACE TYPES	1.4
Healthcare clinic/hospital	
Corridors/transition	1
Exam/treatment	1.7
Emergency	0.8
Public and staff lounge	0.8
Medical Supplies	1.4
Nursery	0.9
Nurse Station	1
Physical Therapy	0.9
Patient room	0.7
Pharmacy	1.2
Radiology/imaging	1.3
Operating room	2.2
Recovery	1.2
Lounge Recreation	0.8
Laundry – washing	0.6
Hotel	
Dining area	1.3
Guest rooms	1.1
Hotel lobby	2.1
Highway lodging dining	1.2
Highway lodging guest rooms	1.1
Library	
Stacks	1.7
Card File and cataloguing	1.1
Reading area	1.2
Manufacturing	
Corridors/transition	0.4
Detailed Manufacturing	1.3
Equipment Room	1
Extra high bay (> 50-foot floor-ceiling height)	1.1
High bay (25 – 50-foot floor-ceiling height)	1.2
Low bay (< 25-foot floor-ceiling height)	1.2
Museum	
General Exhibition	1
Restoration	1.7
Parking Garage – garage areas	0.2
Convention Center	
Exhibit space	1.5
Audience/seating area	0.9
Fire Stations	
Engine Room	0.8
Sleeping quarters	0.3

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Post Office	
Sorting area	0.9
Religious building	
Fellowship hall	0.6
Audience seating	2.4
Worship pulpit/choir	2.4
Retail	
Dressing/fitting area	0.9
Mall concourse	1.6
Sales area	1.6
BUILDING SPECIFIC SPACE-BY-SPACE TYPES	
Sports areana	
Audience seating	0.4
Court sports area – Class 4	0.7
Court sports area – Class 3	1.2
Court sports area – Class 2	1.9
Court sports area – Class 1	3
Ring sports area	2.7
Transportation	
Air/train/bus baggage area	1
Airport concourse	0.6
Terminal – ticket counter	1.5
Warehouse	
Fine material storage	1.4
Medium/bulky material	0.6

[1] IECC 2012

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Table 3: New Construction Proposed Lighting Wattage Tables

Device Code	Device Description	Rated Watts
LED Exit Signs		
1E0002	2.0 WATT LED	2
1E0003	3.0 WATT LED	3
1E0005	5.0 WLED	5
1E0005C	0.5 WATT LEC	0.5
1E0008	8.0 WLED	8
1E0015	1.5 WATT LED	1.5
1E0105	10.5 WATT LED	10.5
Compact Fluorescents (CFL's)		
2C0007S	2/7W COMPACT HW	18
1C0005S	5W COMPACT HW	7
1C0007S	7W COMPACT HW	9
1C0009S	9W COMPACT HW	11
1C0011S	11W COMPACT HW	13
1C0013S	13W COMPACT HW	15
1C0018E	18W COMPACT HW ELIG	20
1C0018S	18W COMPACT HW	20
1C0022S	22W COMPACT HW	24
1C0023E	1/23W COMPACT HW ELIG	25
1C0026E	26W COMPACT HW ELIG	28
1C0026S	26W COMPACT HW	28
1C0028S	28W COMPACT HW	30
1C0032E	32W COMPACT HW ELIG	34
1C0032S	32W CIRCLINE HW	34
1C0042E	1/42W COMPACT HW ELIG	48
1C0044S	44W CIRCLINE HW	46
1C0057E	1/57W COMPACT HW ELIG	65
1C2232S	22/32W CIRCLINE HW	58
1C2D10E	10W 2D COMPACT HW ELIG	12
1C2D16E	16W 2D COMPACT HW ELIG	18
1C2D21E	21W 2D COMPACT HW ELIG	22
1C2D28E	28W 2D COMPACT HW ELIG	28
1C2D38E	38W 2D COMP.HW ELIG	36

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Device Code	Device Description	Rated Watts
Compact Fluorescents (CFL's) (cont)		
1C3240S	32/40W CIRCLINE HW	80
2C0005S	2/5W COMPACT HW	14
2C0009S	2/9W COMPACT HW	22
2C0011S	2/11W COMPACT HW	26
2C0013E	2/13W COMPACT HW ELIG	28
2C0013S	2/13W COMPACT HW	30
2C0018E	2/18W COMP. HW ELIG	40
2C0026E	2/26W COMP. HW ELIG	54
2C0032E	2/32W COMPACT HW ELIG	68
2C0042E	2/42W COMPACT HW ELIG	100
3C0009S	3/9W COMPACT HW	33
3C0013S	3/13W COMPACT HW	45
3C0018E	3/18W COMPACT HW ELIG	60
3C0026E	3/26W COMPACT HW ELIG	82
3C0032E	3/32W COMPACT HW ELIG	114
3C0042E	3/42W COMPACT HW ELIG	141
4C0018E	4/18W COMPACT HW ELIG	80
4C0026E	4/26W COMPACT HW ELIG	108
4C0032E	4/32W COMPACT HW ELIG	152
4C0042E	4/42W COMPACT HW ELIG	188
6C0026E	6/26W COMPACT HW ELIG	162
6C0032E	6/32W COMPACT HW ELIG	228
6C0042E	6/42W COMPACT HW ELIG	282
8C0026E	8/26W COMPACT HW ELIG	216
8C0032E	8/32W COMPACT HW ELIG	304
8C0042E	8/42W COMPACT HW ELIG	376
T5 Systems		
1F14SSE	1L2' 14W T5/ELIG	16
2F14SSE	2L2' 14W T5/ELIG	32
3F14SSE	3L2' 14W T5/ELIG	50
4F14SSE	4L2' 14W T5/ELIG	68
1F24HSE	1L2' 24W T5HO/ELIG	29
2F24HSE	2L2' 24W T5HO/ELIG	52
3F24HSE	3L2' 24W T5HO/ELIG	80

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Device Code	Device Description	Rated Watts
	T5 Systems (cont.)	
1F21SSE	1L3' 21W T5/ELIG	24
2F21SSE	2L3' 21W T5/ELIG	47
1F39HSE	1L3' 39W T5HO/ELIG	42
2F39HSE	2L3' 39W T5HO/ELIG	85
1F28SSE	1L4' 28W T5/ELIG	32
2F28SSE	2L4' 28W T5/ELIG	63
3F28SSE	3L4' 28W T5/ELIG	95
4F28SSE	4L4' 28W T5/ELIG	126
6F28SSE	6L4' 28W T5/ELIG	189
1F47HSE	1L4' 47W T5HO/ELIG	53
2F47HSE	2L4' 47W T5HO/ELIG	103
3F47HSE	3L4' 47W T5HO/ELIG	157
4F47HSE	4L4' 47W T5HO/ELIG	200
5F47HSE	5L4' 47W T5HO/ELIG	260
6F47HSE	6L4' 47W T5HO/ELIG	303
1F50HSE	1L4' 50W T5HO/ELIG	58
2F50HSE	2L4' 50W T5HO/ELIG	110
3F50HSE	3L4' 50W T5HO/ELIG	168
4F50HSE	4L4' 50W T5HO/ELIG	215
5F50HSE	5L4' 50W T5HO/ELIG	278
6F50HSE	6L4' 50W T5HO/ELIG	325
1F54HSE	1L4' 54W T5HO/ELIG	59
2F54HSE	2L4' 54W T5HO/ELIG	117
3F54HSE	3L4' 54W T5HO/ELIG	177
4F54HSE	4L4’ 54W T5HO/ELIG	234
5F54HSE	5L4' 54W T5HO/ELIG	294
6F54HSE	6L4’ 54W T5HO/ELIG	351
8F54HSE	8L4' 54W T5HO/ELIG	468
10F54HSE	10L4’ 54W T5HO/ELIG	585
	Two Foot High Efficient T8 Systems	
1F17ESL	1L2' 17W T8EE/ELEE LOW PWR	14
1F17ESN	1L2' 17W T8EE/ELEE	17
1F17ESH	1L2' 17W T8EE/ELEE HIGH PWR	20
1F28BXE	1L2' F28BX/ELIG	32

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Device Code	Device Description	Rated Watts
2F17ESL	2L2' 17W T8EE/ELEE LOW PWR	27
2F17ESN	2L2' 17W T8EE/ELEE	32
2F17ESH	2L2' 17W T8EE/ELEE HIGH PWR	40
2F28BXE	2L2' F28BX/ELIG	63
3F17ESL	3L2' 17W T8EE/ELEE LOW PWR	39
3F17ESN	3L2' 17W T8EE/ELEE	46
3F17ESH	3L2' 17W T8EE/ELEE HIGH PWR	61
3F28BXE	3L2' F28BX/ELIG	94
Three Foot High Efficient T8 Systems		
1F25ESL	1L3' 25W T8EE/ELEE LOW PWR	21
1F25ESN	1L3' 25W T8EE/ELEE	24
1F25ESH	1L3' 25W T8EE/ELEE HIGH PWR	30
2F25ESL	2L3' 25W T8EE/ELEE LOW PWR	40
2F25ESN	2L3' 25W T8EE/ELEE	45
2F25ESH	2L3' 25W T8EE/ELEE HIGH PWR	60
3F25ESL	3L3' 25W T8EE/ELEE LOW PWR	58
3F25ESN	3L3' 25W T8EE/ELEE	67
3F25ESH	3L3' 25W T8EE/ELEE HIGH PWR	90
Four Foot T8 High Efficient / Reduce Wattage Systems		
1F25EEH	1L4' 25W T8EE/ELEE HIGH PWR	30
1F25EEE	1L4' 25W T8EE/ELEE	22
1F25EEL	1L4' 25W T8EE/ELEE LOW PWR	19
2F25EEH	2L4' 25W T8EE/ELEE HIGH PWR	57
2F25EEE	2L4' 25W T8EE/ELEE	43
2F25EEL	2L4' 25W T8EE/ELEE LOW PWR	37
3F25EEH	3L4' 25W T8EE/ELEE HIGH PWR	86
3F25EEE	3L4' 25W T8EE/ELEE	64
3F25EEL	3L4' 25W T8EE/ELEE LOW PWR	57
4F25EEH	4L4' 25W T8EE/ELEE HIGH PWR	111
4F25EEE	4L4' 25W T8EE/ELEE	86
4F25EEL	4L4' 25W T8EE/ELEE LOW PWR	75
1F28EEH	1L4' 28W T8EE/ELEE HIGH PWR	33
1F28EEE	1L4' 28W T8EE/ELEE	24
1F28EEL	1L4' 28W T8EE/ELEE LOW PWR	22
2F28EEH	2L4' 28WT8EE/ELEE HIGH PWR	64

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Device Code	Device Description	Rated Watts
2F28EEE	2L4' 28W T8EE/ELEE	48
2F28EEL	2L4' 28W T8EE/ELEE LOW PWR	42
3F28EEH	3L4' 28W T8EE/ELEE HIGH PWR	96
3F28EEE	3L4' 28W T8EE/ELEE	72
3F28EEL	3L4' 28W T8EE/ELEE LOW PWR	63
4F28EEH	4L4' 28W T8EE/ELEE HIGH PWR	126
4F28EEE	4L4' 28W T8EE/ELEE	94
4F28EEL	4L4' 28W T8EE/ELEE LOW PWR	83
1F30EEH	1L4' 30W T8EE/ELEE HIGH PWR	36
1F30EEE	1L4' 30W T8EE/ELEE	26
1F30EEL	1L4' 30W T8EE/ELEE LOW PWR	24
2F30EEH	2L4' 30WT8EE/ELEE HIGH PWR	69
2F30EEE	2L4' 30W T8EE/ELEE	52
2F30EEL	2L4' 30W T8EE/ELEE LOW PWR	45
3F30EEH	3L4' 30W T8EE/ELEE HIGH PWR	103
3F30EEE	3L4' 30W T8EE/ELEE	77
3F30EEL	3L4' 30W T8EE/ELEE LOW PWR	68
Four Foot T8 High Efficient / Reduce Wattage Systems (cont.)		
4F30EEH	4L4' 30W T8EE/ELEE HIGH PWR	133
4F30EEE	4L4' 30W T8EE/ELEE	101
4F30EEL	4L4' 30W T8EE/ELEE LOW PWR	89
1F32EEH	1L4' 32W T8EE/ELEE HIGH PWR	38
1F32EEE	1L4' 32W T8EE/ELEE	28
1F32EEL	1L4' 32W T8EE/ELEE LOW PWR	25
2F32EEH	2L4' 32W T8EE/ELEE HIGH PWR	73
2F32EEE	2L4' 32W T8EE/ELEE	53
2F32EEL	2L4' 32W T8EE/ELEE LOW PWR	47
3F32EEH	3L4' 32W T8EE/ELEE HIGH PWR	109
3F32EEE	3L4' 32W T8EE/ELEE	82
3F32EEL	3L4' 32W T8EE/ELEE LOW PWR	72
4F32EEH	4L4' 32W T8EE/ELEE HIGH PWR	141
4F32EEE	4L4' 32W T8EE/ELEE	107
4F32EEL	4L4' 32W T8EE/ELEE LOW PWR	95
6F32EEH	6L4' 32W T8EE/ELEE HIGH PWR	218
6F32EEE	6L4' 32W T8EE/ELEE	168
6F32EEL	6L4' 32W T8EE/ELEE LOW PWR	146

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Device Code	Device Description	Rated Watts
Eight Foot T8 Systems		
1F59SSE	1L8' T8/ELIG	60
1F80SSE	1L8' T8 HO/ELIG	85
2F59SSE	2L8' T8/ELIG	109
2F59SSL	2L8' T8/ELIG LOW PWR	100
2F80SSE	2L8' T8 HO/ELIG	160
LED Lighting Fixtures		
1L002	2 WATT LED	2
1L003	3 WATT LED	3
1L004	4 WATT LED	4
1L005	5 WATT LED	5
1L006	6 WATT LED	6
1L007	7 WATT LED	7
1L008	8 WATT LED	8
1L009	9 WATT LED	9
1L010	10 WATT LED	10
1L011	11 WATT LED	11
1L012	12 WATT LED	12
1L013	13 WATT LED	13
1L014	14 WATT LED	14
1L015	15 WATT LED	15
1L016	16 WATT LED	16
1L017	17 WATT LED	17
LED Lighting Fixtures (cont.)		
1L018	18 WATT LED	18
1L019	19 WATT LED	19
1L020	20 WATT LED	20
1L021	21 WATT LED	21
1L022	22 WATT LED	22
1L023	23 WATT LED	23
1L024	24 WATT LED	24
1L025	25 WATT LED	25
1L026	26 WATT LED	26
1L027	27 WATT LED	27
1L028	28 WATT LED	28
1L029	29 WATT LED	29

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Device Code	Device Description	Rated Watts
1L030	30 WATT LED	30
1L031	31 WATT LED	31
1L032	32 WATT LED	32
1L033	33 WATT LED	33
1L034	34 WATT LED	34
1L035	35 WATT LED	35
1L036	36 WATT LED	36
1L037	37 WATT LED	37
1L038	38 WATT LED	38
1L039	39 WATT LED	39
1L040	40 WATT LED	40
1L041	41 WATT LED	41
1L042	42 WATT LED	42
1L043	43 WATT LED	43
1L044	44 WATT LED	44
1L045	45 WATT LED	45
1L046	46 WATT LED	46
1L047	47 WATT LED	47
1L048	48 WATT LED	48
1L049	49 WATT LED	49
1L050	50 WATT LED	50
1L055	55 WATT LED	55
1L060	60 WATT LED	60
1L070	70 WATT LED	70
1L073	73 WATT LED	73
1L075	75 WATT LED	75
1L080	90 WATT LED	90
1L085	85 WATT LED	85
1L090	90 WATT LED	90
LED Lighting Fixtures (cont.)		
1L095	95 WATT LED	95
1L100	100 WATT LED	100
1L106	106 WATT LED	106
1L107	107 WATT LED	107
1L116	116 WATT LED	116
1L120	120 WATT LED	120
1L125	125 WATT LED	125

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1L130	130 WATT LED	130
1L135	135 WATT LED	135
1L140	140 WATT LED	140
1L145	145 WATT LED	145
1L150	150 WATT LED	150
1L155	155 WATT LED	155
1L160	160 WATT LED	160
1L165	165 WATT LED	165
1L170	170 WATT LED	170
1L175	175 WATT LED	175
1L180	180 WATT LED	180
1L185	185 WATT LED	185
1L190	190 WATT LED	190
1L200	200 WATT LED	200
1L210	210 WATT LED	210
1L220	220 WATT LED	220
1L240	240 WATT LED	240
Electronic Metal Halide Lamps		
1M0150E	150W METAL HALIDE EB	160
1M0200E	200W METAL HALIDE EB	215
1M0250E	250W METAL HALIDE EB	270
1M0320E	320W METAL HALIDE EB	345
1M0350E	350W METAL HALIDE EB	375
1M0400E	400W METAL HALIDE EB	430
1M0450E	400W METAL HALIDE EB	480
MH Track Lighting		
1M0020E	20W MH SPOT	25
1M0025E	25W MH SPOT	25
1M0035E	35W MH SPOT	44
1M0039E	39W MH SPOT	47
1M0050E	50W MH SPOT	60
1M0070E	70W MH SPOT	80
1M0100E	100W MH SPOT	111
1M0150E	150W MH SPOT	162

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Table 4: Retrofit Existing Lighting Wattage Tables

Device Code	Device Description	Rated Watts
Incandescent Lamps		
1I0015	15W INC	15
1I0020	20W INC	20
1I0025	25W INC	25
1I0034	34W INC	34
1I0036	36W INC	36
1I0040	40W INC	40
1I0042	42W INC	42
1I0045	45W INC	45
1I0050	50W INC	50
1I0052	52W INC	52
1I0054	54W INC	54
1I0055	55W INC	55
1I0060	60W INC	60
1I0065	65W INC	65
1I0067	67W INC	67
1I0069	69W INC	69
1I0072	72W INC	72
1I0075	75W INC	75
1I0080	80W INC	80
1I0085	85W INC	85
1I0090	90W INC	90
1I0093	93W INC	93
1I0100	100W INC	100
1I0120	120W INC	120
1I0125	125W INC	125
1I0135	135W INC	135
1I0150	150W INC	150
1I0200	200W INC	200
1I0300	300W INC	300
1I0448	448W INC	448
1I0500	500W INC	500
1I0750	750W INC	750
1I1000	1000W INC	1000
1I1500	1500W INC	1500
Low Voltage Halogen Fixture (includes Transformer)		
1R0020	20W LV HALOGEN FIXT	30
1R0025	25W LV HALOGEN FIXT	35
1R0035	35W LV HALOGEN FIXT	45
Low Voltage Halogen Fixture (includes Transformer) (cont.)		
1R0042	42W LV HALOGEN FIXT	52
1R0050	50W LV HALOGEN FIXT	60
1R0065	65W LV HALOGEN FIXT	75
1R0075	75W LV HALOGEN FIXT	85
Halogen/Quartz Lamps		

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Device Code	Device Description	Rated Watts
1T0035	35W HALOGEN LAMP	35
1T0040	40W HALOGEN LAMP	40
1T0042	42W HALOGEN LAMP	42
1T0045	45W HALOGEN LAMP	45
1T0047	47W HALOGEN LAMP	47
1T0050	50W HALOGEN LAMP	50
1T0052	52W HALOGEN LAMP	52
1T0055	55W HALOGEN LAMP	55
1T0060	60W HALOGEN LAMP	60
1T0072	72W HALOGEN LAMP	72
1T0075	75W HALOGEN LAMP	75
1T0090	90W HALOGEN LAMP	90
1T0100	100W HALOGEN LAMP	100
1T0150	150W HALOGEN LAMP	150
1T0200	200W HALOGEN LAMP	200
1T0250	250W HALOGEN LAMP	250
1T0300	300W HALOGEN LAMP	300
1T0350	350W HALOGEN LAMP	350
1T0400	400W HALOGEN LAMP	400
1T0425	425W HALOGEN LAMP	425
1T0500	500W HALOGEN LAMP	500
1T0750	750W HALOGEN LAMP	750
1T0900	900W HALOGEN LAMP	900
1T1000	1000W HALOGEN LAMP	1000
1T1200	1200W HALOGEN LAMP	1200
1T1500	1500W HALOGEN LAMP	1500
Mercury Vapor (MV)		
1V0040S	40W MERCURY	50
1V0050S	50W MERCURY	75
1V0075S	75W MERCURY	95
1V0100S	100W MERCURY	120
1V0175S	175W MERCURY	205
1V0250S	250W MERCURY	290
1V0400S	400W MERCURY	455
Low Pressure Sodium (LPS)		
1V0700S	700W MERCURY	775
1V1000S	1000W MERCURY	1075
2V0400S	2/400W MERCURY	880
1L0035S	35W LPS	60
1L0055S	55W LPS	85
1L0090S	90W LPS	130
1L0135S	135W LPS	180
1L0180S	180W LPS	230
High Pressure Sodium (HPS)		
1H0035S	35W HPS	45
1H0050S	50W HPS	65
1H0070S	70W HPS	90
1H0100S	100W HPS	130

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Device Code	Device Description	Rated Watts
1H0150S	150W HPS	190
1H0200S	200W HPS	240
1H0225S	225W HPS	275
1H0250S	250W HPS	295
1H0310S	310W HPS	350
1H0360S	360W HPS	435
1H0400S	400W HPS	460
1H0600S	600W HPS	675
1H0750S	750W HPS	835
1H1000S	1000W HPS	1085
Metal Halide (MH)		
1M0032S	32W METAL HALIDE	40
1M0050S	50W METAL HALIDE	65
1M0070S	70W METAL HALIDE	95
1M0100S	100W METAL HALIDE	120
1M0150S	150W METAL HALIDE	190
1M0175S	175W METAL HALIDE	205
1M0250S	250W METAL HALIDE	295
1M0360S	360W METAL HALIDE	430
1M0400S	400W METAL HALIDE	455
1M0750S	750W METAL HALIDE	825
1M1000S	1000W METAL HALIDE	1075
1M1500S	1500W METAL HALIDE	1615
1M1800S	1800W METAL HALIDE	1875
Pulse Start Metal Halide Lamp/Ballast		
1M0100P	100W MH CWA	128
1M0100R	100W MH LINEAR	118
1M0150P	150W MH CWA	190
1M0150R	150W MH LINEAR	172
1M0175P	175W MH CWA	208
1M0175R	175W MH LINEAR	190
1M0200P	200W MH CWA	232
1M0200R	200W MH LINEAR	218
1M0250P	250W MH CWA	288
1M0250R	250W MH LINEAR	265
1M0300P	300W MH CWA	342
1M0300R	300W MH LINEAR	324
1M0320P	320W MH CWA	365
1M0320R	320W MH LINEAR	345
1M0350P	350W MH CWA	400
1M0350R	350W MH LINEAR	375
1M0400P	400W MH CWA	455
1M0400R	400W MH LINEAR	430
1M0450P	450W MH CWA	508
1M0450R	450W MH LINEAR	480
1M0750P	750W MH CWA	815
1M0750R	750W MH LINEAR	805
1M0875P	875W MH CWA	950

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Device Code	Device Description	Rated Watts
1M0875R	875W MH LINEAR	927
1M1000P	1000W MH CWA	1080
Two Foot T8 / T12 Systems		
1F20SSS	F20T12/HPF(1)	32
1F80BXE	1L2' F80BXE/ELIG	90
1F55BXE	1L2' F55BX/ELIG	56
2F17SSE	2L2' 17W T8/ELIG	37
2F17SSL	2L2' 17W T8/ELIG LOW POWER	27
2F17SSM	2L2' 17W T8/EEMAG	45
2F20SSS	F20T12/HPF(2)	56
2F24HSS	2L2' 24 T12HO/STD/STD	85
2F40BXE	2L2' F40BX/ELIG	72
2F50BXE	2L2' F50BX/ELIG	108
2F55BXE	2L2'55BXE/ELIG	112
3F17SSE	3L2' 17W T8/ELIG	53
3F17SSL	3L2' 17W T8/ELIG LOW POWER	39
Two Foot T8 / T12 Systems (cont.)		
3F20SSS	F20T12/HPF(3)	78
3F40BXE	3L2' F40BX/ELIG	102
3F50BXE	3L2' F50BX/ELIG	162
3F55BXE	3L2' F55BX/ELIG	168
4F17SSE	4L2' 17W T8/ELIG	62
4F36BXE	4L2' F36BX/ELIG	148
4F40BXE	4L2' F40BX/ELIG	144
4F40BXH	4L 40W T5 (Std.) HIGH LMN	170
4F50BXE	4L2' F50BX/ELIG	216
4F55BXE	4L2' F55BX/ELIG	224
5F40BXE	5L2' F40BX/ELIG	190
5F50BXE	5L2' F50BX/ELIG	270
5F55BXE	5L2' F55BX/ELIG	280
6F36BXE	6L2' F36BX/ELIG	212
6F40BXE	6L2' F40BX/ELIG	204
6F50BXE	6L2' F50BX/ELIG	324
6F55BXE	6L2' F55BX/ELIG	336
8F36BXE	8L2' F36BX/ELIG	296
8F40BXE	8L2' F40BX/ELIG	288
8F50BXE	8L2' F50BX/ELIG	432
8F55BXE	8L2' F55BX/ELIG	448
9F36BXE	9L2' F36BX/ELIG	318
9F40BXE	9L2' F40BX/ELIG	306
9F50BXE	9L2' F50BX/ELIG	486
9F55BXE	9L2' F55BX/ELIG	504
12F40BE	12L2' F40BX/ELIG	408
12F50BE	12L2' F50BX/ELIG	648
12F55BE	12L2' F55BX/ELIG	672
Three Foot T8 / T12 Systems		
1F30SEM	1L3' 30W T12 EE/EEMAG	38

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Device Code	Device Description	Rated Watts
1F30SES	1L3' 30W T12 EE/STD	42
1F30SSS	1L3' 30W T12 STD/STD	46
1F25SSE	1L3' 25W T8/ELIG	24
1F25SSH	1L3' 25W T8/ELIG HIGH LMN	28
2F30SEE	2L3' 30W T12 EE/ELIG	49
2F30SEM	2L3' 30W T12 EE/EEMAG	66
2F30SES	2L3' 30W T12 EE/STD	73
2F30SSS	2L3' 30W T12 STD/STD	80
2F25SSE	2L3' 25W T8/ELIG	47
2F25SSM	2L3' 25W T8/EEMAG	65
Three Foot T8 / T12 Systems		
3F30SSS	3L3' 30W T12 STD/STD	140
3F30SES	3L3' 30W T12 EE/STD	127
3F25SSE	3L3’ 25W T8/ELIG	68
4F25SSE	4L3' 25W T8/ELIG	88
Four Foot F48 T8 Systems		
1F48SES	1L4' F48T12EE/STD	50
1F48SSS	1L4' F48T12/STD	60
2F48SES	2L4' F48T12EE/STD	82
2F48SSS	2L4' F48T12/STD	102
3F48SES	3L4' F48T12EE/STD	132
3F48SSS	3L4' F48T12/STD	162
4F48SES	4L4' F48T12EE/STD	164
4F48SSS	4L4' F48T12/STD	204
1F48HES	1L4' F48HO/EE/STD	80
1F48HSS	1L4' F48H0/STD/STD	85
2F48HES	2L4' F48HO/EE/STD	135
2F48HSS	2L4' F48H0/STD/STD	145
3F48HES	3L4' F48HO/EE/STD	215
3F48HSS	3L4' F48H0/STD/STD	230
4F48HES	4L4' F48HO/EE/STD	270
4F48HSS	4L4' F48H0/STD/STD	290
Four Foot F48VHO T12 Systems		
1F48VES	1L4' F48VHO/EE/STD	123
1F48VSS	1L4' F48VHO/STD/STD	138
2F48VES	2L4' F48VHO/EE/STD	210
2F48VSS	2L4' F48VHO/STD/STD	240
3F48VES	3L4' F48VHO/EE/STD	333
3F48VSS	3L4' F48VHO/STD/STD	378
4F48VES	4L4' F48VHO/EE/STD	420
4F48VSS	4L4' F48VHO/STD/STD	480
Four Foot T12 Systems		
1F40SEE	1L4' EE/ELIG	38
1F40SEM	1L4' EE/EEMAG	40
1F40SES	1L4' EE/STD	50
1F40SSE	1L4' STD/ELIG	46

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Device Code	Device Description	Rated Watts
1F40SSM	1L4' STD/EEMAG	50
1F40SSS	1L4' STD/STD	57
1F40HSE	1L4' HO/STD/ELIG	59
Four Foot T12 Systems (cont.)		
2F40SEE	2L4' EE/ELIG	60
2F40SEM	2L4' EE/EEMAG	70
2F40SES	2L4' EE/STD	80
2F40SSE	2L4' STD/ELIG	72
2F40SSM	2L4' STD/EEMAG	86
2F40SSS	2L4' STD/STD	94
3F40SEE	3L4' EE/ELIG	90
3F40SEM	3L4' EE/EEMAG	110
3F40SES	3L4' EE/STD	130
3F40SSE	3L4' STD/ELIG	110
3F40SSM	3L4' STD/EEMAG	136
3F40SSS	3L4' STD/STD	151
4F40SEE	4L4' EE/ELIG	120
4F40SEM	4L4' EE/EEMAG	140
4F40SES	4L4' EE/STD	160
4F40SSE	4L4' STD/ELIG	144
4F40SSM	4L4' STD/EEMAG	172
4F40SSS	4L4' STD/STD	188
6F40SSS	6L4' STD/STD	282
Four Foot T8 Systems		
1F32SSE	1L4' T8/ELIG	30
1F32SSL	1L4’ T8/ELIG LOW POWER	26
1F32SSM	1L4' T8/EEMAG	37
1F32SSH	1L4’ T8/ELIG HIGH LMN	36
2F32SSE	2L4' T8/ELIG	60
2F32SSH	2L4' T8/ELIG HIGH LMN	78
2F32SSL	2L4’ T8/ELIG LOW PWR	52
2F32SSM	2L4' T8/EEMAG	70
3F32SSE	3L4' T8/ELIG	88
3F32SSH	3L4' T8/ELIG HIGH LMN	112
3F32SSL	3L4’ T8/ELIG LOW POWER	76
3F32SSM	3L4' T8/EEMAG	107
4F32SSE	4L4' T8/ELIG	112
4F32SSH	4L4' T8/ELIG HIGH LMN	156
4F32SSL	4L4’ T8/ELIG LOW PWR	98
4F32SSM	4L4' T8/EEMAG	140
5F32SSE	5L4' T8/ELIG	148
5F32SSH	5L4' T8/ELIG HIGH LMN	190
6F32SSE	6L4' T8/ELIG	174
8F32SSH	8L4' T8/ELIG HIGH LMN	312
Five Foot T8 / T12 Systems		
1F60HSM	1L5' HO/STD/EEMAG	90
1F60HSE	1L5' HO/STD/ELIG	70
1F60SSM	1L5’/STD/EEMAG	73

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Device Code	Device Description	Rated Watts
1F60TSM	1L5’ T10HO/STD/EEMAG	135
2F40HSE	2L5' HO/STD/ELIG	123
2F40TSE	2L5'T8/ELIG	68
2F60HSM	2L5' HO/STD/EEMAG	178
2F60SSM	2L5’/STD/EEMAG	122
3F40TSE	3L5'T8/ELIG	106
Six Foot T12 & T12HO Systems		
1F72HSE	1L6’ T8HO/ELIG	80
1F72HSS	1L6' F72HO/STD/STD	113
1F72SSM	1L6' STD/EEMAG	80
1F72SSS	1L6' STD/STD	95
2F72HSE	2L6'T8 HO/ELIG	160
2F72HSM	2L6' F72HO/STD/EEMAG	193
2F72HSS	2L6' F72HO/STD	195
2F72SSM	2L6' STD/EEMAG	135
2F72SSS	2L6' STD/STD	173
Eight Foot T12HO Systems		
1F96HES	1L8' HO/EE/STD	125
1F96HSS	1L8' HO/STD/STD	135
2F96HEE	2L8' HO/EE/ELIG	170
2F96HEM	2L8' HO/EE/EEMAG	207
2F96HES	2L8' HO/EE/STD	227
2F96HSE	2L8' HO/STD/ELIG	195
2F96HSM	2L8' HO/STD/EEMAG	237
2F96HSS	2L8' HO/STD/STD	257
3F96HES	3L8' HO/EE/STD	352
3F96HSS	3L8' HO/STD/STD	392
4F96HEE	4L8' HO/EE/ELIG	340
4F96HEM	4L8' HO/EE/EEMAG	414
4F96HES	4L8' HO/EE/STD	454
4F96HSE	4L8' HO/STD/ELIG	390
4F96HSM	4L8' HO/STD/EEMAG	474
4F96HSS	4L8' HO/STD/STD	514
Eight Foot T12VHO Systems		
1F96VES	1L8' VHO/EE/STD	200
1F96VSS	1L8' VHO/STD/STD	230
2F96VES	2L8' VHO/EE/STD	390
2F96VSS	2L8' VHO/STD/STD	450
3F96VES	3L8' VHO/EE/STD	590
3F96VSS	3L8' VHO/STD/STD	680
4F96VES	4L8' VHO/EE/STD	780
4F96VSS	4L8' VHO/STD/STD	900
Eight Foot T8 Systems		
1F59SSE	1L8' T8/ELIG	60
1F80SSE	1L8' T8 HO/ELIG	85
2F59SSE	2L8' T8/ELIG	109
2F59SSL	2L8' T8/ELIG LOW PWR	100

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Device Code	Device Description	Rated Watts
2F80SSE	2L8' T8 HO/ELIG	160
Eight Foot T12 Systems		
1F96SEE	1L8' EE/ELIG	60
1F96SES	1L8' EE/STD	83
1F96SSE	1L8' STD/ELIG	70
1F96SSS	1L8' STD/STD	100
2F96SEE	2L8' EE/ELIG	109
2F96SEM	2L8' EE/EEMAG	123
2F96SES	2L8' EE/STD	138
2F96SSE	2L8' STD/ELIG	134
2F96SSM	2L8' STD/EEMAG	158
2F96SSS	2L8' STD/STD	173
3F96SES	3L8' EE/STD	221
3F96SSS	3L8' STD/STD	273
4F96SEE	4L8' EE/ELIG	218
4F96SEM	4L8' EE/EEMAG	246
4F96SES	4L8' EE/STD	276
4F96SSE	4L8' STD/ELIG	268
4F96SSM	4L8' STD/EEMAG	316
4F96SSS	4L8' STD/STD	346

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Table 5: Retrofit Proposed Lighting Wattage Tables

Device Code	Device Description	Rated Watts
LED Exit Signs		
1E0002	2.0 WATT LED	2
1E0003	3.0 WATT LED	3
1E0005	5.0 WLED	5
1E0005C	0.5 WATT LEC	0.5
1E0008	8.0 WLED	8
1E0015	1.5 WATT LED	1.5
1E0105	10.5 WATT LED	10.5
Compact Fluorescents (CFL's)		
2C0007S	2/7W COMPACT HW	18
1C0005S	5W COMPACT HW	7
1C0007S	7W COMPACT HW	9
1C0009S	9W COMPACT HW	11
1C0011S	11W COMPACT HW	13
1C0013S	13W COMPACT HW	15
1C0018E	18W COMPACT HW ELIG	20
1C0018S	18W COMPACT HW	20
1C0022S	22W COMPACT HW	24
1C0023E	1/23W COMPACT HW ELIG	25
1C0026E	26W COMPACT HW ELIG	28
1C0026S	26W COMPACT HW	28
1C0028S	28W COMPACT HW	30
1C0032E	32W COMPACT HW ELIG	34
1C0032S	32W CIRCLINE HW	34
1C0042E	1/42W COMPACT HW ELIG	48
1C0044S	44W CIRCLINE HW	46
1C0057E	1/57W COMPACT HW ELIG	65
1C2232S	22/32W CIRCLINE HW	58
1C2D10E	10W 2D COMPACT HW ELIG	12
1C2D16E	16W 2D COMPACT HW ELIG	18
1C2D21E	21W 2D COMPACT HW ELIG	22
1C2D28E	28W 2D COMPACT HW ELIG	28
1C2D38E	38W 2D COMP.HW ELIG	36
1C3240S	32/40W CIRCLINE HW	80
2C0005S	2/5W COMPACT HW	14

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Device Code	Device Description	Rated Watts
2C0009S	2/9W COMPACT HW	22
2C0011S	2/11W COMPACT HW	26
2C0013E	2/13W COMPACT HW ELIG	28
2C0013S	2/13W COMPACT HW	30
Compact Fluorescents (CFL's) (cont.)		
2C0018E	2/18W COMP. HW ELIG	40
2C0026E	2/26W COMP. HW ELIG	54
2C0032E	2/32W COMPACT HW ELIG	68
2C0042E	2/42W COMPACT HW ELIG	100
3C0009S	3/9W COMPACT HW	33
3C0013S	3/13W COMPACT HW	45
3C0018E	3/18W COMPACT HW ELIG	60
3C0026E	3/26W COMPACT HW ELIG	82
3C0032E	3/32W COMPACT HW ELIG	114
3C0042E	3/42W COMPACT HW ELIG	141
4C0018E	4/18W COMPACT HW ELIG	80
4C0026E	4/26W COMPACT HW ELIG	108
4C0032E	4/32W COMPACT HW ELIG	152
4C0042E	4/42W COMPACT HW ELIG	188
6C0026E	6/26W COMPACT HW ELIG	162
6C0032E	6/32W COMPACT HW ELIG	228
6C0042E	6/42W COMPACT HW ELIG	282
8C0026E	8/26W COMPACT HW ELIG	216
8C0032E	8/32W COMPACT HW ELIG	304
8C0042E	8/42W COMPACT HW ELIG	376
T5 Systems		
1F14SSE	1L2' 14W T5/ELIG	16
2F14SSE	2L2' 14W T5/ELIG	32
3F14SSE	3L2' 14W T5/ELIG	50
4F14SSE	4L2' 14W T5/ELIG	68
1F24HSE	1L2' 24W T5HO/ELIG	29
2F24HSE	2L2' 24W T5HO/ELIG	52
3F24HSE	3L2' 24W T5HO/ELIG	80
1F21SSE	1L3' 21W T5/ELIG	24
2F21SSE	2L3' 21W T5/ELIG	47
1F39HSE	1L3' 39W T5HO/ELIG	42
2F39HSE	2L3' 39W T5HO/ELIG	85

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Device Code	Device Description	Rated Watts
1F28SSE	1L4' 28W T5/ELIG	32
2F28SSE	2L4' 28W T5/ELIG	63
3F28SSE	3L4' 28W T5/ELIG	95
4F28SSE	4L4' 28W T5/ELIG	126
6F28SSE	6L4' 28W T5/ELIG	189
1F47HSE	1L4' 47W T5HO/ELIG	53
2F47HSE	2L4' 47W T5HO/ELIG	103
3F47HSE	3L4' 47W T5HO/ELIG	157
T5 Systems (cont.)		
4F47HSE	4L4' 47W T5HO/ELIG	200
5F47HSE	5L4' 47W T5HO/ELIG	260
6F47HSE	6L4' 47W T5HO/ELIG	303
1F50HSE	1L4' 50W T5HO/ELIG	58
2F50HSE	2L4' 50W T5HO/ELIG	110
3F50HSE	3L4' 50W T5HO/ELIG	168
4F50HSE	4L4' 50W T5HO/ELIG	215
5F50HSE	5L4' 50W T5HO/ELIG	278
6F50HSE	6L4' 50W T5HO/ELIG	325
1F54HSE	1L4' 54W T5HO/ELIG	59
2F54HSE	2L4' 54W T5HO/ELIG	117
3F54HSE	3L4' 54W T5HO/ELIG	177
4F54HSE	4L4’ 54W T5HO/ELIG	234
5F54HSE	5L4' 54W T5HO/ELIG	294
6F54HSE	6L4’ 54W T5HO/ELIG	351
8F54HSE	8L4' 54W T5HO/ELIG	468
10F54HSE	10L4’ 54W T5HO/ELIG	585
Two Foot High Efficient T8 Systems		
1F17ESL	1L2' 17W T8EE/ELEE LOW PWR	14
1F17ESN	1L2' 17W T8EE/ELEE	17
1F17ESH	1L2' 17W T8EE/ELEE HIGH PWR	20
1F28BXE	1L2' F28BX/ELIG	32
2F17ESL	2L2' 17W T8EE/ELEE LOW PWR	27
2F17ESN	2L2' 17W T8EE/ELEE	32
2F17ESH	2L2' 17W T8EE/ELEE HIGH PWR	40
2F28BXE	2L2' F28BX/ELIG	63
3F17ESL	3L2' 17W T8EE/ELEE LOW PWR	39
3F17ESN	3L2' 17W T8EE/ELEE	46

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Device Code	Device Description	Rated Watts
3F17ESH	3L2' 17W T8EE/ELEE HIGH PWR	61
3F28BXE	3L2' F28BX/ELIG	94
Three Foot High Efficient T8 Systems		
1F25ESL	1L3' 25W T8EE/ELEE LOW PWR	21
1F25ESN	1L3' 25W T8EE/ELEE	24
1F25ESH	1L3' 25W T8EE/ELEE HIGH PWR	30
2F25ESL	2L3' 25W T8EE/ELEE LOW PWR	40
2F25ESN	2L3' 25W T8EE/ELEE	45
2F25ESH	2L3' 25W T8EE/ELEE HIGH PWR	60
3F25ESL	3L3' 25W T8EE/ELEE LOW PWR	58
3F25ESN	3L3' 25W T8EE/ELEE	67
3F25ESH	3L3' 25W T8EE/ELEE HIGH PWR	90
Four Foot T8 High Efficient / Reduce Wattage Systems		
1F25EEH	1L4' 25W T8EE/ELEE HIGH PWR	30
1F25EEE	1L4' 25W T8EE/ELEE	22
1F25EEL	1L4' 25W T8EE/ELEE LOW PWR	19
2F25EEH	2L4' 25W T8EE/ELEE HIGH PWR	57
2F25EEE	2L4' 25W T8EE/ELEE	43
2F25EEL	2L4' 25W T8EE/ELEE LOW PWR	37
3F25EEH	3L4' 25W T8EE/ELEE HIGH PWR	86
3F25EEE	3L4' 25W T8EE/ELEE	64
3F25EEL	3L4' 25W T8EE/ELEE LOW PWR	57
4F25EEH	4L4' 25W T8EE/ELEE HIGH PWR	111
4F25EEE	4L4' 25W T8EE/ELEE	86
4F25EEL	4L4' 25W T8EE/ELEE LOW PWR	75
1F28EEH	1L4' 28W T8EE/ELEE HIGH PWR	33
1F28EEE	1L4' 28W T8EE/ELEE	24
1F28EEL	1L4' 28W T8EE/ELEE LOW PWR	22
2F28EEH	2L4' 28WT8EE/ELEE HIGH PWR	64
2F28EEE	2L4' 28W T8EE/ELEE	48
2F28EEL	2L4' 28W T8EE/ELEE LOW PWR	42
3F28EEH	3L4' 28W T8EE/ELEE HIGH PWR	96
3F28EEE	3L4' 28W T8EE/ELEE	72
3F28EEL	3L4' 28W T8EE/ELEE LOW PWR	63
4F28EEH	4L4' 28W T8EE/ELEE HIGH PWR	126
4F28EEE	4L4' 28W T8EE/ELEE	94
4F28EEL	4L4' 28W T8EE/ELEE LOW PWR	83
1F30EEH	1L4' 30W T8EE/ELEE HIGH PWR	36

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Device Code	Device Description	Rated Watts
1F30EEE	1L4' 30W T8EE/ELEE	26
1F30EEL	1L4' 30W T8EE/ELEE LOW PWR	24
2F30EEH	2L4' 30WT8EE/ELEE HIGH PWR	69
2F30EEE	2L4' 30W T8EE/ELEE	52
2F30EEL	2L4' 30W T8EE/ELEE LOW PWR	45
3F30EEH	3L4' 30W T8EE/ELEE HIGH PWR	103
3F30EEE	3L4' 30W T8EE/ELEE	77
3F30EEL	3L4' 30W T8EE/ELEE LOW PWR	68
4F30EEH	4L4' 30W T8EE/ELEE HIGH PWR	133
4F30EEE	4L4' 30W T8EE/ELEE	101
4F30EEL	4L4' 30W T8EE/ELEE LOW PWR	89
1F32EEH	1L4' 32W T8EE/ELEE HIGH PWR	38
1F32EEE	1L4' 32W T8EE/ELEE	28
1F32EEL	1L4' 32W T8EE/ELEE LOW PWR	25
2F32EEH	2L4' 32W T8EE/ELEE HIGH PWR	73
2F32EEE	2L4' 32W T8EE/ELEE	53
Four Foot T8 High Efficient / Reduce Wattage Systems (cont.)		
2F32EEL	2L4' 32W T8EE/ELEE LOW PWR	47
3F32EEH	3L4' 32W T8EE/ELEE HIGH PWR	109
3F32EEE	3L4' 32W T8EE/ELEE	82
3F32EEL	3L4' 32W T8EE/ELEE LOW PWR	72
4F32EEH	4L4' 32W T8EE/ELEE HIGH PWR	141
4F32EEE	4L4' 32W T8EE/ELEE	107
4F32EEL	4L4' 32W T8EE/ELEE LOW PWR	95
6F32EEH	6L4' 32W T8EE/ELEE HIGH PWR	218
6F32EEE	6L4' 32W T8EE/ELEE	168
6F32EEL	6L4' 32W T8EE/ELEE LOW PWR	146
Eight Foot T8 Systems		
1F59SSE	1L8' T8/ELIG	60
1F80SSE	1L8' T8 HO/ELIG	85
2F59SSE	2L8' T8/ELIG	109
2F59SSL	2L8' T8/ELIG LOW PWR	100
2F80SSE	2L8' T8 HO/ELIG	160
LED Lighting Fixtures		
1L002	2 WATT LED	2
1L003	3 WATT LED	3

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Device Code	Device Description	Rated Watts
1L004	4 WATT LED	4
1L005	5 WATT LED	5
1L006	6 WATT LED	6
1L007	7 WATT LED	7
1L008	8 WATT LED	8
1L009	9 WATT LED	9
1L010	10 WATT LED	10
1L011	11 WATT LED	11
1L012	12 WATT LED	12
1L013	13 WATT LED	13
1L014	14 WATT LED	14
1L015	15 WATT LED	15
1L016	16 WATT LED	16
1L017	17 WATT LED	17
1L018	18 WATT LED	18
1L019	19 WATT LED	19
1L020	20 WATT LED	20
1L021	21 WATT LED	21
1L022	22 WATT LED	22
1L023	23 WATT LED	23
LED Lighting Fixtures (cont.)		
1L024	24 WATT LED	24
1L025	25 WATT LED	25
1L026	26 WATT LED	26
1L027	27 WATT LED	27
1L028	28 WATT LED	28
1L029	29 WATT LED	29
1L030	30 WATT LED	30
1L031	31 WATT LED	31
1L032	32 WATT LED	32
1L033	33 WATT LED	33
1L034	34 WATT LED	34
1L035	35 WATT LED	35
1L036	36 WATT LED	36
1L037	37 WATT LED	37
1L038	38 WATT LED	38
1L039	39 WATT LED	39
1L040	40 WATT LED	40

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Device Code	Device Description	Rated Watts
1L041	41 WATT LED	41
1L042	42 WATT LED	42
1L043	43 WATT LED	43
1L044	44 WATT LED	44
1L045	45 WATT LED	45
1L046	46 WATT LED	46
1L047	47 WATT LED	47
1L048	48 WATT LED	48
1L049	49 WATT LED	49
1L050	50 WATT LED	50
1L055	55 WATT LED	55
1L060	60 WATT LED	60
1L070	70 WATT LED	70
1L073	73 WATT LED	73
1L075	75 WATT LED	75
1L080	90 WATT LED	90
1L085	85 WATT LED	85
1L090	90 WATT LED	90
1L095	95 WATT LED	95
1L100	100 WATT LED	100
1L106	106 WATT LED	106
1L107	107 WATT LED	107
1L116	116 WATT LED	116
1L120	120 WATT LED	120
LED Lighting Fixtures (cont.)		
1L125	125 WATT LED	125
1L130	130 WATT LED	130
1L135	135 WATT LED	135
1L140	140 WATT LED	140
1L145	145 WATT LED	145
1L150	150 WATT LED	150
1L155	155 WATT LED	155
1L160	160 WATT LED	160
1L165	165 WATT LED	165
1L170	170 WATT LED	170
1L175	175 WATT LED	175
1L180	180 WATT LED	180
1L185	185 WATT LED	185

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1L190	190 WATT LED	190
1L200	200 WATT LED	200
1L210	210 WATT LED	210
1L220	220 WATT LED	220
1L240	240 WATT LED	240
Electronic Metal Halide Lamps		
1M0150E	150W METAL HALIDE EB	160
1M0200E	200W METAL HALIDE EB	215
1M0250E	250W METAL HALIDE EB	270
1M0320E	320W METAL HALIDE EB	345
1M0350E	350W METAL HALIDE EB	375
1M0400E	400W METAL HALIDE EB	430
1M0450E	400W METAL HALIDE EB	480
MH Track Lighting		
1M0020E	20W MH SPOT	25
1M0025E	25W MH SPOT	25
1M0035E	35W MH SPOT	44
1M0039E	39W MH SPOT	47
1M0050E	50W MH SPOT	60
1M0070E	70W MH SPOT	80
1M0100E	100W MH SPOT	111
1M0150E	150W MH SPOT	162

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Table 6: Upstream Lighting Savings and Measure Lives

Product type	Annual Savings, kWh	Watts saved	Measure Life	RI Annual HOU
T8	13.0	3.5	10	3,684
T5HO	14.7	4.0	10	3,684
T8 - 28	13.0	3.5	10	3,684
T8 - 25	22.7	6.2	10	3,684
U-Bend T8 - 28	13.0	3.5	7	3,684
U-Bend T8 - 25	22.7	6.2	7	3,684
PAR20	115.3	29.8	11	3,870
PAR30	156.3	40.4	11	3,870
PAR38	181.1	46.8	11	3,870
MR16	90.6	23.4	11	3,870
A-line, 40/60w	129.8	**33.5**	**6**	3,870
A-line, 75/100w	182.3	47.1	6	3,870
Decoratives	81.5	21.1	5	3,870
TLED, 4ft	31.4	**8.5**	**12**	3,684
TLED, 2ft	15.7	**4.3**	**12**	3,684
G24 LED	50.1	12.8	13	3,870
LED Retrofit kit, <25W	157.4	40.7	11	3,870
LED Retrofit kit, >25W	232.0	60.0	12	3,870
Stairwell Kit, 2ft w/sensor	467.8	53.4	7	8,760
Stairwell Kit, 4ft w/sensor	403.0	46.0	7	8,760

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Table 7: Baseline Efficiency Requirements for C&I Unitary Air Conditioners[c]

Equipment Type	Size Category	Subcategory or Rating Condition	Baseline Efficiency After 1/2014
Air conditioners, air cooled	<65,000 Btu/h[b]	Split system	13.0 SEER
		Single package	13.0 SEER
	≥65,000 Btu/h and <135,000 Btu/h	Split system and single package	11.2 EER[a] 11.4 IEER[a]
	≥135,000 Btu/h and <240,000 Btu/h	Split system and single package	11.0 EER[a] 11.2 IEER[a]
	≥240,000 Btu/h and <760,000 Btu/h	Split system and single package	10.0 EER[a] 10.1 IEER[a]
	≥760,000 Btu/h	Split system and single package	9.7 EER[a] 9.8 IEER[a]
Air conditioners, Water cooled	<65,000 Btu/h	Split system and single package	12.1 EER 12.3 IEER
	≥65,000 Btu/h and <135,000 Btu/h	Split system and single package	12.1 EER[a] 12.3 IEER[a]
	≥135,000 Btu/h and <240,000 Btu/h	Split system and single package	12.5 EER[a] 12.7 IEER[a]
	≥240,000 Btu/h	Split system and single package	12.4 EER[a] 12.6 IEER[a]
Air conditioners, evaporatively cooled	<65,000 Btu/h	Split system and single package	12.1 EER 12.3 IEER
	≥65,000 Btu/h and <135,000 Btu/h	Split system and single package	12.1 EER[a] 12.3 IEER[a]
	≥135,000 Btu/h and <240,000 Btu/h	Split system and single package	12.0 EER[a] 12.2 IEER[a]
	≥240,000 Btu/h	Split system and single package	11.9 EER[a] 12.1 IEER[a]

a. Deduct 0.2 from the required EERs for units with a heating section other than electric heat.[1]

b. Single-phase air-cooled air conditioners <65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA); SEER values are those set by NAECA.

c. Baseline determined by International Code Council (2012). *2012 International Energy Conservation Code;* Page C-38, Table C403.2.3(1)

Baseline determined by International Code Council (2012). 2012 International Energy Conservation Code; Page C-38, Table C403.2.3(1)

The Program does not differentiate units by heating section types, therefore the highest baseline efficiency is assumed for all heating section types in each equipment category

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Table 8: Baseline Efficiency Requirements for C&I Heat Pumps

Equipment Type	Size Category (Cooling Capacity)	Subcategory or Rating Condition	Baseline Efficiency After 1/1/2014[i]	
			Cooling Mode	Heating Mode
Air cooled	<65,000 Btu/h[b]	Split system	13.0 SEER	7.7 HSPF
		Single package	13.0 SEER	7.7 HSPF
	≥65,000 Btu/h and <135,000 Btu/h	Split system and single package / 47°F db/43°F wb outdoor air	11.0 EER[a] 11.2 IEER[a]	3.3 COP
	≥135,000 Btu/h and <240,000 Btu/h	Split system and single package / 47°F db/43°F wb outdoor air	10.6 EER[a] 10.7 IEER[a]	3.2 COP
	≥240,000 Btu/h	Split system and single package / 47°F db/43°F wb outdoor air	9.5 EER[a] 9.6 IEER[a]	3.2 COP
Water source	<17,000 Btu/h	86°F entering water (Cooling Mode) / 68°F entering water (Heating Mode)	11.2 EER	4.2 COP
	≥17,000 Btu/h and <135,000 Btu/h	86°F entering water / 68°F entering water (Heating Mode)	12.0 EER	4.2 COP
Groundwater source	<135,000 Btu/h	59°F entering water (Cooling Mode) / 50°F entering water (Heating Mode)	16.2 EER	3.6 COP
Ground source	<135,000 Btu/h	77°F entering water / 32°F entering water (Heating Mode)	13.4 EER	3.1 COP

db = dry-bulb temperature, °F; wb = wet-bulb temperature, °F.

a. Deduct 0.2 from the required EERs for units with a heating section other than electric heat[1].

b. Single-phase air-cooled air conditioners <65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA); SEER values are those set by NAECA.

[i] International Code Council (2012). 2012 International Energy Conservation Code. Page C-40, Table C403.2.3(2)

The Program does not differentiate units by heating section types, therefore the highest baseline efficiency is assumed for all heating section types in each equipment category

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Table 9: Water Chilling Packages - Minimum Efficiency Requirements

Equipment Type	Size Category (Tons)	Units	Path A		Path B	
			Full Load	IPLV	Full Load	IPLV
Air-cooled chillers	< 150	EER	9.562	12.5	NA	NA
	≥ 150	EER	9.562	12.75	NA	NA
Water cooled, electrically operated, positive displacement (rotary screw and scroll)	< 75	kW/ton	0.78	0.63	0.8	0.6
	≥ 75 and < 150	kW/ton	0.775	0.615	0.79	0.586
	≥ 150 and < 300	kW/ton	0.68	0.58	0.718	0.54
	≥ 300	kW/ton	0.62	0.54	0.639	0.49
Water cooled, electrically operated, centrifugal	< 150	kW/ton	0.634	0.596	0.639	0.45
	≥ 150 and < 300	kW/ton	0.634	0.596	0.639	0.45
	≥ 300 and < 600	kW/ton	0.576	0.549	0.6	0.4
	≥ 600	kW/ton	0.57	0.539	0.59	0.4

Note: Compliance with this standard may be obtained by meeting the minimum requirements of Path A or B, however, both the Full Load and IPLV must be met to fulfill the requirements of Path A or B.

Table 10: Chiller Load Factors

Equipment Type	Full Load	IPLV
Air-cooled chillers	0.715	0.715
Water cooled chillers <300 Tons	0.882	0.823
Water cooled chillers >300 Tons	0.762	0.765

National Grid load factors based on a 1994 study.

Table 11: Cooling and Heating Equivalent Full Load Hours

Building (or Space) Type	Cooling Full Load Hours ($EFLH_{cool}$)	Heating Full Load Hours ($EFLH_{heat}$)
National Grid RI (NE – South Coastal)	817	1137

Average Cooling EFLHs from the 2010 NEEP HVAC Loadshape study.[1]
Average Heating EFLHs derived from 2010 NEEP HVAC Loadshape study[2] and the Connecticut Program Savings Document for 2011 Program Year. [3]

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[1] KEMA (2011). C&I Unitary AC LoadShape Project – Final Report. Prepared for the Regional Evaluation, Measurement & Verification Forum.

[2] Ibid.

[3] United Illuminating Company, Connecticut Light & Power Company (2010). UI and CL&P Program Savings Documentation for 2011 Program Year.

Table 12: Savings Factors for ECM HVAC Fan Motors

Factor	Box Size	Value	Units
Box Size Factor	< 1000 CFM	0.32	Watts/CFM
Box Size Factor	≥ 1000 CFM	0.21	Watts/CFM
$\%Flow_{ANNUAL}$	ALL	0.52	-
$\%Flow_{SP}$	ALL	0.63	-
$\%Flow_{WP}$	ALL	0.33	-

Factors based on engineering analyses developed at National Grid

Table 13: Savings Factors for Cooler Night Covers

Cooler Case Temperature	**Savings Factor (ΔkW/foot)**
Low Temperature (-35 F to -5 F)	0.03
Medium Temperature (0 F to 30 F)	0.02
High Temperature (35 F to 55F)	0.01

CL&P Program Savings Documentation for 2011 Program Year (2010). Factors based on Southern California Edison (1997). *Effects of the Low Emissive Shields on Performance and Power Use of a Refrigerated Display Case.*

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Table 14: Savings Factors for C&I VSDs (kWh/HP and kW/HP)

	Building Exhaust Fan	Cooling Tower Fan	Chilled Water Pump	Boiler Feed Water Pump	Hot Water Circulating. Pump	MAF - Make-up Air Fan	Return Fan	Supply Fan	WS Heat Pump Circulating Loop
Annual Energy Savings Factors (kWh/HP)									
University/College	3,641	449	745	2,316	2,344	3,220	1,067	1,023	3,061
Elm/H School	3,563	365	628	1,933	1,957	3,402	879	840	2,561
Multi-Family	3,202	889	1,374	2,340	2,400	3,082	1,374	1,319	3,713
Hotel/Motel	3,151	809	1,239	2,195	2,239	3,368	1,334	1,290	3,433
Health	3,375	1,705	2,427	2,349	2,406	3,002	1,577	1,487	3,670
Warehouse	3,310	455	816	2,002	2,087	3,229	1,253	1,205	2,818
Restaurant	3,440	993	1,566	1,977	2,047	2,628	1,425	1,363	3,542
Retail	3,092	633	1,049	1,949	2,000	2,392	1,206	1,146	2,998
Grocery	3,126	918	1,632	1,653	1,681	2,230	1,408	1,297	3,285
Offices	3,332	950	1,370	1,866	1,896	3,346	1,135	1,076	3,235
Summer Demand Savings Factors (kW/HP_{SP})									
University/College	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Elm/H School	0.377	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.275
Multi-Family	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Hotel/Motel	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Health	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Warehouse	0.109	-0.023	0.056	0.457	0.457	0.261	0.102	0.064	0.056
Restaurant	0.261	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.178
Retail	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Grocery	0.261	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.178
Offices	0.109	-0.023	0.056	0.457	0.457	0.109	0.102	0.064	0.056
Winter Demand Savings Factors (kW/HP_{WP})									
University/College	0.377	-0.006	0.457	0.457	0.457	0.109	0.113	0.113	0.457
Elementary/High School	0.457	-0.006	0.457	0.457	0.457	0.109	0.113	0.113	0.457
Multi-Family	0.109	-0.006	0.457	0.355	0.384	0.109	0.113	0.113	0.355
Hotel/Motel	0.109	-0.006	0.457	0.418	0.444	0.109	0.113	0.113	0.418
Health	0.377	-0.006	0.457	0.275	0.298	0.109	0.113	0.113	0.275
Warehouse	0.377	-0.006	0.457	0.178	0.193	0.261	0.113	0.113	0.178
Restaurant	0.109	-0.006	0.457	0.355	0.384	0.109	0.113	0.113	0.355
Retail	0.109	-0.006	0.457	0.275	0.298	0.109	0.113	0.113	0.275
Grocery	0.457	-0.006	0.457	0.418	0.444	0.109	0.113	0.113	0.418
Offices	0.457	-0.006	0.457	0.418	0.444	0.109	0.113	0.113	0.418

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Table 15: Baseline Efficiency Requirements for Gas and Electric Commercial Ovens

Equipment Type	Baseline Efficiency	Efficiency Requirement
Gas-Fired Convection Oven	30%	>=44%
Gas-Fired Combination Oven	35%	>=44%
Gas-Fired Conveyor Oven	20% Heavy Load	>=44%
Gas-Fired Rack Oven	30%	>=50%
Commercial Electric Oven	Convection Cooking: 65% at 80lb/hr, 3.0 kW idle mode, 3.0 kW preheat Steam Cooking: 40% at 100lb/hr, 10.0 kW idle mode, 3.0kW preheat	

Table 16: HVAC Interactive Effects for C&I Lighting

Program	Lighting Type	Gas Impact (MMBtu/ΔkWh)[i]	Oil Impact (MMBtu/ΔkWh)[ii]
C&I New Construction	Lighting Systems	-0.00043	-0.00083
	Lighting Controls	-0.00028	-0.00055
	Upstream Lighting - LEDs	-0.0003	-0.0006
	Upstream Lighting - Fluorescents	-0.00039	-0.00077
C&I Retrofit	Lighting Systems	-0.00043	-0.00083
	Lighting Controls	-0.00028	-0.00055

[i] C&I Lighting Interactive Effects 2015
[ii] C&I Lighting Interactive Effects 2015

Table 17: Default kW Reduction per CFM by CAIR Dryer Capacity

Dryer Capacity ($CFM_{DRYE}R$)	kW Reduction per CFM [1]
<100	0.00474
≥100 and <200	0.00359
≥200 <300	0.00316
≥300 <400	0.0029
≥400	0.00272

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Table 18: CAIR Compressor kW Reduction per Horsepower

Control Type	Nominal Horsepower (HP)	kW Reduction per Horsepower [1]	
		New Construction	Retrofit
Load/No Load	≥15 and <25	0.076	0.102
Load/No Load	≥25 and <75	0.114	0.102
VSD	≥15 and <25	0.159	0.207
VSD	≥25 and <75	0.228	0.206
Variable Displacement	≥50 and <75	0.11	0.116

Table 19: Baseline Efficiency Requirements for C&I Gas-Fired Boilers

Equipment Type	Subcategory	Size Category (Input)	Minimum Efficiency[a]	Test Procedure
Boilers, hot water	Gas-fired	<300,000 Btu/h	80% AFUE	10 CFR Part 430
		>=300,000 Btu/h and <=2,500,000 Btu/h[b]	80% E_t	10 CFR Part 431
		>2,500,000 Btu/h[c]	82% E_c	10 CFR Part 430

a. Annual Fuel Utilization Efficiency (AFUE), Thermal efficiency (Et), Combustion efficiency (Ec)

b. Maximum capacity – min. and max. ratings as provided for and allowed by the units controls

c. These requirements apply to boilers with rated input of 8 MMBtu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers

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Appendix C: Acronyms

ACRONYM	DESCRIPTION
AC	Air Conditioning
AFUE	Annual Fuel Utilization Efficiency (see the Glossary)
AHU	Air Handling Unit
Btu	British Thermal Unit (see the Glossary)
CF	Coincidence Factor (see the Glossary)
CFL	Compact Fluorescent Lamp
CHP	Combined Heat and Power
COP	Coefficient of Performance (see the Glossary)
DCV	Demand Controlled Ventillation
DHW	Domestic Hot Water
DOER	Department of Energy Resources
DSM	Demand Side Management (see the Glossary)
ECM	Electrically Commutated Motor
EER	Energy Efficiency Ratio (see the Glossary)
EF	Efficiency Factor
EFLH	Equivalent Full Load Hours (see the Glossary)
ES	ENERGY STAR® (see the Glossary)
FCM	Forward Capacity Market
FR	Free-Ridership (see the Glossary)
HE	High-Efficiency
HID	High-Intensity Discharge (a lighting technology)
HP	Horse Power (see the Glossary)
HSPF	Heating Seasonal Performance Factor (see the Glossary)
HVAC	Heating, Ventilating, and Air Conditioning
ISO	Independent System Operator
ISR	In-Service Rate (see the Glossary)
kW	Kilo-Watt, a unit of electric demand equal to 1,000 watts
kWh	Kilowatt-Hour, a unit of energy (1 kilowatt of power supplied for one hour)
LED	Light-Emitting Diode (one type of solid-state lighting)
LCD	Liquid Crystal Display (a technology used for computer monitors and similar displays)
MMBtu	One million British Thermal Units (see “Btu” in the Glossary)
MW	Megawatt – a measure of electric demand equal to 1,000 kilowatts
MWh	Megawatt-hour – a measure of energy equal to 1,000 kilowatt-hours
NEB	Non-Electric Benefit (see the Glossary)
NEI	Non-Energy Impact
NE-ISO	New England Independent System Operator
NTG	Net-to-Gross (see the Glossary)
O&M	Operations and Maintenance
PA	Program Administrator (see the Glossary)
PC	Personal Computer
RR	Realization Rate (see the Glossary)
SEER	Seasonal Energy Efficiency Ratio (see the Glossary)
SO	Spillover (see the Glossary)
SPF	Savings Persistence Factor (see the Glossary)
SSL	Solid-State Lighting (e.g., LED lighting)
VSD	Variable-Speed Drive

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Appendix D: Glossary

This glossary provides definitions as they are applied in this TRM for Rhode Island' energy efficiency programs. Alternate definitions may be used for some terms in other contexts.

TERM	DESCRIPTION
Adjusted Gross Savings	Gross savings (as calculated by the measure savings algorithms) that have been subsequently adjusted by the application of all impact factors except the net-to-gross factors (free-ridership and spillover).
AFUE	Annual Fuel Utilization Efficiency. The measure of seasonal or annual efficiency of a furnace or boiler. AFUE takes into account the cyclic on/off operation and associated energy losses of the heating unit as it responds to changes in the load, which in turn is affected by changes in weather and occupant controls.
Baseline Efficiency	The level of efficiency of the equipment that would have been installed without any influence from the program or, for retrofit cases where site-specific information is available, the actual efficiency of the existing equipment.
Btu	British thermal unit. A Btu is approximately the amount of energy needed to heat one pound of water by one degree Fahrenheit.
Coefficient of Performance (COP)	Coefficient of Performance is a measure of the efficiency of a heat pump, air conditioner, or refrigeration system. A COP value is given as the Btu output of a device divided by the Btu input of the device. The input and output are determined at AHRI testing standards conditions designed to reflect peak load operation.
Coincidence Factor (CF)	Coincidence Factors represent the fraction of connected load expected to occur concurrent to a particular system peak period; separate CF are found for summer and winter peaks. The CF given in the TRM includes both coincidence and diversity factors multiplied into one number. Coincidence factors are provided for peak periods defined by the NE-ISO for FCM purposes and calculated consistent with the FCM methodology.
Connected Load kW Savings	The connected load kW savings is the power saved by the equipment while in use. In some cases the savings reflect the maximum power draw of equipment at full load. In other cases the connected load may be variable, which must be accounted for in the savings algorithm.
Deemed Savings	Savings values (electric, fossil fuel and/or non-energy benefits) determined from savings algorithms with assumed values for all algorithm parameters. Alternatively, deemed savings values may be determined from evaluation studies. A measure with deemed savings will have the same savings per unit since all measure assumptions are the same. Deemed savings are used by program administrators to report savings for measures with well-defined performance characteristics relative to baseline efficiency cases. Deemed savings can simplify program planning and design, but may lead to over- or under-estimation of savings depending on product performance.
Deemed Calculated Savings	Savings values (electric, fossil fuel and/or non-energy benefits) that depend on a standard savings algorithm and for which at least one of the algorithm parameters (e.g., hours of operation) is project specific.
Demand Savings	The reduction in demand due to installation of an energy efficiency measure, usually expressed as kW and measured at the customer's meter (see Connected Load kW Savings).
Demand Side Management (DSM)	Strategies used to manage energy demand including energy efficiency, load management, fuel substitution, and load building.
Diversity	A characteristic of a variety of electric loads whereby individual maximum demands occur at different times. For example, 50 efficient light fixtures may be installed, but they are not necessarily all on at the same time. See Coincidence Factor.

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TERM	DESCRIPTION
Diversity Factor	This TRM uses coincidence factors that incorporate diversity (See Coincidence Factor), thus this TRM has no separate diversity factors. A diversity factor is typically calculated as: 1) the percent of maximum demand savings from energy efficiency measures available at the time of the company's peak demand, or 2) the ratio of the sum of the demands of a group of users to their coincident maximum demand.
End Use	Refers to the category of end use or service provided by a measure or technology (e.g., lighting, cooling, etc.). For the purpose of this manual, the list of end-uses include: Lighting, HVAC Refrigeration, Hot Water Food Service, Behavior Compressed Air, Motors & Drives Products, Custom
Energy Efficiency Ratio (EER)	The Energy Efficiency Ratio is a measure of the efficiency of a cooling system at a specified peak, design temperature, or outdoor temperature. In technical terms, EER is the steady-state rate of heat energy removal (i.e. cooling capacity) of a product measured in Btuh output divided by watts input.
ENERGY STAR® (ES)	Brand name for the voluntary energy efficiency labeling initiative sponsored by the U.S. Environmental Protection Agency.
Energy Costing Period	A period of relatively high or low system energy cost, by season. The energy periods defined by ISO-NE are: • **Summer Peak**: 6am–10pm, Monday–Friday (except ISO holidays), June–September • **Summer Off-Peak:** Summer hours not included in the summer peak hours: 10pm–6am, Monday–Friday, all day on Saturday and Sunday, and ISO holidays, June–September • **Winter Peak:** 6am–10pm, Monday–Friday (except ISO holidays), January–May and October–December • **Winter Off-Peak:** Winter hours not included in the sinter peak hours: 10pm–6am, Monday–Friday, all day on Saturday and Sunday, and ISO holidays, January–May and October–December.
Equivalent Full Load Hours (EFLH)	The equivalent hours that equipment would need to operate at its peak capacity in order to consume its estimated annual kWh consumption (annual kWh/connected kW).
Free Rider	A customer who participates in an energy efficiency program, but would have installed some or all of the same measure(s) on their own, with no change in timing of the installation, if the program had not been available.
Free-Ridership Rate	The percentage of savings attributable to participants who would have installed the measures in the absence of program intervention.
Gross kW	Expected demand reduction based on a comparison of standard or replaced equipment and equipment installed through an energy efficiency program.
Gross kWh	Expected kWh reduction based on a comparison of standard or replaced equipment and equipment installed through an energy efficiency program.
Gross Savings	A saving estimate calculated from objective technical factors. In this TRM, "gross savings" are calculated with the measure algorithms and do not include any application of impact factors. Once impact factors are applied, the savings are called "Adjusted Gross Savings".
High Efficiency (HE)	Refers to the efficiency measures that are installed and promoted by the energy efficiency programs.
Horsepower (HP)	A unit for measuring the rate of doing work. One horsepower equals about three-fourths of a kilowatt (745.7 watts).

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TERM	DESCRIPTION
Heating Seasonal Performance Factor (HSPF)	A measure of the seasonal heating mode efficiencies of heat pumps expressed as the ratio of the total heating output to the total seasonal input energy.
Impact Factor	Generic term for a value used to adjust the gross savings estimated by the savings algorithms in order to reflect the actual savings attributable to the efficiency program. In this TRM, impact factors include realization rates, in-service rates, savings persistence, peak demand coincidence factors, free-ridership, spillover and net-to-gross factors. See the section on Impact Factors for more detail.
In-Service Rate	The percentage of units that are actually installed. For example, efficient lamps may have an in-service rate less than 100% since some lamps are purchased as replacement units and are not immediately installed. The in-service rate for most measures is 100%.
Measure Life	The number of years that an efficiency measure is expected to garner savings. These are generally based on engineering lives, but sometimes adjusted based on observations of market conditions.
Lost Opportunity	Refers to a measure being installed at the time of planned investment in new equipment or systems. Often this reflects either new construction, renovation, remodeling, planned expansion or replacement, or replacement of failure.
Measure	A product (a piece of equipment), combination of products, or process designed to provide energy and/or demand savings. Measure can also refer to a service or a practice that provides savings. Measure can also refer to a specific combination of technology and market/customer/practice/strategy (e.g., direct install low income CFL).
Net Savings	The final value of savings that is attributable to a program or measure. Net savings differs from gross savings (or adjusted gross savings) because it includes adjustments due to free-ridership and/or spillover. Net savings is sometimes referred to as "verified" or "final" savings.
Net-to-Gross Ratio	The ratio of net savings to the adjusted gross savings (for a measure or program). The adjusted gross savings include any adjustment by the impact factors other than free-ridership or spillover. Net-to-gross is usually expressed as a percent.
Non-Electric Benefits (NEBs)	Quantifiable benefits (beyond electric savings) that are the result of the installation of a measure. Fossil fuel, water, and maintenance are examples of non-electric benefits. Non-electric benefits can be negative (i.e. increased maintenance or increased fossil fuel usage which results from a measure) and therefore are sometimes referred to as "non-electric impacts".
Non-Participant	A customer who is eligible to participate in a program, but does not. A non-participant may install a measure because of a program, but the installation of the measure is not through regular program channels; as a result, their actions are normally only detected through evaluations.
On-Peak kW	See Summer/Winter On-peak kW
Operating Hours	Hours that a piece of equipment is expected to be in operation, not necessarily at full load (typically expressed per year).
Participant	A customer who installs a measure through regular program channels and receives any benefit (i.e. incentive) that is available through the program because of their participation. Free-riders are a subset of this group.
Prescriptive Measure	A prescriptive measure is generally offered by use of a prescriptive form with a prescribed incentive based on the parameters of the efficient equipment or practice.
Realization Rate (RR)	The ratio of measure savings developed from impact evaluations to the estimated measure savings derived from the TRM savings algorithms. This factor is used to adjust the estimated savings when significant justification for such adjustment exists. The components of the realization rate are described in detail in the section on Impact Factors.

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TERM	DESCRIPTION
Retrofit	The replacement of a piece of equipment or device before the end of its useful or planned life for the purpose of achieving energy savings. "Retrofit" measures are sometimes referred to as "early retirement" when the removal of the old equipment is aggressively pursued.
Savings Persistence Factor (SPF)	Percentage of first-year energy or demand savings expected to persist over the life of the installed energy efficiency equipment. The SPF is developed by conducting surveys of installed equipment several years after installation to determine the operational capability of the equipment. In contrast, *measure persistence* takes into account business turnover, early retirement of installed equipment, and other reasons the installed equipment might be removed or discontinued. Measure persistence is generally incorporated as part of the measure life, and therefore is not included as a separate impact factor.
Seasonal Energy Efficiency Ratio (SEER)	A measurement of the efficiency of a central air conditioner over an entire season. In technical terms, SEER is a measure of equipment the total cooling of a central air conditioner or heat pump (in Btu) during the normal cooling season as compared to the total electric energy input (in watt-hours) consumed during the same period.
Sector	A system for grouping customers with similar characteristics. For the purpose of this manual, the sectors are Commercial and Industrial (C&I), Small Business, Residential, and Low Income.
Spillover Rate	The percentage of savings attributable to the program, but additional to the gross (tracked) savings of a program. Spillover includes the effects of (a) participants in the program who install additional energy efficient measures outside of the program as a result of hearing about the program and (b) non-participants who install or influence the installation of energy efficient measures as a result of being aware of the program.
Summer/Winter On-Peak kW	The average demand reduction during the summer/winter on-peak period. The summer on-peak period is 1pm-5pm on non-holiday weekdays in June, July and August; the winter on-peak period is 5pm-7pm on non-holiday weekdays in December and January.
Ton	Unit of measure for determining cooling capacity. One ton equals 12,000 Btu.
Watt	A unit of electrical power. Equal to 1/1000 of a kilowatt.

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