STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

In Re: The Narragansett Electric Company d/b/a National Grid Energy Efficiency Program Plan for 2017	**Docket No. 4654**

ENERGY EFFICIENCY PROGRAM PLAN FOR 2017

SETTLEMENT OF THE PARTIES

October 17, 2016

LETTER

Raquel Webster
Senior Counsel

October 17, 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

Dear Ms. Massaro:

I have enclosed ten copies of National Grid's[1] proposed Energy Efficiency Program Plan for 2017 (the 2017 Plan or Plan).[2] The Plan is a Stipulation and Settlement between National Grid, the Rhode Island Division of Public Utilities and Carriers (Division), the Rhode Island Office of Energy Resources (OER), the Energy Efficiency Resources Management Council (EERMC), TEC-RI, Acadia Center, People's Power & Light (PP&L), and Emerald Cities Rhode Island (collectively, the Parties).

The Company is filing the Plan pursuant to the System Reliability and Least Cost Procurement statute, R.I. Gen. Laws § 39-1-27.7 and the Rhode Island Public Utilities Commission's (PUC) Standards for Energy Efficiency and Conservation Procurement, which the PUC approved in Docket 4443 (the Standards). The basis for least cost procurement in Rhode Island is the Comprehensive Energy Conservation, Efficiency, and Affordability Act of 2006 (R.I. Gen. Laws § 39-2-1.2), which encourages the investment in cost-effective energy efficiency. Section 1.1 of the Standards requires the Company to file annually a program plan with implementation details by program for the following program year. The 2017 Plan is consistent with the framework and savings goals established in the Three-Year Energy Efficiency Procurement Plan (Three Year Plan), which the PUC approved in Docket 4522. Below is a summary of the implementation details for the 2017 program year as set forth in the Plan.

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or Company).
[2] The Company is filing the 2017 Technical Reference Manual referenced in the Plan under separate cover.

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The 2017 Plan proposes total budgets of $94.6 million and $29.7 million for electric and gas, respectively. These expenditures are estimated to create substantial annual and lifetime savings for Rhode Island customers. Notably, Rhode Island customers realize $2.00 in benefits for every $1.00 invested in the Plan's electric programs, and $1.63 in benefits for every $1.00 invested in the Plan's natural gas programs. The Company expects that the electric plans will produce lifetime savings of 2,065,732 MWh, which translates into lifetime bill savings of approximately $341 million.[3] The Company expects that the gas plans will produce lifetime savings of 4,945,564 MMBtu, which translates into a lifetime bill savings of approximately $56.9 million.[4] Overall, the Plan will generate economic benefits of more than $314 million over the life of the measures, with $247.9 million in benefits coming from the electric energy efficiency programs, and $66.5 million in benefits coming from the natural gas programs.

The 2017 Plan builds upon the implementation strategies set forth in the Three Year Plan: (i) promoting cost efficiency, (ii) empowering communities and markets to be energy efficient, (iii) innovating to capture untapped savings, and (iv) developing opportunities for system-level savings and integration.

In accordance with the requirements of Least Cost Procurement, R.I. Gen. Laws § 39-1-27.7, to achieve the energy efficiency goals, the Plan proposes a fully reconciling funding mechanism that would increase the current $0.01077 per kWh Energy Efficiency Program (EEP) charge by $0.00047 per kWh, resulting in a total EEP charge of $0.01124 per kWh, for effect January 1, 2017. The Plan proposes a fully reconciling funding mechanism that would increase the current residential $0.748 per dekatherm charge by $0.140 per dekatherm, resulting in a total $0.888 per dekatherm EEP charge for residential gas programs. The plan also proposes a fully reconciling funding mechanism that would increase the current commercial and industrial $0.487 charge by $0.239 per dekatherm, resulting in a total $0.726 per dekatherm EEP charge for commercial and industrial gas programs.[5] There was a significant amount of collaboration and input from the parties regarding the funding levels for the 2017 Plan, and the Company believes that the Plan addresses those concerns in a balanced way while maintaining a stable delivery of energy efficiency services to its customers.

Subsection (c)(5) of the Least Cost Procurement statute provides the EERMC with the specific responsibility of reviewing and approving the cost-effectiveness of the Plan. Therefore, in accordance with the Least Cost Procurement statute, the EERMC has reviewed and approved the 2017 Plan, which complies with all aspects of the Least Cost Procurement statute. In order to deliver the expected economic benefits from the 2017 Plan and to meet the 2017 goals set forth in the Plan, the Company respectfully requests that the PUC approve the 2017 Plan.

[3] Lifetime bill savings are estimated by multiplying lifetime savings by the current residential rates in 2016 dollars.
[4] Lifetime bill savings are estimated by multiplying lifetime savings by current residential rates in 2016 dollars.
[5] These calculations are based on a January 1, 2017 effective date.

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

Sincerely,

Raquel J. Webster

cc: Jon Hagopian, Esq.
Steve Scialabba, Division

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EE PLAN 2017

I. Introduction and Summary

The Narragansett Electric Company d/b/a National Grid (National Grid or Company) is pleased to submit this Energy Efficiency Program Plan (EE Program Plan or Plan) for 2017 to the Rhode Island Public Utilities Commission (PUC). This Plan has been developed by National Grid in collaboration with the Energy Efficiency Collaborative and has been endorsed by the Energy Efficiency and Resource Management Council (EERMC).[1]

This EE Program Plan is submitted in accordance with the Least Cost Procurement law, R.I. Gen. Laws § 39-1-27.7, the basis for which is the Comprehensive Energy Conservation, Efficiency, and Affordability Act of 2006, R.I. Gen. Laws § 39-2-1.2, and the PUC's Standards for Energy Efficiency and Conservation Procurement, as revised by the EERMC and approved by the PUC in Docket 4443 (Standards). This Plan is being jointly submitted as a Stipulation and Settlement, entered into by the Rhode Island Division of Public Utilities and Carriers (Division), the Office of Energy Resources (OER), the EERMC, TEC-RI, Acadia Center, People's Power & Light (PP&L), Emerald Cities Rhode Island, and National Grid (collectively, the Parties), and addresses all issues raised by members of the Collaborative concerning the Company's electric and natural gas energy efficiency (EE) programs for calendar year 2017.

The 2017 Plan satisfies the statutory requirements for Least Cost Procurement and is consistent with the Three-Year Energy Efficiency Procurement Plan (Three-Year Plan) for 2015-2017.[2] The 2017 EE Program Plan is cost-effective and has a cost that is lower than the cost of acquisition of additional supply for both electricity and natural gas, satisfying the requirements prescribed in R.I. Gen. Laws § 39-1-27.7 (a)(2). It also creates significant economic benefits for Rhode Island.

The primary goal of the 2017 EE Program Plan is to create energy and economic cost savings for Rhode Island consumers through energy efficiency, as required by R.I. Gen. Laws § 39-1-27.7. To that end, the 2017 Plan will create annual savings of 201,347 MWh and 414,606 MMBtu and lifetime savings of 2,065,732 MWh and 4,945,564 MMBtu. The Plan will generate benefits of more than $314 million over the life of the measures (with $247.9 million in benefits coming from electric efficiency and $66.5 million in benefits from natural gas efficiency), which represents a large and urgently needed benefit for

[1] A collaborative group (Collaborative) has been meeting regularly since 1991 to analyze and inform the Company's electric and gas energy efficiency programs. Members of the Collaborative presently include the Company, the Division, PP& L, TEC-RI, GHHI, Emerald Cities, and Acadia Center. In addition, the OER and several EERMC members and representatives from the EERMC's Consulting Team participate in the Collaborative group. Since 1991, membership in the Collaborative has varied because some organizations have withdrawn and others have joined.

[2] The Company submitted the EE Procurement Plan to the PUC on September 1, 2014 in Docket 4522. The PUC approved the EE Procurement Plan at an open meeting on October 20, 2014, and in Order 21781, issued on December 19, 2014.

Rhode Island's residential, commercial, industrial, and income eligible energy customers.

In addition, the 2017 Plan provides a meaningful contribution to Rhode Island's energy future. The Rhode Island State Energy Plan (SEP) identifies energy efficiency as the state's "first fuel" and the centerpiece strategy for achieving the Rhode Island Energy 2035 Vision.[3] The SEP identifies energy efficiency as the lowest-risk, lowest-cost, and arguably, the most sustainable energy resource available for Rhode Island. The SEP lists Least-Cost Procurement as one of Rhode Island's cornerstone energy policies, and the primary vehicle for delivering the benefits of energy efficiency to Rhode Island consumers and businesses. Moreover, the strategies defined in the 2017 Plan will contribute to greenhouse gas reductions that may fulfill the Environmental Protection Agency's (EPA) proposed near-term Clean Power Plan requirements, as the plan will avoid 970,894 tons of carbon over the lifetime of the installed measures.[4] Table 1 summarizes the 2017 Plan metrics and goals.[5]

Table 1: 2017 Energy Efficiency Program Plan Summary

Electric Programs by Sector	Implementation Spending in 2017 ($000)	Customer Contribution ($000)	Annual MWh Savings	Annual kW Savings	Lifetime MWh Savings	Total Benefits ($000)	TRC B/C Ratio	TRC ¢/lifetime kWh	Participants
Non-Income Eligible Residential	$31,798.4	$9,350.9	90,254	10,337	591,825	$59,704.9	1.40	7.0	517,648
Income Eligible Residential	$11,976.5	$0.0	7,076	797	74,174	$42,526.7	3.38	16.1	5,519
Commercial and Industrial	$44,735.6	$20,183.7	104,017	17,409	1,399,733	$145,640.2	2.17	4.6	3,133
Regulatory	$1,632.5								
Subtotal	**$90,143.1**	**$29,534.6**	**201,347**	**28,543**	**2,065,732**	**$247,871.8**	**2.00**	**5.8**	**526,299**

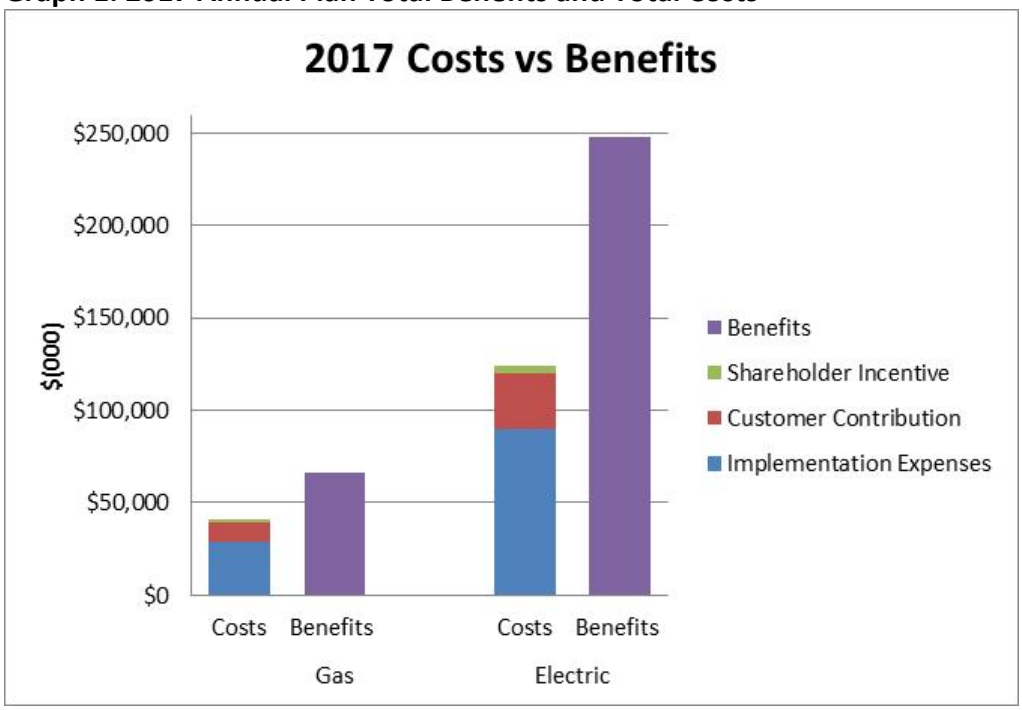
Gas Programs by Sector	Implementation Spending in 2017 ($000)	Customer Contribution ($000)	Annual MMBtu Savings		Lifetime MMBtu Savings	Total Benefits ($000)	TRC B/C Ratio	TRC $/lifetime MMBtu	Participants
Non-Income Eligible Residential	$12,295.7	$7,760.2	138,237		1,594,705	$24,996.7	1.21	12.58	107,829
Income Eligible Residential	$5,857.2	$0.0	26,842		499,770	$13,928.1	2.38	11.72	3,299
Commercial and Industrial	$9,598.1	$3,231.8	249,527		2,851,089	$27,633.6	2.08	4.50	1,188
Regulatory	$608.5								
Subtotal	**$28,359.5**	**$10,992.0**	**414,606**		**4,945,564**	**$66,558.4**	**1.63**	**7.96**	**112,316**
Total for Plan	**$118,502.6**	**$40,526.6**				**$314,430.2**	**1.91**		**638,615**

(1) Implementation spending does not include customer contributions, shareholder incentive, or commitments.
(2) Regulatory Includes contributions to OER and EERMC

[3] Energy 2035: Rhode Island State Energy Plan. October 8, 2015. http://www.energy.ri.gov/energyplan/
[4] Carbon multiplier of 0.47 tons/MWh obtained from the 2014 ISO New England Electric Generator Air Emissions Report. Available at: https://www.iso-ne.com/static-assets/documents/2016/01/2014_emissions_report.pdf
[5] Consistent with the planning process articulated in the EE Procurement Plan in Docket 4522, National Grid has examined the planning assumptions, supply costs, program enhancements, and corresponding budgets using the most robust data available for this Plan. Consequently, the TRC cent per kWh and TRC dollar per lifetime MMBtu are lower than projected in the EE Procurement Plan.

As noted above, the savings meet Rhode Island law requirements for cost-effectiveness. As defined by the Standards approved by the PUC in Docket 4443, the Plan's Total Resource Cost Test ratio (TRC Test) - the ratio of Total Benefits/Total Costs – must be greater than 1.0.[6] The overall electric EE Program TRC Test ratio is 2.00, and the overall natural gas EE Program TRC Test ratio is 1.63.

Graph 1. 2017 Annual Plan Total Benefits and Total Costs



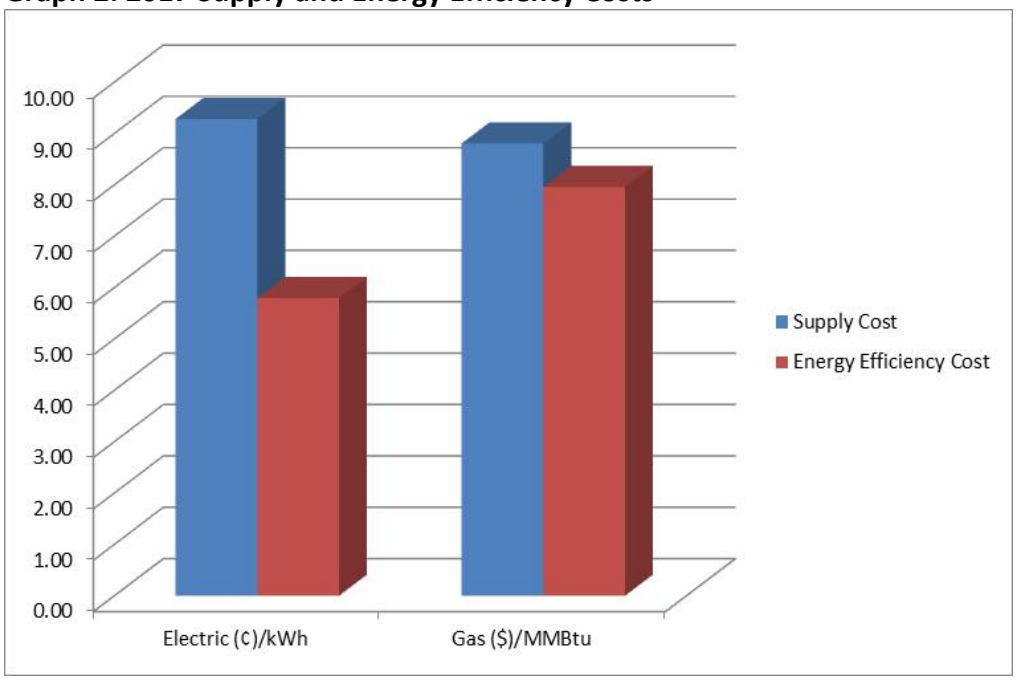
In addition to satisfying the primary statutory requirement of cost-effectiveness, the Plan satisfies the additional requirement that the cost of energy efficiency procured be less expensive than the cost of supply. The cost of electric energy efficiency is 5.79¢ per lifetime kWh saved, which is 3.49¢ less than the cost of supply, 9.28¢ per kWh.[7] The cost of natural gas energy efficiency is $7.96 per lifetime MMBTU saved, which is $0.85 less than the cost of supply for residential heating customers, $8.81 per MMBTU.[8]

[6] See *Standards for Energy Efficiency and Conservation Procurement*, Section 1.2.A.2.

[7] The electric supply cost is based on the Residential Standard Offer Charge effective from October 1, 2016 until March 31, 2017, Please see: http://www9.nationalgridus.com/narragansett/non_html/SOS_Rates_Table_Residential.pdf. It is levelized over the average lifetime of all measures in the plan. Additionally, the Commercial Customer Group fixed price option for October 1, 2016 until March 31, 2017 is a levelized cost of 9.53¢. Please see: http://www9.nationalgridus.com/narragansett/non_html/SOS_Rates_Table_Commercial.pdf

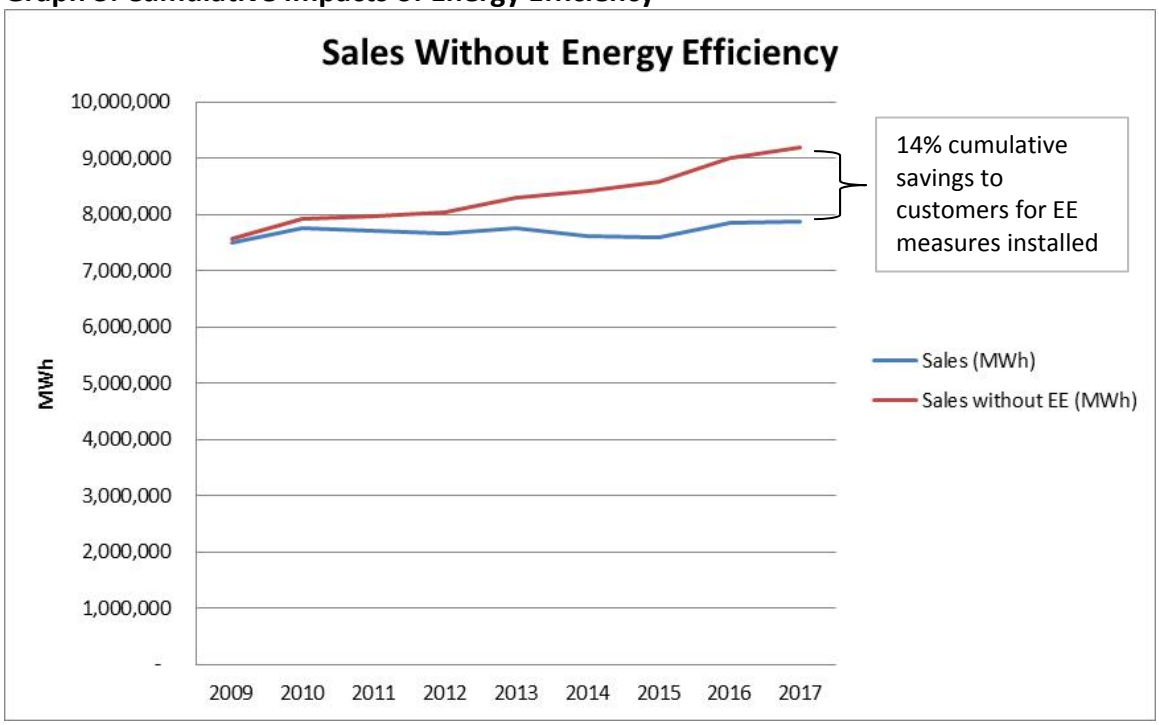
[8] The natural gas supply cost is based on the residential heating gas avoided cost calculation from the Avoided Energy Supply Costs in New England: 2015 Report for year 2017, and is levelized over the average lifetime of all measures in the plan. The C&I gas charge is also is a levelized cost of $7.85.

Graph 2: 2017 Supply and Energy Efficiency Costs



Over time, the benefits of procuring energy efficiency at a cost less than supply accrue to customers. Graph 3 shows the cumulative energy savings for just those energy efficiency measures installed since 2009 (the first year of programs implemented under Least Cost Procurement). Because the average measure life of energy efficiency measures is 10 years, it is expected that measures installed in 2009 are still providing the same level of energy savings through 2017. This is true for those measures installed in and after 2009. The only exception is the savings from Home Energy Reports. This program only has a one-year measure life so those savings are only counted in one year. In Graph 3 below, the area between the blue and red lines represents the cumulative annual MWh savings for measures installed since 2009. All these MWh savings were obtained at a cost lower than the cost of supply. Without energy efficiency, Rhode Island customers would have had to purchase 14% more energy at a higher cost.

Graph 3: Cumulative Impacts of Energy Efficiency



This Plan, supported by the Collaborative and the EERMC, will cement Rhode Island's position as a recognized national leader in energy efficiency to the benefit of the State's population through cost savings and additional significant economic benefits, such as increased gross state product (GSP) and job creation. Investments made in energy efficiency under the 2017 Plan are expected to add over $432.5 million to Rhode Island's GSP and create more than 4,718 job-years of employment.[9] For each $1 invested, electric programs will create $2.00 of economic benefits over the lifetime of the investment, and natural gas efficiency investments will create $1.63 in economic benefits over the lifetime of the investments. Rhode Islanders will receive a total of $314 million in benefits from the 2017 energy efficiency plan investments.

The aggressive energy and cost savings for the 2017 program year are consistent with the objectives and requirements of Least Cost Procurement and meet the savings targets approved by the PUC at the Open Meeting on June 10, 2014 in Docket 4443. The electric savings goal proposed for 2017 is 201,347 MWh, or 2.60% of the referenced 2012 load. The natural gas savings goal for 2017 is 414,606, or 1.10% of 2012 natural gas load, and is consistent with the approved targets for 2017 in the EE Procurement Plan approved in Docket 4522.

[9] Macroeconomic multipliers for the economic growth and job creation benefits of investing in cost-effective energy efficiency from "Macroeconomic Impacts of Rhode Island Energy Efficiency Investments: REMI Analysis of National Grid's Energy Efficiency Programs", National Grid Customer Department, November, 2014.

The following table compares the 2017 Annual Plan components to the 2015-2017 Three-Year Plan.

Table 2: 2017 Annual Plan compared to Three-Year Plan for Year 2017

Electric Programs	2017 3 Year Plan	2017 Annual Plan
Annual MWh Savings	201,347	201,347
Lifetime MWh Savings	2,164,927	2,065,732
Annual Peak kW Savings	32,181	28,543
Total Benefits	$ 316,528,156	$ 247,871,847
Total Spending	$ 90,867,248	$ 94,568,586
Benefit Cost Ratio	2.76	2.00
TRC Dollars per lifetime kWh	$ 0.053	$ 0.058
EE Program Charge per kWh	$ 0.00941	$ 0.01124
Gas Programs	**2017 3 Year Plan**	**2017 Annual Plan**
Annual MMBtu Savings	414,606	414,606
Lifetime MMBtu Savings	4,536,303	4,945,564
TRC $/Lifetime MMBtu	$ 7.28	$ 7.96
Total Benefits	$ 67,758,168	$ 66,558,401
Total Spending	$ 27,388,832	$ 29,747,068
Benefit Cost Ratio	2.05	1.63
C&I EE Program Charge per Dth	$ 0.629	$ 0.726
Residential EE Program Charge per Dth	$ 0.768	$ 0.888

Each year, the Company creates an Annual Plan that attempts to meet the savings targets set out in the Three-Year Plan while keeping within the requirements of the law that the Plan must be cost-effective and less than the cost of supply. However, as noted in previous PUC dockets, Annual Energy Efficiency Program Plans may contain budgets and EE Program Charges that vary from those contained in the Three-Year Plan.[10] The Three-Year Plan creates savings targets and illustrative budgets to guide the Company in the development and long-term strategy of its Annual Plans over the upcoming Three-year period. After the Three-Year Plan is filed there are numerous factors that can lead to changes in funding needs and savings availability. These include: updates to the avoided cost study, electric and gas sales, available fund balance, Regional Greenhouse Gas Inc. (RGGI) auction revenue and ISO-New England's (ISO-NE) Forward Capacity Market (FCM) auction proceeds, evaluation results, market conditions, and customer preferences. This can be seen in Annual Plan filings where budgets and charges increase

[10] PUC Order No. 21781 approving National Grid's September 2, 2014 Energy Efficiency and System Reliability Procurement Plan for three-year period 2015-2017. Written Order issued 12/19/14.

or decrease compared to the Three-Year Plans due to changing market conditions. Three notable examples of this type of deviation were contained in each of the Company's Energy Efficiency Program Plans for 2013, 2014, and 2016. In the 2013 Annual Plan (Docket 4366), the Company received PUC approval to exceed the electric budget filed as part of the 2012-2014 Three-Year Plan to, in part, accommodate a funding commitment to the Toray Plastics (America), Inc. (Toray) combined heat and power (CHP) project.[11] In the 2014 Plan (Docket 4451), the Company received PUC approval to increase the electric savings target approved by the PUC in Docket 4202 by 35% to accommodate the Toray CHP project.[12] Finally, the gas energy efficiency charge for 2016, approved in Docket 4580, was less than the charge illustrated in the 2015-2017 Three-Year Plan, because of a large positive fund balance projected at year end 2015.

For the 2017 Annual Plan, the electric and natural gas energy efficiency portfolio budgets and EE Program Charges are higher than the illustration presented in the Three-Year Plan. There are several factors contributing to this difference.

For the electric sector, current sales projections are lower by 403,189,072 kWh, which places upward pressure on the EE Program Charge. There is a projected negative fund balance for Program Year 2016 that must be fully reconciled in 2017 pursuant to R.I. Gen. Laws § 39-1-27.7. The Rhode Island Infrastructure Bank (RIIB) requested $5M from the Company for 2017 that was not anticipated in the Three-Year Plan. The Company is also expected to receive less RGGI auction revenues but more FCM auction proceeds than in the Three-Year Plan. Finally, recent evaluation results for the Energy*Wise* Single-Family and Multifamily programs are increasing the cost of energy savings.

For the gas sector, current sales projections are lower by 418,248 Dth, which places upward pressure on the EE Program Charge. Unlike the 2016 EE Plan where there was a positive projected year-end fund balance, for the 2017 EE Plan, there is a projected negative fund balance for Program Year 2016 that must be fully reconciled in 2017 pursuant to R.I. Gen. Laws § 39-1-27.7. In addition, similar to the electric sector, recent evaluation results for the Energy*Wise* Single-Family and Multifamily programs are increasing the cost of energy savings.

While both the electric and gas portfolio meet the savings targets set forth in the Three-Year Plan, lifetime savings are different. The electric lifetime MWh savings for the electric programs are projected to be slightly lower. The lifetime MWh is lower primarily due to improved lighting standards in the lighting market from the Energy Independence and Security Act (EISA). For example, as lighting standards increase due to EISA, fewer incandescent bulbs will be readily available. Therefore, regional energy efficiency programs will no longer claim savings relative to those incandescent bulbs.

[11] PUC Order No. 20911 approving Settlement of the Parties submitted in Dockets 4366 & 4367.
[12] PUC Order No. 21298 approving National Grid's 2014 EEPP.

The lifetime MMBtu savings are higher than in the Three-Year Plan due to National Grid's programmatic choices, whereby more savings are projected to come from the commercial sector to make up for lower savings in the residential sector due to recent evaluation results.

Total Benefits for electric programs are projected to be lower than the three-year illustration in Table 2. As in 2016, this is primarily due to notable changes in the 2015 Avoided Energy Supply Costs study. The study forecasted less Demand Reduction Induced Price Effects (DRIPE) than in the previous study due to the fact that the ISO-NE market has reached equilibrium. The second major change was that the study found a lower cost for gas, which affects the avoided costs of both gas and electricity. This is due to the fact that the commodity price of gas decreased due to increased supply being extracted from the Marcellus shale region. The Company is assuming that a lower percentage of the distribution investments associated with load growth can be deferrable through energy efficiency, based on the amount of recent distribution investments allocated to asset condition or non-deferrable projects. Finally, for avoided distribution benefits, the Company has updated the treatment of line losses in the benefits calculation. Due to these factors, the avoided costs benefits have decreased in 2017.

Total Benefits for gas programs are projected to be higher than the three-year illustration in Table 2. This is primarily due to more savings coming from the commercial sector which leads to longer lifetime savings and, therefore, more benefits. The other contributing factor is the application of additional non-resource benefits to income eligible programs from updated evaluation results.[13]

This cost-effective 2017 EE Program Plan includes an investment of $94.6 million for electric energy efficiency implementation in 2017. If approved, this will be funded by the existing energy efficiency program charge of $0.01077 per kWh, as well as other funding sources including ISO-NE FCM auction revenue and RGGI auction proceeds. Pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5), a fully reconciling mechanism of $0.00047 per kWh is needed to fully fund the cost-effective electric energy efficiency programs for 2017. This funding will generate economic benefits of $247.9 million for Rhode Island electric customers.

This Plan also includes a $29.7 million investment in cost-effective natural gas energy efficiency implementation. If approved, this investment will be funded by the existing energy efficiency program charge of $0.748 per dekatherm for residential customers and $0.487 per dekatherm for non-residential customers. Pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5), a fully reconciling mechanisms of $0.140 per dekatherm for residential

[13] Massachusetts Special and Cross-Cutting Research Area: Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEIs) Study. Prepared by the NMR Group and Three3, Inc. for the Massachusetts Program Administrators. August 5, 2016.

customers and $0.239 per dekatherm for non-residential customers will be needed to fully fund the cost-effective natural gas energy efficiency programs for 2017. The programs will generate economic benefits of $66.5 million.

The savings that customers will realize from participating in the energy efficiency programs will offset the energy efficiency program charge. Bill impacts analyses of both the gas and electric programs shows that the average participant will save more than they invest through the energy efficiency program charge. Non-participants benefit from power market effects and avoided investment in infrastructure due to energy efficiency that are also reflected in rates. When the impacts on both participants and non-participants are averaged, the analysis shows that the average Rhode Island customer sees bill savings from energy efficiency. One of National Grid's objectives is to reach as many customers as possible to increase the participant and overall bill savings in Rhode Island.

II. Strategies to Achieve Goals

The primary goal of the 2017 EE Program Plan is to create economic value and cost savings for Rhode Island through energy efficiency. The Plan achieves this goal by implementing the following key strategies, introduced in Docket 4522:

- **Promoting Cost Efficiency –** the Company will continue to focus its efforts to identify strategies to deliver energy efficiency services as cost-effectively as possible, while continuing to optimize the net-benefits of energy efficiency to customers.
- **Empowering communities and markets to be energy efficient** – the Company will implement strategies to increase awareness of energy efficiency programs through the enhancement of existing programs to reach new and repeat customers, leveraging existing partnerships and forging new ones, and enhancing marketing and analytical tools to target customers more effectively.
- **Innovating to capture untapped savings** – the Company will continue to play a leading role in deploying such technologies to better drive both energy savings and customer program participation.
- **Developing opportunities for system-level savings and integration** – the Company will work with partners to research, develop, and integrate distributed energy resources into the various aspects of Least Cost Procurement. The Company's new Renewable Energy Growth Program and related initiatives will further this goal.

The application of these strategies is more fully described in the detailed program and marketing descriptions in Attachments 1 and 2.

III. Delivering 2017 Goals

National Grid will build on its almost thirty years of experience in order to deliver the energy and cost savings goals in this Plan.[14]

A. Residential Programs

In 2017, the Parties agree to continue the residential programs offered in 2016. The Parties also agree to offer new programs and demonstrate the development of new technologies for potential inclusion in programs in future years. The programs are summarized below and described in further detail in Attachment 1. The description of each program includes proposed changes from 2016 that are intended to help meet the savings targets for 2017.

Table 3. Proposed Residential Energy Efficiency Programs	
Residential Buildings Efficiency Programs	
EnergyWise Program (Funded by Gas and Electric)	Energy*Wise* offers single-family customers home energy assessments and information on their actual energy usage. Participants in this program receive recommendations and technical assistance as well as financial incentives to replace inefficient lighting fixtures, appliances, thermostats, and insulation levels with models that are more energy efficient. The program addresses base load electric use and heating and cooling energy loads in all residential buildings. The program recommends efficient products that are delivered through National Grid's various programs as well as solar opportunities provided through Statewide solar initiatives. The program will continue to deliver finance opportunities to customers such as the Heat Loan and support the Residential Property Assessed Clean Energy (PACE) when it begins in the latter half of 2017. The program will also continue to offer weatherization incentives to customers who heat with oil and propane.
Multifamily Programs Income Eligible, Residential and Commercial sectors (funded by Gas and Electric)	Comprehensive energy services for multifamily customers include energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting, and appliances. Coordinated services will be offered for all types of multifamily properties. An approach tailored for multifamily properties designates a primary point-of-contact to manage and coordinate services offered through the Company's existing portfolio, including EnergyWise, C&I Retrofit, Residential New Construction, Income Eligible, and the ENERGY STAR® HVAC programs.

[14] Throughout the program year, the Parties may consider additional enhancements beyond those identified in this Plan as more information becomes available to support an informed review of those potential changes. As part of this process of identifying additional enhancements, in addition to continuing to meet with the Collaborative, the Company will continue its work sessions with the EERMC's consultants.

Income Eligible Single Family (Funded by Gas and Electric)	Income Eligible Services, also known as the Single Family Low Income Services, are delivered by local Community Action Program (CAP) agencies with oversight provided by a Lead Industry Partner. Three levels of home energy assessments will be offered: (1) lighting and appliance focus, (2) heating and weatherization focus, and (3) comprehensive focus. Customers qualifying for LIHEAP are eligible and receive all services and equipment upgrades at no cost.

Residential Buildings Efficiency Programs	
Residential New Construction (Funded by Gas and Electric)	The program promotes the construction of high-performing energy efficient single family, multifamily, and low income homes, as well as the education of builders, tradesmen, designers, and code officials. RNC has been overhauled over the past few years to make it more performance oriented.
Education Programs (Funded by Electric)	The Company promotes energy education to private and public schools and youth groups through the National Energy Education Development (N.E.E.D) Program. This program provides curriculum materials and training to students and teachers in grades K-12.
Residential Home Energy Report Program (Funded by Electric and Gas)	The Company will continue to deliver Home Energy Reports that offer enhanced feedback tools to inspire customers to take actions that reduce their energy consumption and also increase their participation in other energy efficiency programs.
Community Based Initiatives (C&I and Residential, Funded by Electric and Gas)	The initiative is designed to leverage trusted community partnerships and develop targeted marketing strategies in order to promote all energy efficiency programs, residential and commercial, in specific targeted communities or businesses.
ENERGY STAR® Lighting (Funded by Electric Only)	This is an initiative implemented jointly with other regional utilities. It provides discounts to customers for the purchase of ENERGY STAR® lighting through instant rebates, special promotions at retail stores, mail-order catalog, pop-up retailer, and social marketing campaigns.
Residential Consumer Products (Funded by Electric Only)	The program is run in collaboration with other regional utilities to promote the purchase of high efficiency household appliances, including kitchen appliances and electronics. These appliances carry an ENERGY STAR® label. The program also offers refrigerator recycling, which promotes more efficient refrigerators while removing non-efficient units from the market.
ENERGY STAR® HVAC Program (Funded by Electric and Gas)	This program promotes the installation of high efficiency central air conditioners for electric customers and new energy efficient natural gas related equipment including boilers, furnaces, water heating equipment, thermostats, boiler reset controls, and furnaces equipped with high efficiency fans. The program provides training of contractors in installation, testing of the high efficiency systems, tiered rebates for new ENERGY STAR® systems, and incentives for checking new and existing systems. The program also includes the oil and propane heating equipment rebates.

Residential Demonstration and Research and Development (Funded by Electric and Gas)	The demonstrations test innovative technologies for saving both gas and electricity.

B. Residential Income Eligible Programs

The Company and the Collaborative want customers who have a high energy burden and/or difficulty paying their electric bills to participate in, and benefit from, the Company's energy efficiency programs, especially in these difficult economic times. For that reason, this segment of the customer base is designated as a unique sector, and funding for this sector will be subsidized by both non-low-income residential customers and commercial and industrial customers using 13% of total implementation funding for the electric programs, and 21% for natural gas programs.

In addition to the Income Eligible Single Family and Multifamily programs, the Residential New Construction Program also works with housing authorities and developers to build energy-efficient multifamily properties. Additional details about the services offered to economically disadvantaged customers are described in the residential programs in Attachment 1.

C. Commercial and Industrial Programs

The Parties agree to continue in 2017 the commercial and industrial programs offered in 2016, and pilot the development of new technologies for potential inclusion in programs in future years. These programs are summarized in Table 4 below.

Table 4. Proposed Commercial and Industrial Energy Efficiency Programs	
Small Business Direct Install (Gas and Electric)	The Small Business Direct Install Program provides direct installation of energy efficient lighting, non-lighting retrofit measures, and gas efficiency measures. Electric customers with average monthly demand of less than 200 kW are eligible to participate. There is no eligibility criterion for gas consumption. The program's lighting and non-refrigeration measures are delivered through one labor and one product vendor selected through a competitive bidding process. The customer pays 30% of the total cost of a retrofit. This amount is discounted 15% for a lump sum payment or the customer has the option of spreading the payments over a two-year period interest free.

Table 4. Proposed Commercial and Industrial Energy Efficiency Programs	
Large Commercial Retrofit (Gas and Electric)	Large Commercial Retrofit is a comprehensive retrofit program designed to promote the installation of energy efficient equipment such as lighting, motors, and heating, ventilation and air conditioning (HVAC) systems, thermal envelope measures, and custom measures in existing buildings. All commercial, industrial, and institutional customers are eligible to participate. The Company offers technical assistance to customers to help them identify cost-effective efficiency opportunities, and pays incentives to assist in defraying part of the material and labor costs associated with the energy efficient measures.
Large Commercial New Construction (Gas and Electric)	Promotes energy efficient design and construction practices in new and renovated commercial, industrial, and institutional buildings. The program also promotes the installation of high efficiency equipment in existing facilities during building remodeling and at the time of equipment failure and replacement. Large Commercial New Construction is known as a lost opportunities program because a customer who does not install energy efficient equipment at the time of new construction or equipment replacement will likely never make the investment for that equipment or will make the investment at a much greater cost at a later time. The program provides both technical and design assistance to help customers identify efficiency opportunities in their new building designs and to help them refine their designs to pursue these opportunities. The program also offers incentives to eliminate or significantly reduce the incremental cost of high efficiency measures over standard efficiency measures. Incentives are also offered to owner's design teams for their time and effort to meet program requirements. Operations Verification or quality assurance is also offered to ensure that the equipment and systems operate as intended.
Commercial and Industrial Demonstrations and Research and Development (Funded by Electric and Gas)	The demonstrations test innovative technologies for saving both gas and electricity.

Descriptions of these programs are provided in Attachment 2. Included in the description of each program are proposed changes from 2016 that are intended to help meet the savings targets for 2017.

D. Other Program Highlights

1. Overcoming Financial Barriers

In most cases, with the exception of income eligible programs and services, the Company's offerings do not cover 100% of project costs. Over the past year, the State and Council have made progress researching, planning, and developing opportunities for finance mechanisms that will help customers overcome cost barriers which impede investing in energy efficiency. The Company's 2017 plan supports these activities in a variety of ways.

For large and small commercial customers, the Company will continue to offer finance for customer costs through on-bill repayment from its revolving loan funds. The Company is proposing that $1.3 million of new electric energy efficiency program charge collections ($1.0 million for large C&I and $0.3 million for small C&I) and $0.5 million of gas program charge collections in 2017 be transferred to the electric and gas revolving loan funds.[15] The Company is proposing these injections to support the sustained longevity of these loan funds. A recent evaluation of the Company's Large C&I revolving loan fund by The Cadmus Group, Inc. (Cadmus) concludes that the loan fund requires substantial future allocations to fulfill its potential for increased participation in 2017 and beyond. Cadmus also recommends the establishment of a funding schedule that will support future participation projections. Stable fund injections will provide the C&I sales team to better leverage the dollars available in the fund and market financing to more customers.[16] In addition to these recommendations the Company views the proposed 2017 large C&I loan fund injection as a means to help ensure that funds are available for commitments in early 2018. An injection in 2017 will help ensure that the end of year balance is sufficient to cover commitments made in late 2017 and early 2018 before potential 2018 fund injections and repayments become available. The Company believes a modest injection to the loan fund in 2017 will adhere to the recommendations set forth in the Cadmus evaluation and ensure stable growth of the fund going forward.

For municipal customers, the Company will support the Rhode Island Infrastructure Bank (RIIB) in establishing and implementing the Efficient Buildings Fund (EBF), as well as support its commercial property assessed clean energy (PACE) efforts for all C&I customers. To support the State's complementary work in this area, at RIIB's request, the Company will earmark $5.0 million of additional funds to support energy efficiency transactions through EBF for 2017. According to RIIB, this will leverage an estimated $25 million of energy efficiency projects, and contribute to the achievement of energy savings objectives. In 2016, the Company was required to collect approximately $1.8 million for RIIB's EBF. In 2017, National Grid will hold the funds collected until RIIB instructs the Company to transfer the money in writing. The Company will not manage, administer, provide any services or submit payments to other parties or customers in relation to the money collected on behalf of RIIB. Furthermore, National Grid and RIIB will work together to develop reporting frameworks and regular communication formats

[15] To satisfy accounting internal audit procedures, the Company notes that, with its approval of this plan, the PUC would be authorizing this transfer.

[16] The Cadmus Group, Inc., Large Commercial and Industrial On-Bill Repayment Program Evaluation, September 20, 2016.

to ensure that energy efficiency performance of these funds is meeting expectations. Specific details about these activities are described in the Affordability and Finance section of Attachment 2. National Grid's revolving loan fund projections for 2017 are illustrated in Attachment 5, Table E-10 and Attachment 6, Table G-10. Interest is not applied to the revolving fund balances or funds collected on behalf of RIIB.

For residential customers, the Company will continue to offer the Heat Loan, which buys down interest on loans from a network of local banks. The Company anticipates that in 2017 the Heat Loan will serve approximately 1,200 customers at a cost of $1.3 million. However, exact amounts will depend on the value of the loans. The Company will also continue to offer the Heat Loan through the Capital Good Fund which is a non-profit specializing in transformative financial services for underserved families. The Company encourages and anticipates that RIIB, in collaboration with the OER, will implement Residential PACE during the second half of 2017. PACE offers customers opportunities to finance energy efficiency upgrades through special assessment payments attached to properties. The Company will promote Residential PACE opportunities during home energy assessments. The Company will also support and facilitate ongoing research that the Council identifies on the topic. Details about residential finance opportunities are further described in EnergyWise section of Attachment 1.

2. Delivered Fuels Weatherization

Weatherization and support of energy efficiency projects in non-income eligible homes heated by delivered fuels (primarily oil and propane) is an important objective in Rhode Island, where more than 35% of customers heat with delivered fuels. Parties have struggled since 2010 to develop a long-term solution for this objective, using a variety of sources (ARRA funds, RGGI, funds, energy efficiency program funds). In recent years, substantial funding has been received from the OER as a grant from RGGI funds. For 2017, OER has made no such specific allocation. Therefore, in order to maintain and expand services, the Company proposes that $1.3 million of funding and services through the EnergyWise program. In 2017, the Company will track and report delivered fuels savings in gallons or MMBtu of savings associated with these efforts.

The Company pledges to continue to work with interested parties to explore and develop other options to achieve a long-term solution to support and expand delivered fuels weatherization services. These may include revision and submission of legislation to provide a stable source of funding, and the development and implementation of Residential PACE to enable a larger percentage of weatherization and boiler/furnace replacement costs to be financed. Should this long term solution include an expansion of services through the Company's programs over currently proposed levels, the Parties agree to consider creating delivered fuels savings targets, budgets, and a shareholder incentive mechanism to increase focus on this objective.

3. Participation

Each program described in this Plan seeks to drive customer participation in order to deliver the benefits of energy efficiency to customers throughout Rhode Island. The Plan is designed to provide equitable access to savings and programs across sectors and market segments. For 2017, the Company will continue to plan and report participation in 'net' terms, which takes into account free-ridership and spillover, which are commonly referred to as net-to-gross factors. This method of accounting for participants aligns participation numbers with energy savings numbers, which are already recorded in net terms. This approach provides a more accurate connection between energy savings and those customers who benefit efficiency programs. Planned participation estimates may be found in Attachment 5, Table E-7 and Attachment 6, Table G-7

The following table describes the definitions for how National Grid projects, tracks and reports participation in the efficiency programs.

Table 5: Participation Definitions

Fuel	Sector	Program	Participation Unit
Gas	Commercial & Industrial	Large Commercial New Construction	Unique Billing Account
		Large Commercial Retrofit	Unique Billing Account
		Small Business Direct Install	Unique Billing Account
		C&I Multifamily	Housing Units
	Income Eligible Residential	Single Family – Income Eligible Services	Unique Billing Account
		Income Eligible Multifamily	Housing Units
	Residential	Energy Star® HVAC	Unique Billing Account
		EnergyWise	Unique Billing Account
		EnergyWise Multifamily	Housing Units
		Home Energy Reports	Adjusted* Unique Billing Account
		Residential New Construction	Housing Units
Electric	Commercial & Industrial	Large Commercial New Construction	Unique Billing Account
		Large Commercial Retrofit	Unique Billing Account + Unique Customer names from Upstream Lighting
		Small Business Direct Install	Unique Billing Account

Fuel	Sector	Program	Participation Unit
	Income Eligible Residential	Single Family – Income Eligible Services	Unique Billing Account
		Income Eligible Multifamily	Housing Units
	Residential	Energy Star® HVAC	Unique Billing Account
		EnergyWise	Unique Billing Account
		EnergyWise Multifamily	Housing Units
		Home Energy Reports	Adjusted* Unique Billing Account
		Residential New Construction	Housing Units
		ENERGY STAR® Lighting	Estimated Housing Units
		ENERGY STAR® Products	Number of Rebates

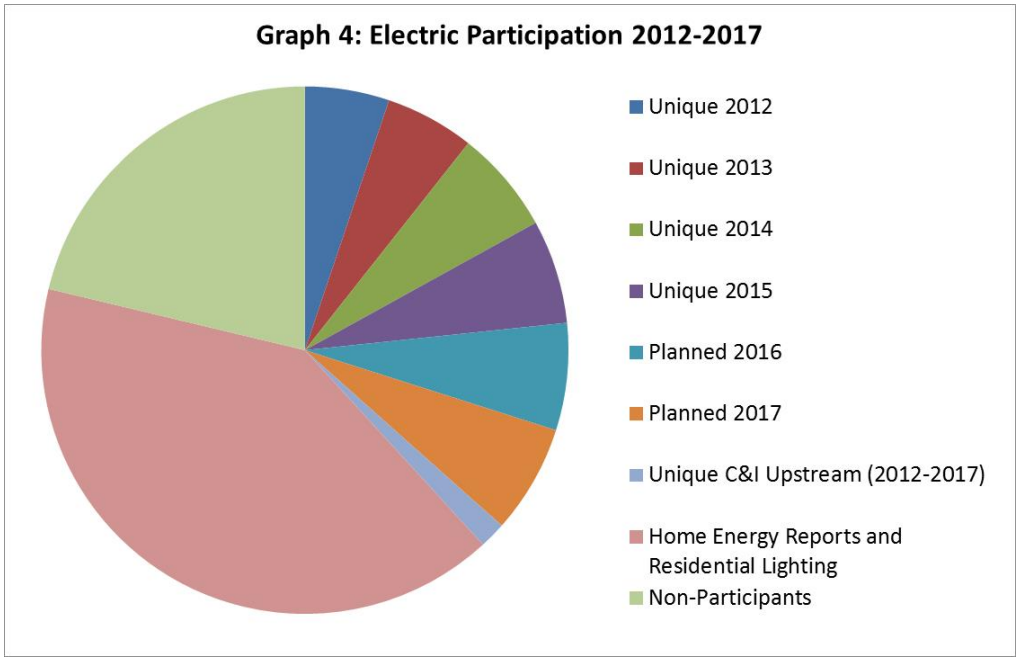
* For Home Energy Reports, participants will be counted as the number of customers receiving reports (i.e., the "treatment group") adjusted by the "Read Rate" of 75% from the most recent Customer Engagement Tracker Survey.

The Company also aims to estimate the number of unique participants for each program. For some programs such as ENERGY STAR® Lighting and ENERGY STAR® HVAC, one measure does not necessarily equal one participant. This is because a customer can purchase more than one measure. Therefore, the Company also considers the previous year's unique accounts to savings ratio in order to estimate the planned unique participants in 2017. This method allows for a better estimation of unique participants but can make it more difficult to compare planned numbers across years.

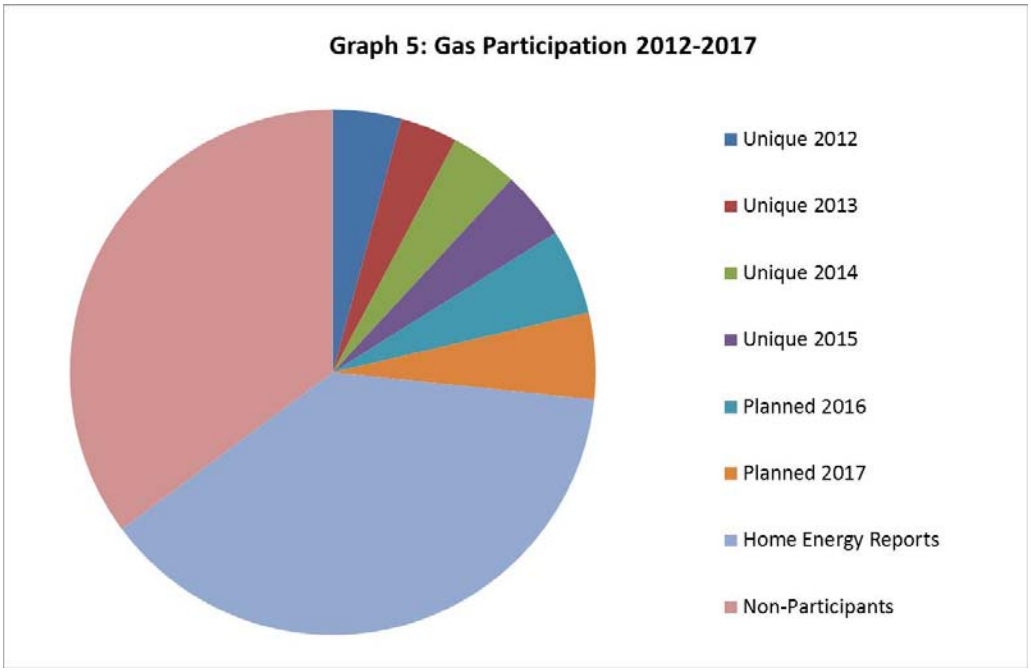
In 2017, the Company will continue to drive participation through two main pathways – targeted programs and broad based programs. Targeted programs include the Company's retrofit, new construction, product rebate, and direct install initiatives. These programs serve to drive deeper savings to targeted customer segments and offer a wide array of energy efficiency measures. The Company also reaches broad participation through its upstream commercial and residential lighting programs, and Home Energy Reports. These broader based programs provide value by reaching a wide and diverse set of customers, helping to provide more customers with access to energy savings, as well as acting as a gateway to drive participation in other National Grid EE programs.

A recent analysis of unique participation since 2012 is detailed in Graphs 4 and 5 below. From 2012-2015 the Company served approximately 25% of its electric customers and 18% of its gas customers from its targeted based programs at least once (these graphs have removed duplicate participation across programs and years 2012-2015). From 2012-2015, the broader programs have reached approximately 42% of electric

customers and 38% of gas customers.[17] Planned 2016 and 2017 participants are also included in these graphs for illustrative purposes.



*2016 and 2017 planned values are preliminary until the year-end reports are finalized and duplicate participation across programs and years can be applied. Home Energy Reports participation is adjusted by the "Read Rate" of 75% from the most recent Customer Engagement Tracker Surveys.



*2016 and 2017 planned values are preliminary until the year-end reports are finalized and duplicate participation across programs and years can be applied. Home Energy Reports participation is adjusted by the "Read Rate" of 75% from the most recent Customer Engagement Tracker Surveys.

[17] The full participation analysis can be found in Docket 4527 - National Grid Electric and Gas Energy Efficiency Programs 2015 Year-End Report, filed May 2, 2016.

In 2017, the Company will work to reach even more unique customers, or those that have never participated in its EE programs, and customers that have previously participated that can still benefit from the installation of additional EE measures. Many of the unique participants captured above are still eligible for additional programs, for example a participant in the EnergyWise Single Family program may participate in the HVAC program.

To provide more detail on trends in participation, the Company will again provide a detailed analysis in its 2016 Year-End Report showing additive and cumulative portfolio participation.

4. Creating and Sustaining Energy Jobs

Delivery of energy efficiency savings is a large effort, involving a large number of people. One of the most evident economic benefits that energy efficiency creates in RI is the number of jobs created or sustained in the energy sector. Each year, National Grid reports on the number of jobs supported by its RI energy efficiency programs. The report is included in National Grid's Year-End Report, which is submitted to the PUC, and available on the Council's website. The 2015 report found that the energy efficiency programs supported 695.8 full-time equivalent (FTE) workers across 1,009 different firms, more than 79% of which were located in Rhode Island.

Additionally, National Grid has conducted a number of workforce development activities throughout the State that it will continue in 2017. Examples of the Company's activities include the Codes Initiative, which offers continuing education credits related to energy codes for design and construction professionals. In order to help our contractors develop the skills needed to effectively deliver our programs, the Company has also conducted the following trainings: code training for residential new construction; in-field technical training for residential new construction; weatherization training for our Community Action Partners and their weatherization staff; and technical training for HVAC contractors. Additionally, the Company offers professional certifications for facility managers through its Building Operator Certification course, which teaches energy efficient techniques for optimizing energy management. National Grid also sponsors the Rhode Island Home Show, and in 2017, the show will promote job and workforce development.

5. System Reliability Procurement

In a contemporaneous filing, the Company is submitting its System Reliability Procurement (SRP) Annual Report for 2017 for the PUC's review and consideration. The SRP Annual Report describes the strategies, goals, and funding request for SRP in 2017 to continue an existing pilot to defer an anticipated distribution upgrade in the towns of Tiverton and Little Compton. As detailed in that filing, some of the non-wires strategies proposed in 2017 are cost-effective targeted energy efficiency programs, which will leverage existing programs. The cost of the existing programs that may be leveraged is

part of the energy efficiency budget illustrated in Attachment 5, Table E-2. However, the estimated incremental cost of targeting and implementing energy efficiency programs in a specific area for System Reliability is provided in several tables in Attachment 5 for informational purposes only. The request for incremental funds for SRP is being made in the separate SRP filing.

IV. Funding and Budgets

Funding, budgets, goals, and cost-effectiveness information is provided in Attachment 5 for the proposed electric energy efficiency programs and in Attachment 6 for the proposed natural gas energy efficiency programs.

A. 2017 EE Program Plan Funding Sources

The sources of funding and the amounts of the funding proposed for the cost-effective 2017 EE Programs are shown in Table E-1 for electric programs and Table G-1 for natural gas programs.

The sources of funding for the 2017 electric programs are shown in Attachment 5, Table E-1. To collect these funding sources for the 2017 cost-effective programs, the Company proposes: (1) one line on the customers' bill labeled "Energy Efficiency Charge" at $0.01124 per kWh, as calculated in Attachment 5, Table E-1 (composed of the existing energy efficiency program charge of $0.01077 per kWh plus a fully reconciling funding mechanism charge of $0.00047 per kWh in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7); (2) projected Large C&I commitments from 2016, if any; (3) projected carryover of the year-end 2016 fund balance, as applicable, including interest at the rate in effect for customer deposits; (4) forecast revenue generated by ISO-NE's Forward Capacity Market (FCM); and (5) anticipated revenues generated through RGGI permit auctions. Additional detail regarding Regional Greenhouse Gas Initiative (RGGI) funds is described below. Funding sources do not include revolving loan funds.

The sources of funding for the 2017 natural gas programs are shown in Attachment 6, Table G-1. The Company proposes that the 2017 budget should be funded from the following sources: (1) one line on the customers' bill labeled "Energy Efficiency Charge" at $0.888 per dekatherm for residential customers and $0.726 per dekatherm for non-residential customers as calculated in Attachment 6, Table G-1 (composed of the existing energy efficiency program charge of $0.748 per dekatherm minus a fully reconciling funding mechanism of $0.140 per dekatherm for residential customers and the existing energy efficiency program charge of $0.487 per dekatherm minus a fully reconciling funding mechanism of $0.239 for non-residential customers in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7); (2) projected carryovers or under-recoveries of the year-end 2016 fund balance, including interest at the

rate in effect for customer deposits; and (3) low income weatherization funding in base rates. Funding sources do not include revolving loan funds.

The 2017 budgets for cost-effective electric and natural gas efficiency investments are dependent on a number of projections that inform the amount of funding, including projections of kWh or therm sales of electricity and natural gas, year-end 2016 large C&I program commitments, capacity payments received from ISO-NE (electric only), and year-end 2016 spending. The Company estimates that the electric projected fund balance at year end 2016 will be negative $2.67 million, as shown in Attachment 5, Table E-1; the gas fund balance at year end 2016 is estimated to be negative $1.5 million, as shown in Attachment 6, Table G-1.

Other considerations regarding funding sources include:

1. ISO-NE Capacity Market Revenue

Consistent with the PUC's Standards, the EE Procurement Plan, and PUC decisions regarding energy efficiency program plans since 2008, the Company and the Parties recommend that kW-demand savings achieved via the electric energy efficiency and Combined Heat and Power programs continue to participate in the FCM as Passive On-Peak Demand Resources. The demand savings attributed to energy efficiency measures and Combined Heat and Power facilities will be reported by the Company to ISO-NE as Energy Efficiency and Distributed Generation, respectively. All revenue received from participation in the FCM will be reinvested as a funding source for energy efficiency.

The Parties fully agree that the Company should recover all prudently incurred FCM expenses from ISO-NE capacity-payment revenue generated by the demand savings from efficiency programs represented by the Company. The Company expects that capacity payments received from the ISO-NE will exceed its administrative and Measurement and Verification (M&V) compliance costs of participation in the FCM, and will result in additional funds being made available to fund efficiency programs for customers. If these participation costs exceed the capacity payments, the Parties agree that the Company may recover its prudently incurred costs from the energy efficiency program fund. The Parties reserve the right to examine the actions and expenses of the Company to ensure that only prudently incurred expenses are deducted from ISO-NE capacity payments or the energy efficiency program fund.

In addition, as part of the FCM, all qualified auction participants are required to post Financial Assurance to provide security that the promised resource will deliver the promised MW at the promised time. If, as a result of circumstances

beyond the Company's control,[18] the Company is unable to provide all or a portion of the megawatts of capacity proposed in its qualification packages and capacity auction bids, some or all of the financial assurance monies would be forfeited.

2. Regional Greenhouse Gas Initiative, Inc. Funds

The Plan includes proceeds from the auction of Regional Greenhouse Gas Initiative (RGGI) allowances pursuant to R.I. Gen. Laws §23-82.6 and consistent with the 2016-B Plan for the Allocation and Distribution of RGGI Auction Proceeds.[19] The Company has included $2.0 million in Attachment 5 Table E-1. The company has also provided a table illustrating Historic and Planned RGGI Proceeds in Attachment 5, Table E-11. The parties agree that the funds will be used to support the portfolio of energy efficiency services, thereby reducing the energy efficiency charge from what it otherwise would have been.

3. Exceptions to the Natural Gas Energy Efficiency Program Charge

All natural gas used for distributed generation projects approved since 2014 will be subject to the gas energy efficiency surcharge.[20]

The 2006 Act allows the PUC to exempt natural gas used for manufacturing processes from the energy efficiency surcharge where the customer has established a self-directed program to invest in and achieve best effective energy efficiency in accordance with a plan approved by the PUC and subject to periodic review and approval by the PUC. Consistent with prior PUC decisions, the Parties have developed recommendations for a process under which a manufacturer may submit its self-directed program and the required annual reports for approval. The Parties recognize that this process may need to be reviewed and modified after the PUC has accumulated sufficient experience with these programs. Any customer that receives this exemption from the natural gas energy efficiency program charge will not be eligible to receive energy efficiency program services.

[18] Such circumstances may include legislative action to alter the EE charge or discontinue the Company's authority to implement the energy efficiency programs underlying the Qualifications Package or a PUC decision limiting the Company's role in bidding the demand savings acquired through program efforts into the FCM.

[19] The Plan is available at: http://www.energy.ri.gov/rggi/

[20] Natural gas used for distributed generation (excluding natural gas used by emergency generators) for distributed generation projects approved under the energy efficiency programs in 2013 and prior years - independent of the date those facilities become commercially operable – are not subject to the energy efficiency surcharge when natural gas used for that purpose can be clearly identified through uniquely metered use and when so requested in writing by the customer.

B. Budgets

The Parties agree that the portfolio of energy efficiency programs and services for 2017 will have an overall budget of approximately $94.6 million for electric programs and $29.7 million for natural gas programs. The Parties agree to segment the budget into three sectors: residential income eligible, residential non-income eligible, and commercial and industrial (C&I). Proposed sector and program budgets are provided in Attachment 5, Table E-2 and Attachment 6, Table G-2. The derivations of the spending budget and implementation expenses are illustrated in Attachment 5, Table E-3 and Attachment 6, Table G-3. A comparison of these proposed budgets to the 2016 budget is provided in Attachment 5, Table E-4 and Attachment 6, Table G-4.

The Parties agree that the Company should make every attempt to spend or commit all the funds available for energy efficiency during the program year, including any increases in the fund balance due to increased sales or other factors. Although this Plan includes a projection of the fund balance expected at year end 2016 as a funding source (or deficit) to carry into 2017, it is likely that the actual year end 2016 fund balance will be more or less than that amount. Within 30 days after the filing of the 2016 Year End Report, the Company will calculate the difference between the actual year end fund balance and the projected year end fund balance included in this Plan, and will notify and consult with the Collaborative and Division regarding its intended use of the excess funds, if any. Such uses may include moving the excess funds into financing mechanisms for the sectors in which the excess occurs, supporting possible overspending during the year, reducing the energy efficiency program charge, or carrying the excess funds over into the next program year. After consensus approval by the Collaborative, the Company will notify the PUC and the EERMC of the actual year-end 2016 fund balance and the intended use for the disposition of the funds. If the use of the funds supports overspending of current year program budgets, then, in addition to the above requirements, the Company will follow the provisions for overspending in Section D, below. Use of excess funds for financing mechanisms will not be considered as overspending.

The Parties also agree to review the status of budgets regularly to assess whether they are likely to come to a successful completion. If not, the Parties agree to review the advisability of transferring funds to other programs where the money could be more effectively used. Fund transfer guidelines are presented in Section C, below.

The Company proposes to continue the practice of funding commitments that were established in the 2014 Plan, Docket 4451. Namely, the Company will continue to make commitments for projects with a projected incentive in excess

of $3 million.[21] For all other projects, except those with incentives greater than $3 million, there would be no commitment budget and the Company will fund and pay all incentives in the year in which they are completed.

C. Transferring of Funds

The Parties will regularly review the amount of funds needed and available for each program (as well as any changes to the overall fund balance, as discussed in Section III.A above) and will transfer monies as needed. The Parties propose to use the same methodology as was used in 2016 for the transfer of funds from one program to another, or from one sector to another. Transfers during the program year may occur as follows:

1. Transfers within a Sector:
   - A. For transfers of less than 10% of the originating program's budget, the Company can transfer funds from one program to another program within the same sector without prior approval of the Division. However, the Company shall provide a summary of such transfers to the Division and EERMC quarterly.
   - B. For transfers of 10% or more of the originating program's budget, the Company can transfer funds from one program to another program within the same sector with prior approval of the Division. Upon seeking such approval from the Division, the Company shall simultaneously notify the EERMC.
   - C. For transfers in the C&I Sector between large C&I programs and small business programs of more than 5% of the originating program's budget, Division approval is required. Upon seeking such approval from the Division the Company shall simultaneously notify the EERMC. In addition, if a transfer reduces the originating program's budget by more than 20% in aggregate over the course of the program year, the transfer will require PUC approval as well with weight given to the EERMC's recommendation to the PUC on the issue.
   - D. For all transfers within a sector, the Company will reflect changes in the quarterly report(s) following the transfer and the year-end report.

[21] As noted below in Section D, the Company will be required to notify the PUC of all incentive offers in excess of $3 million. Such notifications will also include a description of how the Company intends to fund the incentive.

2. Transfers between Sectors. The Company can transfer funds from one sector to another sector with prior approval of the Division and the EERMC (or its appointed representatives). If a transfer reduces the originating sector's budget by more than 20% in aggregate over the course of the program year, the transfer will also require PUC approval. For all transfers between sectors, the Company will reflect changes in the quarterly report(s) following the transfer and the year-end report.

3. Transfers among residential retrofit programs. The Company can transfer among EnergyWise, EnergyWise Multifamily, Income Eligible Multifamily, and C&I Multifamily (which are in different sectors) programs in order to achieve the overall savings goals of all programs. Although these are listed as separate lines in the program tables, they are essentially one program from an implementation standpoint. For all transfers between residential retrofit programs, the Company will reflect changes in the quarterly report(s) following the transfer and the year-end report.

4. For transfers requiring Division and/or EERMC, but not PUC approval, the Parties will inform the PUC of the transfers, both between sectors and within sectors, in a timely fashion.

5. The Company will not be permitted to adjust its goals or incentive target calculations as a result of any transfers between sector budgets. However, after any budget transfers between sectors are made, the sector spending budgets will be recalculated for the purposes of the shareholder incentive calculation.

D. Budget Management

By November 1, 2017, the Company shall file an Energy Efficiency Program Plan for 2018. It is possible that there could be deviations from the planned budget for 2017 that could occur during the program year. Three scenarios are contemplated and it is agreed that they will be addressed as follows:

(1) The Company's expenditures and commitments for 2017 may exceed the total budget by up to 10% so long as a written explanation is provided to the EERMC and the PUC for any deviation and the expenditures and commitments are reasonably consistent with the original 2017 plan.

(2) The Company agrees that, during 2017, if the Company anticipates that continued operation of its programs is likely to result in actual expenditures and commitments exceeding the total budget by more than 10%, the Company will seek a vote of approval from the EERMC at its next meeting. Following EERMC

action, the Company will be required to obtain approval from the PUC for expenditures in excess of 10% higher than the total budget, which would be collected through reconciliation in the next year's Energy Efficiency Program Charge.

(3) If the Company did not anticipate during the program year that its actual expenditures and commitments would exceed the total budget by more than 10%, but actual expenditures and commitments do exceed such threshold, the Company will bear the burden of demonstrating the reasonableness of its actions, including an explanation of why the over-spending occurred and how the expenditures and commitments are reasonably consistent with the original plan. Such demonstration would be required to be part of the 2017 Year End Report, if not sooner.

In each of these three instances, the PUC retains its traditional ratemaking authority to review the prudency and reasonableness of the Company's actions.

In addition, the Company will file a written notification with the PUC of any energy efficiency incentive offer in excess of $3 million. The project, the incentive, and any other related proposals will be authorized to proceed after thirty days from the notice filing unless the PUC suspends the filing and/or issues an order within such 30-day period to extend the time for purposes of further review.

If the dollar value of a proposed incentive for a single project is such that it would cause a program to exceed the overall energy efficiency plan budget for the current program year, the Company will follow the provisions related to overspending, per the rules established above.

V. Goals and Cost-Effectiveness

The Company has projected cost-effectiveness for the proposed 2017 programs using the Total Resource Cost (TRC) Test. The use of the TRC Test was required by the Standards, as established in 2008 and revised by the EERMC, as approved by the PUC at the Open Meeting on June 10, 2014 in Docket 4443. The TRC Test requires that the total lifetime savings from the efficiency measures will exceed the total costs of the measures (i.e., program and customers' costs).

As provided for under the Standards, benefits include primary fuel energy savings (electricity and natural gas), the value of other resource (fuel and water) benefits, price effects, and non-energy impacts (NEIs). In accordance with the revised Standards in 2014, the TRC test includes the costs associated with reasonably anticipated future federal greenhouse gas regulations. Costs include all projects costs, as well as program planning and administration, sales, technical assistance and training, and evaluation. To

illustrate the detailed components of the TRC as well as the sources of the values, the Company has provided Attachment 4.

Two key supporting documents for cost effectiveness are the Technical Reference Manual and the Avoided Cost Study. For the 2017 EE Program Plan, the Company developed the 2017 Rhode Island Technical Reference Manual (TRM), which documents the savings or savings algorithms and costs for measures proposed to be offered through its programs in 2017. The TRM identifies the sources for the savings estimates: evaluation studies, engineering analyses, and/or other research. This TRM is a public document and was provided to the EERMC and its consultants to support and facilitate the determination of the Plan's cost-effectiveness. It will be available at https://www.nationalgridus.com/EnergyEfficiencyReports.asp. The TRM is reviewed and updated annually to reflect changes in technology, baselines, and evaluation results.

The cost-effectiveness analyses of the proposed programs use avoided energy supply costs that were developed by Tabors, Caramanis, and Rudkevich (TCR) as part of the Avoided Cost Study, "Avoided Energy Supply Costs in New England: 2015 Report," that was sponsored by all the electric and gas efficiency program administrators in New England and was designed to be used for cost effectiveness screening in 2016 through 2018.[22] The avoided costs reflect current and expected market conditions and are highly influenced by the cost of fossil fuels and expectations about ISO-NE's emerging forward capacity market. Company-specific transmission and distribution capacity values are also included. The avoided costs from the report used for 2017 are shown in Attachment 5, Table E-8 and Attachment 6, Table G-8. There were several noted changes to the avoided costs in the 2015 study. The study forecasted lower Demand DRIPE values than in the previous study due to the fact that the ISO-NE market has reached equilibrium. The second major change was the study forecasts a lower cost for gas, which affects the avoided costs of both gas and electricity. This is due to the fact that the commodity price of gas decreased due to increased supply being extracted from the Marcellus shale region. Lastly, the Company is assuming that a lower percentage of the distribution investments associated with load growth can be deferrable through energy efficiency. Due to these factors the avoided costs benefits have decreased in 2017.

Attachment 5, Table E-5 and Attachment 6, Table G-5 provide the calculations of 2017 program year cost-effectiveness. Attachment 5, Table E-6 and Attachment 6, Table G-6 show the energy savings goals based on the proposed budgets. Attachment 5, Table E-7 and Attachment 6, Table G-7 show a comparison of the goals with the approved

[22] The report is available online at: http://ma-eeac.org/wordpress/wp-content/uploads/2015-Regional-Avoided-Cost-Study-Report1.pdf. This study forecasts avoided costs for three years, compared to prior studies which developed avoided costs applicable to a two-year period. Rhode Island and three other states have opted to have one update during the three year study period. The update will be completed in late 2016, to allow for the consideration of the latest information on regional clean power projects, and will be used in National Grid's 2018 annual and 2018-2020 three-year plans.

program goals from 2016. Attachment 5, Table E-5 shows that the proposed portfolio of electric programs is expected to have a benefit/cost ratio of 2.00, which means that approximately $2.00 in benefits is expected to be created for each $1 invested in the programs. Attachment 6, Table G-5 shows that the proposed portfolio of gas programs is expected to have a benefit/cost ratio of 1.63, which means that $1.63 in benefits is expected to be created for each $1 invested in the programs. This increase in efficiency investment continues the progress of acquiring all energy efficiency resources that are cost-effective and lower cost than supply.

VI. Bill Impacts

In addition to energy efficiency being a cost effective investment for Rhode Island, an analysis of bill impacts from the proposed investment in energy efficiency indicates that the average Rhode Islander who participates in the electric programs will realize a bill reduction of 2.0% to 35.4%, depending on rate class. The participant in the gas programs will see a bill reduction of 0.85% to 8.47%, depending on rate class. The average Rhode Island consumer (blending participants and non-participants) will see reduced bills of 0.16% to 3.44%, for electricity over the lifetime of the installed energy efficiency measures, compared to no investment. For gas bills, the average Rhode Island consumer will see 0.02% to 1.49% reduction, depending on rate class. The bill impacts analysis uses models that were first used in the 2015 Plan and considers bill savings to participants compared to the incremental cost to all consumers of investing in energy efficiency in 2017. It also factors in that non-participants will benefit through avoided infrastructure investments as well as market effects. The full bill impacts analyses for electric and gas programs may be found in Attachment 7.

VII. Measurement and Verification Plan

To verify the impacts that programs are having on energy savings, the Company hires independent consulting firms to regularly conduct program evaluations as part of its measurement and verification process. These evaluations include engineering analysis, metering analysis, billing analysis, site visits, surveys, and market studies to realize the actual energy savings that particular measures are having. Every year, the results of the surveys are used to update the TRC test calculations during planning. Attachment 3 lists the evaluations that have occurred since 2007, that are still being used, and their influence on program planning.[23] The executive summaries of recently completed evaluations are submitted electronically to the PUC; executive summaries of evaluations completed in prior years are available in the dockets for previous years, or upon request.

[23] The information in the Attachment is also intended to meet the specific requirement from the 2016 EE Program Plan to provide "a summary of evaluation results obtained since October 1, 2015, together with an attachment summarizing the impact of those results in planning the Company's 2017 programs."

Additionally, the M&V Plan for 2017 is presented in Attachment 3, and includes brief descriptions of each of the proposed studies. The areas proposed for study in 2017 have been chosen based on a number of factors: the relative amount of savings in that program or end use, the vintage of the most recent evaluation study, the relative precision of the recent evaluation study, and the available evaluation budget. In addition, some new program areas are designated for both impact and process evaluations. This list may be added to as the year progresses and different evaluation priorities are identified. In particular, the parties will consider the value of using evaluations from other jurisdictions as well as adding Rhode Island-specific impact or process evaluations, as appropriate, that will help inform the Company's efforts towards achieving the goals of least cost procurement.

VIII. Reporting Obligations

1. During 2017, the Company will provide quarterly reports to the EERMC, the Division, the Collaborative, and the PUC on the most currently available program performance for both natural gas and electric efficiency programs. These reports will include a comparison of budgets and goals by program to actual expenses and savings on a year-to-date basis, and a status report on the C&I revolving loan funds. The reports will also include a brief summary of program progress and will highlight issues by sector for EERMC, Division, and Collaborative attention. Within the C&I sector, there will be separate highlighting of large and small customer program progress and issues. Beginning in the second quarter, the quarterly reports also include a forecast of expected results.
2. During 2017, for months for which quarterly reports are not produced, the Company will provide to the EERMC, the Division, and the Collaborative monthly summaries of year-to-date spending and savings and results by sector.
3. The Company will provide to the Parties and file with the PUC its 2017 Year-End Report no later than May 1, 2018. This report will include achieved natural gas and electric energy savings in 2017 and earned incentives for 2017.
4. The Company will provide the Parties with a summary of evaluation results obtained since October 1, 2016, including a description of the impact of those results in planning the Company's 2018 programs, in the 2018 Plan to be filed by November 1, 2017.

IX. Incentive

Consistent with the Three-Year Plan, the proposed shareholder incentive mechanism for 2017 will be based on the same metric applicable to the 2016 Plan, with one modification proposed for 2017, as described below. Under the current incentive structure, the Company can earn a target based-incentive rate equal to 5.0% of the

eligible spending budget in a program year for achieving electric and gas energy savings goals.

However, in order to also promote the achievement of demand savings goals, the Company proposes to set aside 30% of the current incentive rate for achieving MW savings goals. This would allow the Company to earn a target-based incentive rate equal to 3.5% of the eligible annual spending budget for achieving MWh savings goals and 1.5% of the annual spending budget for achieving MW savings goals.

For gas, where there is no demand savings component, the Company proposes to maintain a target-based incentive rate equal to 5.0% of the eligible annual spending budget for achieving MMBtu savings goals. The proposed incentive structure would not increase the incentive rate; it only distributes the current rate across energy and demand savings.

The mechanism for calculating how much of the above target incentive the Company can earn will remain the same as in 2016 and will be applied to both energy and demand savings. As in 2015, the proposed incentive mechanism establishes an incentive of 1.25% of the annual spending budget for achieving 75% of the savings goals in a sector. This would increase linearly to 5% of the annual spending budget for achieving 100% and increase linearly from that point to 6.25% of the annual spending budget for achieving 125% of the savings goals.

Expressed mathematically, the shareholder incentive would be calculated as follows for both energy and demand savings, where SB is the Annual Spending Budget in the sector:

- From 75% of savings to 100% of savings:
    - Incentive = SB x (0.15 x % of savings achieved – 0.10)
        - x 0.7 for electric energy savings
        - x 0.3 for electric demand savings
        - x 1.0 for natural gas savings
- From 100% of savings to 125% of savings:
    - Incentive = SB x (0.05 x % of savings achieved)

The Company believes this structure will incent the Company to achieve savings that approach or exceed 100% of the annual goals. It does so by setting the threshold for savings required to earn an incentive at 75% of the annual savings goals, by creating a steep slope to earn a greater incentive in the range of 75% of savings to 100% of savings, by establishing the target incentive at 5.0% of the annual spending budget, and by offering a higher incentive for exceeding 100% of the annual goals.

The threshold performance level for energy savings by sector will be set at 75% of the annual energy and demand savings goal for the sector. The Company must attain at least this threshold level of savings in the sector before it can earn an incentive. The Company will have the ability to earn an incentive for each MWh, MW or MMBtu saved,

once threshold savings for the sector are achieved. The cap for the target incentive amount of energy savings will remain at 125%.

The ability to earn up to 125% of the target incentive is worthwhile because Rhode Island customers will realize additional energy and cost savings if the Company achieves a high level of energy savings performance. Given budget control requirements, this feature will provide the Company with an incentive to improve the efficiency of its program implementation efforts while providing Rhode Island customers with value in excess of the incremental incentive that may be earned by the Company. That is, the Company will have an incentive to increase customers' savings and customers will realize an overwhelming majority of the savings.

The savings goals are based on a set of assumptions of savings per measure and other impact factors in each program as well as the proposed budget. The determination of achieved savings will be based on the same set of savings and impact assumptions as is used to develop the savings goal in this EE Program Plan. These assumptions have been reviewed and accepted by the Parties.

Attachment 5, Tables E-3 and Attachment 6, Table G-3 provide the derivations of the eligible electric spending budget that are used to determine the incentive amounts that the Company may earn if it is successful in achieving its goals for energy savings. Attachment 5, Table E-9 and Attachment 6, Table G-9 provide a summary of the incentives related to annual energy-savings goals by sector. These goals by sector reflect the expected cost of savings in each sector informed by evaluation studies, and these goals have been adjusted to take into account changing rebate policies and the changing market being served. As described above, these goals have been carefully reviewed by the Collaborative and EERMC representatives to ensure that they represent reasonable and challenging goals for the year.

For electric energy efficiency programs, the proposed target base-incentive rate in 2017 is equal to 5.0% of the eligible spending budget for 2017. The projected electric eligible spending budget for 2017 is approximately $88.5 million (see Attachment 5, Table E-3). The total electric target incentive for 2017 is 5.0% of the proposed spending budget, or approximately $4.4 million (see Attachment 5, Table E-9).

For natural gas efficiency programs, the proposed target base incentive is equal to 5.0% of the eligible budget. The projected natural gas eligible spending budget for 2017 is approximately $27.7 million (see Attachment 6, Table G-3). The total natural gas target incentive for 2017 is 5.0% of the proposed spending budget, or approximately $ 1.38 million (see Attachment 6, Table G-9).

In addition, in order to promote cost efficiency in spending in the achievement of the energy savings goals, an adjustment will be made under certain circumstances to MWh and MMBtu savings goals in the shareholder incentive calculation. If the actual implementation expenses in a sector at year end are less than the planned

implementation expenses for that sector by more than five percent, and if achieved savings in the sector exceed 100% of the target savings goal, the savings goal for that sector will be adjusted by the ratio of actual implementation expenses to the planned implementation expenses. Conversely, if the actual implementation expenses[24] in a sector at year end are greater than the planned implementation expenses by more than five percent, and if achieved savings in the sector are less than 100% of the target savings goal, the savings goal for that sector will be adjusted by the ratio of actual implementation expenses to the planned implementation expenses.

Modification for 2017: The Company proposes one modification for 2017 as follows:

1. Finance. The granting of program funds to RIIB is intended to spur the financing of energy efficiency projects that would not otherwise occur. This is a use of program funds to achieve savings targets. Therefore, in 2017 the Company proposes to no longer exclude investment of energy efficiency funds from the calculation of the spending budget. Funds that revolve back into revolving loan funds, as well as finance funds received from outside sources, if any, such as RGGI, will continue to be excluded from the spending budget.

The Company will report final program results and earned incentive in its Year-End Report regarding 2017 Energy Efficiency Program efforts.

X. Miscellaneous Provisions

A. Other than as expressly stated herein, this Settlement establishes no principles and shall not be deemed to foreclose any party from making any contention in any future proceeding or investigation before the PUC.

B. This Settlement is the product of settlement negotiations. The content of those negotiations is privileged and all offers of settlement shall be without prejudice to the position of any party.

C. Other than as expressly stated herein, the approval of this Settlement by the PUC shall not in any way constitute a determination as to the merits of any issue in any other PUC proceeding.

D. The Parties agree that the Collaborative shall meet no less than six times in 2017 to review the status and performance of the Company's 2017 energy efficiency programs and advise the Company on potential energy efficiency programs for 2017.

The Parties respectfully request that the PUC approve this Stipulation and Settlement as a final resolution of all issues in this proceeding.

[24] Expenses related to overspending for deliverable fuels will be excluded from implementation expenses in this calculation.

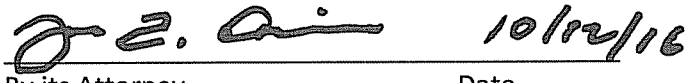
Respectfully submitted,
THE NARRAGANSETT ELECTRIC COMPANY D/B/A NATIONAL GRID

10/13/2016

_____

By its Attorney, Date
Raquel J. Webster

RHODE ISLAND DIVISION OF PUBLIC UTILITIES AND CARRIERS



By its Attorney, Date
Jon Hagopian

ACADIA CENTER

Abigail Anthony

By its Rhode Island Director, Date
Abigail Anthony

THE RHODE ISLAND ENERGY EFFICIENCY AND RESOURCES MANAGEMENT COUNCIL

By its Attorney, Date: October 11, 2016
Marisa Desautel

PEOPLE'S POWER & LIGHT

10/11/16

By its Executive Director, Date
Larry Chretien

OFFICE OF ENERGY RESOURCES

10/6/16

By its Commissioner, Date
Carol Grant

TEC-RI

10/4/16

By its Executive Director, Date
Douglas W. Gablinske

EMERALD CITIES – RHODE ISLAND

By its Director,
Brigid Ryan

10/11/16
Date

ATTACHMENT 1

2017 Residential Energy Efficiency Solutions

As advances in technology change the energy landscape, the Company strives to connect people, places and energy in meaningful new ways – changing how we live, work and play. The Company's 2017 Residential portfolio reflects changes in the marketplace and responds to how customers seek innovation and cost savings.

Rhode Island's Residential Energy efficiency solutions are delivered through two pathways, either directly in the customer's home or by partnering with retail and wholesale channels that sell energy efficient products directly to consumers and contractors. The combination of these channels provides easily accessible energy efficiency solutions to all Rhode Island residential customers.

National Grid is proud of tying for first with Massachusetts in Utility sector energy efficiency programs and policies in the 2015 ACEEE State Energy Efficiency Scorecard. In the third year of the 2015 – 2017 three-year energy efficiency planning cycle, the Residential offerings will build on prior successes and provide exceptional customer programs and innovation. National Grid will accomplish the 2017 goals by continuing to support the themes of the three-year plan. These themes are:

- Promoting cost-efficiency
- Empowering communities and markets to embrace energy efficiency
- Innovating to capture untapped savings
- Developing opportunities for system-level savings and integration

Highlights of 2016 successes to date are described below.

The Company celebrated five new RI Energy Champions – Providence, Narragansett, Charlestown, Tiverton and Little Compton through the Rhode Island Energy Challenge: Find Your Four! initiative. This initiative was also awarded the Environmental Protection Agency's (EPA) 2016 Clean Air Excellence Award for Outstanding Community Outreach/Education program.

The Company collaborated with the Rhode Island Office of Energy Resources to align energy efficiency incentives with the Renewable Energy Growth (RE Growth) statute 39-26.6-19 that allows the Company to request up to half of the Small and Medium classes of solar be allocated to an energy efficiency/Solar coordinated program in a given year. The energy efficiency/solar coordinated program, "SolarWise", established high energy efficiency, achieved through participation in the 2016 RI Energy Efficiency Program Plan, as the eligibility criteria to receive a bonus solar incentive on top of the standard RE Growth ceiling price for solar incentives.

Alignment of incentives can help to streamline the delivery of energy efficiency services and incentives.

The Company also worked with the State to promote Solarize Rhode Island to residential customers in seven communities in 2015. Customers received Energy*Wise* Home Energy Assessments in a manner that facilitated their solar installation and customers within those communities were educated about the program during an energy assessment.

Below is a summary of how the residential text section is organized.

1. Whole House Programs
2. Behavior and Products Programs
3. Initiatives
4. Residential Demonstration and R&D
5. Marketing

Whole House Programs

Energy*Wise* Single Family (Electric and Gas)

Energy*Wise* is the gateway in-home program for all Rhode Islanders in single family residences that are not eligible for Income Eligible services.[1] By sending energy efficiency auditors directly to the home, customers receive personalized education about making their home more energy efficient while receiving instant energy savings products that are installed during the visit. The education component is critical in connecting the customer with all available energy saving opportunities offered in the state. With more knowledge about their residence and an energy action plan in hand for additional improvements, a customer is better prepared to make energy investment decisions. Forecasts for the 2017 program year for Energy*Wise* will be that the program will serve 9,000 customers. Since 2009, over 50,000 households have benefitted from Energy*Wise* home energy assessments, more than 10% of all residential customers. In 2016, the program was awarded the ENERGY STAR Partner of the Year award for Program Implementation of the 2015 program year.

By embodying the themes of the three-year plan, Energy*Wise* can make a meaningful impact for Rhode Islanders and the community by reducing energy consumption while improving a resident's comfort level. The planning for **enhanced cost-efficiency** began in 2014 with Energy*Wise* and the Income Eligible Services program entering into a competitive pricing RFP

[1] Income eligible customers receive their assessments through Community Action Program agencies (CAPs) that specialize in combining state and federal opportunities in one visit.

with the Massachusetts Program Administrators for securing lighting products that are directly installed in customers' homes. By leveraging the volume of lighting installed between the two states, customers benefit by receiving high quality lighting at an attractive price. In 2017, the Energy*Wise* program will investigate the potential of a bulk procurement of weatherization materials since this currently accounts for nearly 50% of program costs. Results of an evaluation in 2016 have reduced Energy*Wise* savings for both the assessment component of the program and for weatherization. While this increases the cost efficiency demands on the program, the evaluation also illustrates the success of market transformation for energy efficiency. Savings dropped in the key area of lighting which is a nationwide trend due to higher efficiency standards and the quick response of manufacturers to supply cost effective lighting products.

Empowering communities and markets to embrace energy efficiency is a key result of the one-on-one communication that occurs through Energy*Wise*. In 2017, Energy*Wise* will be the gateway to partnerships with the State through the Renewable Energy Growth program (RE Growth), Solarize, SolarWise, and Residential Property Assessed Clean Energy (R-PACE) through the RI Infrastructure Bank, when the Bank is prepared to offer consumer loans. National Grid has successfully coordinated Solarize and SolarWise in 2016 to further the adoption of solar systems in Rhode Island.

Innovating to capture untapped savings will be demonstrated with continued support of the Wi-Fi thermostats deployed for demand response (DR) load curtailment which began in 2016. Customers in the DR demonstration will receive an enhanced incentive and be enrolled to participate in all DR events. Customers that choose to install Wi-Fi thermostats without the DR component will also be able to select from a variety of Wi-Fi thermostat options. The Company is also working with OER, EERMC, NEEP (Northeast Energy Efficiency Partnerships), The Rhode Island Association of Realtors, and other stakeholders to introduce home labeling through Energy*Wise* by mid-2017. Home labeling, via the creation and delivery of a scorecard, would allow new and existing homeowners an understanding of the efficiency level of their home regardless of homeowner behaviors within the home. Ideally the resulting score would be included on the Realtor Multiple Listing Service (MLS) so that people interested in purchasing a home would be able to consider energy costs as a factor in decision-making. The more consumers are educated on energy efficiency and energy usage, the better prepared they will be to make decisions that impact energy consumption and will hopefully be motivated to improve their home's energy score before selling it The Company will continue to collaborate with RE Growth on the SolarWise initiative which looks to right size solar systems after the completion of energy efficiency. SolarWise participants than receive enhanced incentives as a result of their participation in energy efficiency. The program will also complete a pilot it began in 2016 to remove pre-weatherization barriers and assess the costs and benefits. In 2016, the EnergyWise program included the ASHRAE 62.2 ventilation standard which includes mechanical

ventilation in homes that have lower airflow. Previously, some customers may not go through the effort to install the passive ventilation. Buy including the ventilation as part of the program, the pre-weatherization barrier was removed and full weatherization could be completed.

Finally, **system-level savings** will be looked at more holistically in 2017 by increasing the system benefit funding for deliverable fuel (oil and propane heating) customers. During the past few years, weatherization services to deliverable fuels customers have been supported through a combination of RGGI funds and energy efficiency program funds. In 2017, RGGI funds are not available and residential PACE funding has not yet been established. Consequently, in order to maintain level services, the Company plans to support weatherization services to deliverable fuel customers with system benefit funds and observe what the overall impact is to the customer charge.

Energy*Wise* is delivered in three steps: home energy assessments, installation, and quality assurance/quality control. The Company currently uses a Lead Vendor energy assessment model. This model is one of many approved by the Environmental Protection Agency (EPA) and Department of Energy (DOE) for the Home Performance with ENERGY STAR® national initiative. This program was recognized by ENERGY STAR as a 2016 Partner of the Year in program delivery for outstanding implementation performed during the 2015 program year. This model minimizes administrative costs, and guarantees customer equity and consistency. The Lead Vendor will be responsible for conducting energy assessments of single family homes (1 – 4 units) and coordinating all work resulting in additional energy efficiency measures offered through the program and all the central administrative functions.

Any single family, market rate customer that requests a home energy assessment is eligible for this no-cost service if their household has not received an assessment within the past three years. Auditors will visually inspect the home's major heating and water heating systems to assess the potential for cost effective upgrades. A home's insulation level is determined by verifying current attic, wall, and basement levels. The auditors will also be installing energy efficient lighting, water saving devices, and advanced power strips. Most importantly, the home owner participates in the home energy assessment and accompanies the auditor around their home to learn more about their residence and opportunities for even more efficiency. At the completion of the home energy assessment, customers receive an Energy*Wise* Action Plan that provides a road map for additional energy improvements, associated costs, and financing opportunities. The auditor also educates the customer about other efficiency opportunities, such as efficient heating and cooling systems, refrigerator recycling, efficient lighting, solar opportunities, demand response and wireless thermostats as well as financing options and the metrics used for the home energy score when it becomes available. Opportunities for incentives on these items are included in a folder of materials that remain with the customer. Income

eligible customers receive their assessments through Community Action Program agencies (CAPs) that specialize in combining state and federal opportunities in one visit.

Energy*Wise*, through the RI HEAT Loan, provides 0% interest financing to eligible single family customers to support customer adoption of energy efficiency products and services that are recommended during the assessment, as well as efficient heating and water heating systems. The HEAT Loan has one lender that works with consumers with lower credit scores so financing opportunities are available for most consumers. The program will also promote Residential Property Assessed Clean Energy (R-PACE) loans, slated for operation in Q3, 2017, for consumers interested in larger scale improvements that may not be covered by the RI HEAT Loan. Other favorable financing products that may arise will also be added if they provide value to Rhode Island customers.

During the previous four years, Energy*Wise* has had a community of Independent Insulation Contractors (IICs) providing RI customers' insulation and weatherization needs. All Energy*Wise* post-assessment work is delivered by these IICs, who are all Building Performance Institute (BPI) qualified weatherization contractors. All IICs are subcontractors to the Lead Vendor. Insulation and weatherization work will be distributed via a merit based process to the approved list of qualified contractors. IICs who bring customers to the program can also "tag" a customer thereby designating themselves as the weatherization provider after the assessment. Post-assessment work can include heating and cooling system testing and tune ups, duct sealing, air sealing, and insulation. In 2016, there were sixteen Home Performance with ENERGY STAR Century Award recipients in RI. The Century Award contractors performed 100 or more whole-home improvements during 2015. In 2017, the Energy*Wise* program has budgeted $1.3 million for deliverable fuel weatherization and deliverable fuel weatherization heat loans.

The last step in the Energy*Wise* process is the quality assurance and quality control component. All weatherization work performed by IICs is inspected by the Lead Vendor. An independent company is contracted to provide additional quality control on up to 10% of all work performed including home energy assessments and weatherization.

Multifamily (Electric and Gas)

The Rhode Island Market Rate and Income Eligible multifamily market remains a priority for the Company as it moves into the 2017 program year. It is National Grid's goal to offer a comprehensive program that is both cost effective yet thorough in treating this diverse segment of the population. The Energy*Wise* Multifamily program differs from the single-family program of the same name, in that it serves all customers, including income eligible.

Eligible Multifamily program participants are defined as the following:[2]

- Buildings with 5 or more units
- Properties consisting of four or more 1-4 unit buildings that meet both of the following requirements:
  - Are connected or neighboring to each other, or to a 5+ unit building, and
  - Are owned by the same individual or firm.

Both market-rate and income-eligible/affordable multifamily properties are subject to the above-outlined multifamily eligibility requirements for coordinated services. For the income-eligible properties, co-payments for energy efficiency services and measures may be waived.

The income-eligible multifamily sector is defined by properties that meet one of the following criteria:

- Owned by public housing authorities or community development corporations
- Receive affordable housing tax credits or any type of low-income funds/subsides from the state or federal government
- Consist of building units where a majority of customers qualify as income-eligible customers (receive utility service on the A-60 Low-Income rate and/or have a household income of less than 60% of the Area Median Income)

Incentives are available for weatherization (air sealing, insulation), heating and domestic hot water, cooling, lighting, and appliances. Furthermore, a multifamily property may be eligible for services and incentives under both residential and commercial programs. For example, a building with 20 units that is electrically sub-metered (20 residential accounts) with a commercial electric account for common areas and one commercial gas account serving a central heating/hot water system will likely qualify for incentives through Multifamily and the Commercial & Industrial Multifamily programs. While this adds a layer of complexity for the Company, it is critical that the Company maintain accounting via these various program budgets in order to ensure equity for all customers funding energy efficiency through the energy efficiency program charge. However, the customer will not encounter this complexity, and will instead receive a consolidated incentive for all efficiency work completed at the site[3].

[2] Stand-alone 1-4 unit buildings that do not meet these requirements are considered "single-family" and are served traditionally through *EnergyWise* Single Family or Income Eligible Services Single Family programs, as appropriate.

[3] For the past two years National Grid has offered a Multifamily Coordinator for RI customers looking to participate in the multifamily program. The single point of contact is considered a national best practice as many multifamily programs contain complexities that can be quite confusing for a customer, such as

While the Company executes many of the industry's best practices, the Company strives to ensure that each and every unit served is addressed to the best of its ability through National Grid's gas and electric channels and to bring the value of energy efficiency to as many ratepayers as possible. In the 2016 Energy Efficiency Plan, the Company noted that the multifamily program has seen growth in custom measures indicating that customers are including broader and deeper measures in their savings portfolio beyond traditional, prescriptive measures. In this 2017 plan, the Company proposes some changes to the program based on these learnings.

Moreover, the above program guidelines tend to cover the vast majority of circumstances where a customer seeks to participate. However, Rhode Island does have 1-3 unit scattered sites, often referred to as "triple deckers" that may fall narrowly outside the definition of "multifamily" even though it may make sense to treat them as such. While the Company makes every effort to ensure these sites are served either under the multifamily or the single family program, the Company desires to ensure that every prospective customer is being served to the very best of its ability. Therefore, in 2017 the Company will pay special attention to the frequency with which this situation arises.

Further, in 2016, the Company utilized the information generated from the 2014-2015 benchmarking effort of 438 income eligible buildings, to help target those in greatest need of treatment. The benchmarking of an additional 75 buildings was commissioned and the data gathering for those is currently underway. In 2017, the Company looks to go even deeper by utilizing this benchmarking data to identify and understand why certain HVAC and Domestic Hot Water (DHW) systems are underperforming and whether their performance can be effectively improved.

2017 Program Enhancements

Monitoring and Optimization Demonstration Project

The Company proposes for 2017 to conduct a boiler monitoring and optimization demonstration of heating and domestic hot water systems at approximately 10-15 medium to large income eligible buildings with central systems. Data collected from the 2014-2015 benchmarking effort shows that many of the buildings studied had a high potential for gas savings compared to similar buildings. This data will be used to help target the facilities with the greatest potential thus minimizing cost in the development stage of the demonstration by reducing the length of the outreach and participant recruitment process.

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different budgets, incentives, and rules. The Multifamily Coordinator role was developed to alleviate all of the stress and confusion and ensure the process is as smooth as possible for any prospective customer.

Heating Systems for Income Eligible Gas Facilities

It is becoming increasingly necessary to go deeper in every retrofit and achieve lasting, cost-effective savings. For 2017, the Company proposes including the installation of efficient heating systems (boilers, furnaces and commercial systems), for qualifying income eligible facilities, under the income eligible gas budget to offer a much needed service to National Grid's income eligible customers.[4]

Integrating the Treatment of Facilities Using Delivered Fuel

For many years, members of the RI Collaborative and other stakeholders have expressed an interest in serving delivered fuel customers. For the 2017 program year the Company is proposing to service both residential market rate and income eligible delivered fuel facilities with a set of weatherization and efficiency measures.[5] The Company has budgeted $500,000 in funding, in addition to funds allocated to weatherization of single family delivered fuel customers, to deliver these services.

Increase Condo Unit Participation

Condominiums present a unique challenge for most multifamily programs across the country. This is due to the fact that many condos have out of state ownership, are not occupied on a year-round basis, and/or lack the centralized decision making authority present at many apartments allowing access to all units. This often results in a lower percentage of a condominium complex moving forward with even "no-cost" measures. As such, for 2017 the Company will encourage condominium boards to notify residents on their own letterhead informing them of the upcoming opportunity and making the initial introduction of the Company's vendor to the owners. While the Company currently sends communication to residents via the National Grid vendor and makes its representatives available to condo board meetings, other utilities have had success utilizing the "voice" of a trusted source when sending out invitation letters.

Project Financing Opportunities

For 2017, the Company will explore the possibility of a partnership with Emerald Cities, a national nonprofit network of organizations working together to advance a sustainable environment, to bring their RENEW comprehensive multifamily retrofit program to Rhode Island. Currently in market in Seattle, WA, RENEW engages private and public funds to finance

[4] The HEAT Loan is still available for multifamily condo owners looking to take advantage of financing.
[5] Oil offering will include measures such as thermostats, showerheads, pipe wrap, insulation, air sealing and aerators.

income eligible multifamily energy efficiency projects and then partners with the utility to offer customers the convenience of On-Bill Repayment (OBR). While the Company is in early discussions, this may be pursued in 2017.

Further, Multifamily properties may take advantage of the Rhode Island Infrastructure Bank's (RIIB) Commercial Property Assessed Clean Energy (C-PACE) program where customers may obtain long-term low-cost financing for energy efficiency, clean energy and other building improvements in their privately owned businesses or non-profits.[6] The Company in 2017 will continue to promote this opportunity to its customers.

Request for Proposals (RFP) for Lead Vendor Services

In an effort to keep costs competitive and refine and enhance program design, in late 2016 the Company will release an RFP for the lead vendor role for both Market Rate and Income Eligible Energy*Wise* Multifamily. The selected vendor should be prepared to undertake this role by the summer of 2017.

Residential New Construction (Electric and Gas)

The Residential New Construction and Renovation/Rehabilitation (RNC) program is a fuel neutral program that provides comprehensive energy savings opportunities for single-family and multi-family projects for both the market rate and income eligible[7] markets. In 2015, the Program supported approximately 69% new construction projects and 31% renovation/rehabilitation projects.

Working in partnership with the owner and /or builder, the RNC program offers the following resources:

- Code compliance and technical trainings
- Energy modeling and design assistance
- In-field inspections
- HERS Rating
- Optional ENERGY STAR® Homes verification for projects seeking the EPA label
- Complimentary ENERGY STAR bulbs and WaterSense® showerheads
- Financial incentives based on energy efficiency

[6] Please see the *Affordability and Financing* section of the Commercial and Industrial Attachment to this Plan for a more in depth discussion on the Company's support of the RI C-PACE program.
[7] Customers who qualify for LIHEAP assistance or who qualify for the National Grid discount utility rates.

Technical training and financial incentives are the key components of the RNC program and are offered in a tiered structure to encourage both higher energy efficient homes and greater participation (see Tier Level table under "Delivery" section below). Through this approach, in 2016 (through August) the RNC program resulted in over 71% of homes reaching the Tier 2 level which is range of efficiency between 25% – 44% above the baseline of the average home built in RI, referred to as the User Defined Reference Home (UDRH).

In an effort to streamline the customer experience, heating, cooling and hot water equipment incentives are "packaged" in the same incentive application as the new construction building envelope. This offering provides synergies with the building design and mechanical systems to create a more efficient home, and creates confidence for the contractor that the high efficiency equipment incentives will remain available for the RNC projects throughout the year. If the incentives are not packaged, the project may or may not be able to obtain HVAC and hot water equipment incentives due to the availability of funds in the HVAC program.

As the Rhode Island building professionals continue to advance their skills and projects to meet higher energy efficiency levels, there are new opportunities to collaborate with other programs and/or organizations to implement even more cost effective savings. In 2017 there will be continued efforts aligning the RNC program with the Rhode Island ReGrowth Program, the National Grid Zero Energy Task Force and the Rhode Island Builders Association.

The RNC Program is administered through a Lead Vendor that manages the day-to-day operations of the Program. The Lead Vendor is responsible for the intake of projects, conducting training for building professionals, performing field verifications and reporting Program results to the Company.

The RNC program continues to attract new and repeat project teams as demonstrated by the program reaching approximately 48% of permits pulled in 2015 (905 permits, and 442 completed RNC projects. Note: this is not an exact comparison because projects may get a permit but may not complete in the same year). In addition, the Program results demonstrate that residential building professionals are becoming more proficient at building energy efficient homes, as indicated by the steady increase of projects that are achieve Tier 2 and Tier 3.

In 2017, the Company will continue to offer three tiers of high-performance energy efficient construction incentives for both new construction and renovation/rehabilitation projects (see table below) in addition to rebates for qualifying high efficiency heating, cooling and hot water equipment. The percentage of energy efficiency above the baseline applies only to the energy efficiency of the envelope, gas and electric heating, cooling, hot water systems and LED bulbs; it does not include any savings or offsets from photovoltaic energy.

Tier Level	2016 % More Energy Efficient Than Baseline[8]	2017 % More Energy Efficient Than Baseline[4]
Tier 1	15% - 30%	15% - 30%
Tier 2	31% - 44%	31% - 44%
Tier 3	45% or more	45% or more

No Cost Services: All tiers are offered with access to technical and Code Training (see Large Commercial and Industrial New Construction Program for details on the Code Training), advanced energy consulting and design review, a HERS (Home Energy Rating System) Index rating, third party blower door and duct blast testing, installation of high-efficiency lighting (LEDs) and efficient showerheads. Historically, the extent of no-cost offerings has served as the initial incentive to get builders into the Program as it provides a free service that can ultimately open the door to performance-based financial incentives for their company, energy savings for their clients (new homeowners), and a marketing advantage that can be used to distinguish themselves from competition.

Codes and Standards: The 2011 Baseline Study of Single-family Residential New Construction continues to serve as the baseline for the Rhode Island User Defined Reference Home. The Study shows that some homes were built to levels below the 2009 International Energy Conservation Code (IECC) and some are above. The average of the homes is the basis for the UDRH. Due to the fact that there remains a need to get all projects to meet the code, the RNC program continues to support Code trainings to educate contractors. The UDRH is expected to be updated in 2017. See the Large Commercial and Industrial New Construction Program for details for the Codes and Standards training program.

Energy Efficiency and Solar: In 2017, the Company will continue to collaborate with the Rhode Island Office of Energy Resources to align energy efficiency incentives with the Renewable Energy Growth (RE Growth) statute 39-26.6-19 that allows the Company to request up to half of the Small and Medium classes of solar be allocated to an energy efficiency/solar coordinated program in a given year. The energy efficiency/solar coordinated program, "SolarWise", established high energy efficiency, achieved through participation in the RI Energy Efficiency

[8] Projects are compared against the Rhode Island 2011 Baseline Study that informed the new construction baseline home. For renovations and rehabilitations, the baseline is the existing home plus code required improvements.

Program Plan (EEPP), as the eligibility criteria to receive a bonus solar incentive on top of the standard RE Growth ceiling price for solar incentives. Alignment of incentives could help to move the market closer to Zero-Energy Homes. This collaboration will not add any cost to the RNC program.

Competition/Challenge: In 2016, the Company launched a Zero Energy Home Challenge throughout Rhode Island. The Challenge was designed to award a zero energy home that is designed and built by a Rhode Island based project team and is a model that promotes the reality and feasibility of zero energy homes. The Challenge will be the genesis of promoting that zero energy homes are feasible and will serve as the initial marketing for the zero energy trainings that will be provided in 2017. The prize for the Challenge will include cash prizes, an award presentation at the 2017 Rhode Island Home Show, and potential media opportunities.

Zero Energy Homes: In 2016, the Company managed the Rhode Island Zero Energy Buildings Task Force to identify challenges and opportunities for zero energy buildings to become main-stream in Rhode Island.

In response to the Task Force's recommendations, in 2017 the Company will create a Proof of Concept program for Zero Energy Homes which will begin with training project teams to design and build zero energy homes. In addition, the program will develop the framework and goals for making zero energy homes a reality in Rhode Island. See the Zero Energy Homes section under the Residential Demonstration R&D Section.

Renovation/Rehabilitation/Additions: The renovation/rehabilitation offering is critical to the success of the Program. The Program offers very consistent services, compared to new housing starts, with technical and Code Training, advanced energy consulting and design review, in-field construction support, and marketing. A renovation/rehabilitation project is typically defined as when a house, or part of a house, is demolished to the studs. This level of demolition allows for high efficiency air sealing and insulation which improves the overall efficiency of the home. Examples of renovation projects include conversion of old industrial mill buildings into multifamily apartments, as well as single family renovations. Bringing these projects into the program is a priority for 2017 as they hold great savings potential for the Program and represent approximately 14% of the projects in the RNC Program.

Multi-Family High Rise: The Multifamily Initiative will continue to deliver collaborative services between the Residential New Construction Program and the Commercial and Industrial New Construction Program.

The Company expects a handful of multifamily new construction high rise projects to come through the C/I programs. Since the volume of new construction applications is not expected to be too high, they will be served through the Company's current C/I new construction programs

in coordination with the residential program. In the future, the Company may consider a dedicated multifamily new construction initiative.

Multifamily projects previously determined to be beyond the scope of RNC will now participate. Many will be served by both C&I and Residential. Examples of these projects include high rise buildings, and large properties with commercial and residential spaces. There is the potential to serve 5 – 6 of these projects in 2017, each with 100+ units.

The main goals of the 2017 RNC Program are to bring new project teams into the Program, encourage past participants to achieve deeper energy savings, and begin to create a path to make zero energy homes feasible. New strategies, items of exploration, and continuation of successful Program elements for the Program in 2017 include:

- Ensuring code compliance for all
- Increasing the percentage of renovation/rehabilitation projects that are enrolled and completed in the Program
- Awarding the Zero Energy Home Challenge at the 2017 Home Show.
- Continuing the collaboration with RI Office of Energy Resources to develop an opportunity to align energy efficiency incentives and SolarWise program incentives.
- Developing and delivering Zero Energy Home training.
- Collaborating with the RI Builders Association for the engagement and training of the RI Vocational and Technical Schools for the development of EE demonstration projects at the 2017 RI Home Show and Energy Expo.
- Delivering Program services to the mid-high rise building sector. Currently, the mechanical systems of mid-high rise buildings are served by the Company's C&I energy efficiency programs, but opportunity remains for improvement in the envelopes of mid-high rise buildings. The Company will continue to identify cross-sector integration and work to deliver the best solution for the customer.
- Developing new relationships with builders, developers, and code officials of the large renovation, and new construction projects in Rhode Island.
- The Program will continue to provide comprehensive training to exceed code requirements for energy efficiency through the Company's Energy Code Technical Support initiative (see also the Commercial section of this filing).

Income Eligible Services (Electric and Gas)

National Grid's Income Eligible Services (IES) Program provides comprehensive services to educate customers about energy efficiency, and help them to reduce their electric and heating bills and improve the thermal comfort of their home. Income Eligible Program services are

available for customers who live in 1-4 unit residences and qualify for Low Income Heating Assistance Program (LIHEAP)[9], also known as "fuel assistance," or who qualify for the National Grid discount utility rates.[10]

Program services and offerings are at no cost to the customer and include a home energy assessment, installation of energy-saving measures including insulation, air sealing, energy efficient lighting and where applicable, replacement of appliances, heating, cooling and heat pump water heaters (electric only).

The IES Program offers comprehensive energy efficiency services leveraging both ratepayer-funds and the federally-funded Weatherization Assistance Program (WAP) and Low Income Home Energy Assistance Program (LIHEAP). The services listed below are offered at no cost to the customer.

Services Provided – IES Program and WAP/LIHEAP

Income Eligible Services (IES) Program*	**Weatherization Assistance Program (WAP)***

• Conduct whole house audit/ energy efficiency evaluation
• Install weatherization measures
• Energy Assessment and customer education
  ○ Review utility bills
  ○ Measure the energy efficiency of appliances
  ○ Replace eligible appliances if they are deemed inefficient or unsafe
  ○ Replace incandescent and halogen light bulbs with LED light bulbs
  ○ Install water efficient showerheads
  ○ Install smart power-strips
• Weatherization services
• Replacement of eligible inefficient heating and cooling equipment if deemed inefficient or unsafe
	• Conduct whole house audit/ energy efficiency evaluation (not appliances)
	• Install weatherization measures (insulation, air sealing, duct sealing)
	• Replace inefficient heating equipment if deemed inefficient or unsafe
	• Improve minor health and safety issues in the home.

*Both the IES and the WAP offer all services and products at no cost to the customer.

[9] The federal government has set an income level, tied to the median income of each state, which defines the uppermost income boundary for LIHEAP participation. Individual states have some flexibility in defining income eligibility as long as it is not set above the federally defined maximum. Eligibility in this program will track the eligibility for LIHEAP set by the State of Rhode Island.

[10] These eligibility requirements are subject to change as a result of any regulatory directives, or as deemed necessary by the Company to enhance participation and/or savings.

The IES Program is administered through a Lead Vendor that manages the day-to-day operations of the Program. The Lead Vendor works directly with the seven Rhode Island territorial-based Community Action Program agencies (CAPs) which manage the intake and application processes for the Income Eligible Services Program. The seven CAPs are:

1. Blackstone Valley Community Action
2. Community Action Partnership of Providence
3. Comprehensive Community Action
4. East Bay Community Action Program
5. South County Community Action
6. Tri-Town Community Action
7. West Bay Community Action Partnership

Each of the seven CAPs plays an important role in their communities, and National Grid supports their local presence as they serve as the initial, and primary, interface for income eligible customers. Each CAP maintains an intake process for all customers that includes promotion of the IES Program and provides the Appliance Management Program (AMP) and WAP services. National Grid provides marketing collateral, videos and tools to assist the CAPs in increasing awareness of – and comfort level for – the IES Program services.

The Lead Vendor maintains consistency and quality assurance of the services among the CAPs by providing ongoing technical and best practices training for the CAPs' energy efficiency auditors and home performance professionals. The Vendor also performs field verifications and testing to verify consistency and quality of completed work.

The current model with the Lead Vendor overseeing the delivery of the Program continues to be a successful management structure, as demonstrated by the IES Program meeting or exceeding both savings and budget goals in the previous year.

Strategies to continue this success will include a continuum of offerings from 2016 as well as a enhancements to enhance the reach and consistency of the offerings. Strategies include:

- Provide collateral, video and display materials to the CAPs to build awareness of the IES Program.
- Develop marketing materials in multiple languages and appropriate reading levels to reach eligible customers.
- Regular review of geographic program participation to enhance state-wide participation.
- Conduct Quarterly Best Practices meetings with the CAPs to provide regular opportunities to learn from their peers and to promote consistent practices between CAPs.

- Conduct regular Weatherization Technical Committee meetings to provide current updates and best practices for contractors, auditors, and quality improvement/ control monitors.
- Update guidelines/best practices for the IES and AMP services to reflect changes in national and local standards.
- Identify potential opportunities for cold climate heat pumps in electrically heated homes if the technology becomes a cost-effective and approved program measure in the future.
- Collaborate with Green & Healthy Homes Initiative (GHHI) and the cross-agency Rhode Island Alliance for Healthy Homes RIAHH to provide coordinated housing interventions where applicable.
- Work with the CAPs and the Company's Multifamily Program Manager to coordinate services for eligible properties designated as multifamily. Please see the Multifamily Program section of this document for more information. All multifamily income eligible work will be served through the Multifamily program.
- Collaborate with the Rhode Island Department of Human Services (DHS) Management Team to maximize the leveraging Federal DOE and LIHEAP programs funds, match funding to capacity, and build a reliable funding stream for the CAP agencies.
- Install 100% LEDs per home.
- Continue to review the cost effectiveness of adding room dehumidifiers to the list of replacement appliances.

Behavior and Products Programs

Home Energy Reports (Electric and Gas)

The Home Energy Reports (HER) program is the Company's key program to achieve energy savings through changes in customer behavior by presenting personalized energy usage data and encouraging desired behaviors to reduce energy consumption. Globally, over 15 million homes receive Home Energy Reports from over 100 utilities serviced by the Company's vendor. Since its launch in Rhode Island in April of 2013, the HER program has helped the Company to achieve portfolio-wide savings goals while also maintaining cost efficiency. In 2015 alone, the program generated over $6.5 million in in customer bill savings.

The HER program is a statewide energy efficiency program that provides benefits for all Rhode Island customers. While over 300,000 customers receive HERs (i.e., the treatment group) by way of mail and/or e-mail, all customers have access to insights into their energy consumption via the web tools located directly on the National Grid website. From energy saving tips to an interactive online-audit that identifies areas of high usage to a neighbor comparison tool; these

options allow all Rhode Island customers to experience an important aspect of the HER program.

It is now easier than ever for a customer to take control of their energy consumption. In early 2016, the Company built the HER insights directly into the "Account Overview" page when a customer logs into their National Grid account. This new single-sign on feature has resulted in a drastic increase in customers utilizing the online HER tools. In the three months pre-integration 2,718 unique RI customers logged into these pages. In the three months after the redesign, 18,145 unique customers took advantage of these tools (i.e. a 568% increase).

Program savings are derived from sending or emailing HERs with personalized energy insights, normative messages, efficiency tips and recommendations, and promotional messages for efficiency programs in National Grid's wider portfolio. The program measures energy savings by comparing on-bill energy usage between a treatment group (customers who receive the HER) and control group (customers who do not receive the HER), using both pre and post-treatment data (i.e. A Randomized Control Trial or RCT).

Since the country's first HER programs began in 2008, there have been numerous evaluations evidencing the validity of the savings generated from these behavioral programs. Further, while customers may move forward with taking an action such as changing their lighting to LED or purchasing a new piece of efficient equipment, the simple act of receiving the report alone often creates habitual energy saving behaviors that account for the majority of savings attributed to the program. The frequency or persistence of these habitual actions, such as turning off lights or adjusting the thermostat, is directly correlated to the cadence and even medium (i.e. Print or Digital version) of the reports.

The program is administered by a Lead Vendor that developed and launched the first HERs in the country. Since 2013, the Company has employed the Lead Vendor to implement the HERs in all three of its jurisdictions (Massachusetts, New York, and Rhode Island). The Lead Vendor is responsible for maintaining HER distribution groups, crafting and delivering the HERs, tracking data, managing the Web Portal, and documenting energy savings. The Lead Vendor also works with the Company to introduce additional program enhancements throughout the year and to align with the Company's state-wide comprehensive marketing efforts.

Program Highlights for 2017 include:

HER 2.0

In November of 2016, all Rhode Island customers will be migrated to the HER 2.0 format. This new presentation of the HER will give customers a special themed paper and email report during key moments such as moving or a change in season. Also, no longer will every customer receive

the same report. In HER 2.0, the Company can now give different and more relevant experience to different groups of customers. For example, the Company can now promote income eligible programs and relevant low cost savings tips to those customers on the A-60, income eligible billing rate. Early data on the HER 2.0 digital report is showing increased open rates due to the more personalized messaging which is translating into even greater energy savings.

Seasonal Efficiency Modules

Rather than providing a static experience for customers, the Company looks to include messaging in the digital and print versions of the HERs that align with the seasons. For example, this could take the form of a "Prep for Winter" module sent to gas customers with the goal of reminding them to be aware of their thermostat settings as winter approaches. In the case of inclement winter weather, the Company could offer an "Ice Dam Prevention" module and drive customers to have their *EnergyWise* Home Energy Assessment. These seasonal campaigns have shown a clear boost to savings rates.

Non-Advanced Metering Infrastructure (AMI) High Bill Alerts

For 2017, the Company will work with the Lead Vendor to investigate integrating Non-AMI High Bill Alerts into the HER program. These alerts would be automatically delivered to customers when they are trending towards a high bill due to seasonal change. Weather-based forecast algorithms are able to predict customers' bills without AMI Data. These insights would be delivered via email on an opt-in or opt-out basis and are designed to help residential customers save energy and money when they are likely to consume more than usual for a billing period due to weather.

Rewards

Another first of its kind within the HER program, the Rewards feature helps to drive customers to become more energy efficient and earn redeemable points for every kWh of electricity saved. Points can be redeemed for modest gift cards and/or charitable donations. Since its inception in 2013, the Rewards feature has yielded verifiable energy savings and has achieved exemplary customer engagement metrics. Metrics demonstrate that the Rewards program has the highest "open rate" for all email communications, as well as "click-through" rates on all of the links provided in the email. In fact, the "open rate" and "click-through rate' are significantly above industry averages for such communications.

ENERGY STAR® Lighting (Electric)

The Residential Lighting marketplace has been a dynamic environment for the past decade as a result of federal legislation that increased the efficiency levels of residential lighting products

and the subsequent commercialization of light emitting diode (LED) by manufacturers. The LED technology, which was strongly promoted as a result of the legislations has garnered great customer acceptance. In 2017, the ENERGY STAR lighting program will no longer provide incentives for compact fluorescent lamps, the prior generation of efficient lighting. This change will allow the Company to concentrate its efforts on market transformation of the LED residential lighting market. The program will also continue its consumer education of new metrics for evaluating a light bulb including color quality, light output, and lifetime efficacy of the lamp.

The ENERGY STAR® Lighting Program has been instrumental in educating consumers on the availability of new products by supporting retailer displays showing differing lighting technologies and training retailer sales teams who work with consumers on selecting the best lighting products for their needs, while educating them on the benefits and savings associated with efficient lighting. In 2017, National Grid will be strongly promoting a new 15,000 hour lifetime lamp, which resulted from an updated ENERGY STAR specification. Awareness and education of efficient lighting is also supported through retailer and manufacturer promotions. National Grid has secured end cap displays at retail stores that keep energy efficient lighting in a prominent location in the store.

The ENERGY STAR lighting program supports the national EPA and DOE ENERGY STAR program and campaigns and leverages the education components across the state. By requiring all lighting products to be ENERGY STAR qualified, the program also ensures that products in the marketplace are a consistent quality thereby minimizing customer dissatisfaction.

Customers are able to purchase ENERGY STAR® bulbs and fixtures through buy-downs, markdowns and discounts. The program makes it affordable for customers to purchase the most cost effective, energy efficient products. The Company will continue to pursue new technologies and cost-effective lighting products to add to the portfolio. Pricing negotiations with manufacturers and retailers assist in bringing the most cost effective lighting products to market.

Program resources are leveraged between ENERGY STAR® Lighting and Residential Consumer Products to provide the customer with comprehensive, holistic offerings at reduced costs. Similar marketing channels, retailers, and vendors allow the programs to provide economies of scale.

The program is delivered at retail stores, through the online catalog, special online promotions, and in 2017, the program will test relationships with online retailers. A mobile retailer is also engaged to provide product sales at community and corporate events. Additionally, the school fundraiser program will be continued which supports schools and non-profits educate future

consumers on the benefits of energy efficiency while also providing a fundraising opportunity. In 2017, the Company will run a special bulb promotion with Operation Stand Down Rhode Island which aids veterans in securing stable housing and employment.

Residential Consumer Products (Electric)

This program supports the Environmental Protection Agency's ENERGY STAR® brand by encouraging the purchase of ENERGY STAR qualified major appliances and electronics and other efficient devices, which include, but are not limited to clothes washers, dehumidifiers, room air cleaners, clothes dryers, advanced power strips, and pool pumps. Product categories that are not currently part of the ENERGY STAR program are also considered. Recycling of refrigerators and freezers which had a vendor disruption at the end of 2015 and resumed in 2016 will also be promoted in 2017.

This program is managed and marketed in conjunction with the ENERGY STAR® Lighting program. The Company provides retailer support, training, advertising, consumer education, codes and standards review and advocacy, as well as manufacturer labeling in its efforts to promote energy efficiency consumer products.

Manufacturers build their products to meet or exceed energy efficiency performance specifications established by the ENERGY STAR® label. Together with manufacturers, local retailers, and the EPA, the Company works to help identify and promote the purchase of these high efficiency products to its customers. The Company uses a range of incentives depending on the type of product and amount of anticipated customer engagement. For large white goods, a mail-in rebate is frequently used. This process allows the customer to consider the value of purchasing a more energy efficient model given the potential of receiving a rebate after the purchase. For electronic items a mid-stream incentive is frequently used. This incentive is given to the retailer based on the sale of specific products. An upstream promotion with pool pump manufacturers began in 2016 to produce more attractive pricing for the energy efficient option.

An important part of the program is educating customers about the ENERGY STAR® label. As retail stores are an integral channel for promoting the label, the Company designs, prints, and distributes a wide variety of point-of-purchase materials and signs for display in retail stores. The Company also develops media stories and public relations opportunities about ENERGY STAR®. In addition, the Company employs an outreach vendor to put up signage, train retail staff, and help label products. The Company will continue to utilize a mobile retailer to educate consumers at community and corporate events, as well as at mall kiosks, on the benefit and proper usage of advanced power strips (APS).

High-Efficiency Heating, Cooling and Hot Water (Electric and Gas)

Since 2004, the Company has offered the High Efficiency Heating, Cooling and Hot Water Program for both gas and electric systems. The program offers incentives to encourage customers and contractors to purchase high efficiency heating, cooling and water heating equipment. In addition the Program offers incentives for quality installation verification (QIV) services that verify proper installation for the most efficient operation of the equipment. Participation in the program is attributed to two channels: contractors offering energy efficient products/incentives and customers' request for efficient equipment to reduce energy bills.

In 2013 and 2014 due to over-subscription in the Gas HVAC Program, lower efficiency products were eliminated from the product offerings, and remaining product incentives were reduced by approximately 50%. The measures and incentives provided in 2016 will remain intact in 2017 and the offering of the Boiler 90 AFUE (annual fuel utilization efficiency) and the on-demand water heater .82 EF (energy factor) will be reinstituted.

The High Efficiency Heating and Cooling Programs are administered by one Lead Vendor which supports the delivery of cost-effective and efficient implementation of the Program as well seamless service offerings for Rhode Island customers.

While the Lead Vendor is the face of the Program, contractors continue to serve as the Program's primary delivery mechanism. The Lead Vendor works closely with the contractor community to provide trainings and outreach to ensure accurate and efficient delivery of Program services to customers, while also improving contractors' skills and capabilities. In 2017 contractor outreach events will continue to cover equipment specifications, right-sizing equipment, best practices for installing, sealing, and insulating equipment to achieve optimal performance, awareness of current code requirements, and the best ways to assist customers with rebate submissions.

In 2015 an evaluation of condensing boilers discovered that systems were not correctly sized or calibrated, therefore the product lost savings effectiveness. In 2017 there will be a focus on the proper installation of the condensing boiler systems in order regain the savings once another evaluation is conducted.

The High Efficiency Heating and Cooling Program utilizes an outside rebate processing vendor which streamlines the collection, processing, and issuance of customer rebate applications, all within a timely manner. Rebates are processed via online or paper submission.

Planned strategies for 2017 include the following:

- Providing a unified customer experience through The High Efficiency Heating and Cooling Programs.
- Providing regular contractor meetings throughout the year to provide updates and training opportunities. Training topics may include best practices for installation of condensing boilers, demand response, identifying opportunities for cold climate heat pumps, etc.
- Communicating with contractors and retailers via newsletters and emails with program updates, benefits of energy efficiency and best practices.
- Reinstituting the Boiler 90 and the on-demand water heater 82 to provide energy savings opportunities to customers who do not want to purchase the higher efficiency/more expensive equipment.
- Promoting participation in the Connected Home Program that uses Wi-Fi thermostats to support demand response.
- Identifying customers to add "intelligence" to their electric hot water heater to calibrate water heating periods with hot water usage. This will be implemented through the demonstration projects described below.
- Providing upstream incentives for qualified electronically commutated motor (ECM) circulator pumps from participating distributors. Upstream incentives are a way to bring down the retail price through agreements between manufacturer and retailer.
- Continuing to monitor the potential of cold-climate heat pumps to provide additional savings opportunities for both cooling and heating. This technology is potentially a good fit for Rhode Islanders who heat with electric resistance or delivered fuels (i.e., oil, propane, etc.). If the pending MassSave program evaluation report on cold-climate heat pumps provides a compelling case to offer this product on a larger scale, and if budget allows, the product will be promoted within the 2017 Program.
- Encouraging contractors to promote the Energy*Wise* Home Energy Assessments to provide a path for customers to reduce energy load and subsequently right-size equipment.
- Collaborating with EnergyWise to conduct targeted marketing for customers who have received recommendations to upgrade/replace their current heating, cooling, hot water systems or thermostats.
- Providing the Company's Gas Conversion team with updated energy efficiency collateral. See the *Gas Conversion* section for more details.

Gas Conversion

The Company continues to receive high demand from residential customers to convert to natural gas heating options due to real or perceived cost benefits, convenience, or home improvements. In Rhode Island, the Company's Gas Sales Program is currently responding to

this market shift, allocating resources to natural gas conversions, as well as piloting new implementation strategies, such as the Rhode Island Gas Expansion Pilot Program. Natural gas conversions present a strong opportunity for energy efficiency, especially with regards to the new heating equipment that is installed. In 2017, the Company will continue coordinate between the High Efficiency Gas Program and the Gas Sales Program to promote high efficiency heating systems during the conversion process. Furthermore, the Company will utilize these conversions as opportunities to leverage its other energy efficiency offerings, such as the Energy*Wise* Home Energy Assessment and the HEAT Loan's 0% financing, to deliver even a better and more cost-effective product for the customer. This seamless integration will provide the maximum value for the customer at the time of conversion – when energy efficiency improvements make the most sense.

Initiatives

Community Initiative

Since May of 2013, the Company has delivered a robust statewide community initiative called the Rhode Island Energy Challenge: Find Your Four! (the Challenge). Designed to promote the Company's energy efficiency services and solutions by asking Rhode Islanders to pledge to be more efficient through finding four ways to save at home ('Find Your Four'), the Challenge has leveraged existing and new community relationships with entities such as municipalities, schools, faith-based groups and businesses. The Challenge organized and managed friendly 12-16 week competitions to spur participation from residents, congregation members, schools and employees by creating a 'call-to-action' for energy efficiency.

New for 2017, the Company looks to build on the success of prior years and go even deeper into the communities for greater energy savings. To begin, National Grid proposes to run Four (4) community challenges (bringing the total municipal participation to 17 of 39 Rhode Island cities and towns). These four communities will be unique, as the challenges will have more targeted "asks" than in years past. The lead vendor will now work with local leadership to run "mini campaigns" within each town's longer Challenge participation. For example, one week could be declared "Refrigerator Recycling Week" throughout the whole city. The Company will then track the increase in program participation.

Traditionally, Challenge participants have taken a pledge to find any four ways to save (via a program website) that work for their household. In 2017, National Grid will ask participants to identify the actions they are taking and follow through with communications to ensure they have moved forward in purchasing that LED light bulb or having their Energy*Wise* Home Energy Assessment.

Also new for 2017, the Company will work with the community from the outset to identify an energy saving project all will benefit from. This project will be communicated via program materials throughout the campaign. For example, the city council may pass a Resolution committing itself to the goals of the Challenge. In the Resolution, the council may acknowledge participation in the Challenge is being undertaken to not only raise awareness for energy efficiency and greenhouse gas reductions (GHG) in the community, but also to win funds to replace the lighting at the local ballpark or recreation center. Progress towards the goal will be communicated to the public at regular intervals via local press publications and when 5% of all households take the pledge the town will receive the designation of *Rhode Island Energy Champion* and the monetary grant to contribute to energy saving retrofits on the selected community building of choice.

Residential Demonstration and R&D

Communicating Water Heater Controls

The Company is proposing to offer a connected device demonstration project with a vendor that can provide a communicating water heater control device. This device will learn the hot water use behavior of the occupants and match the water heating accordingly. The majority of water heaters heat water when it is not needed, for example while occupants are sleeping or at work. There is a suggested water heating savings of 30% by some vendors for matching the heating cycles with the demand for hot water. There may also be demand response (DR) capabilities with these devices that will be assessed and may be integrated into National Grid's existing DR platforms.

The target pilot will look to install 150 units. Customers will receive a free device and installation for participating. They will benefit from energy savings, maintenance alerts, and a graphical display of hot water usage. Customers who complete the program term and have participated in all events will receive an additional incentive for participation.

This demonstration will provide an examination of the costs and benefits of communicating water heater controls. The following metrics will be measures to determine the success and impact of this demonstration: customer total bill savings for gas and electric bills as applicable, demand response load curtailment, customer satisfaction of communicating appliances, customer assessment of technology benefits, customer experience of program, and likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders.

Energy Storage

The Company would like to test residential battery storage. Existing programs leverage energy curtailment at the customer level during times of peak system load. The current DR program

utilizes communicating thermostats and will eventually offer communicating appliances. Battery storage will move DR to the next level by allowing the Company to dispatch storage systems during peak load periods and providing customers a tool to shift peak loads to less constrained periods.

This demonstration project will use a modest number of installations to test the complexity of this technology implementation. The devices will be installed by an installation vendor with the appropriate qualifications. Customers will be compensated by receiving a free device and free installation.

The demonstration will provide insight towards the costs and benefits of battery storage. There is little Company knowledge regarding the installation, building requirements, and DR platform integration for battery storage technology. The following metrics will be measured to determine the success and impact of the demonstration: demand response load relief, customer load shifting, reliability, customer assessment of technology benefits, customer experience of program, and likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders.

Emerging Lighting Controls

The Company seeks to demonstrate communicating lighting controls. These lighting controls may have advanced functions like occupancy, vacancy, and dimming for wall switch applications. There is promising savings suggested from lighting studies and a demonstration would allow real life experience of this technology before promoting it at a larger scale. In addition to energy savings, lighting controls also provide an opportunity to observe actual lighting usage in residential spaces.

National Grid would like to install this technology in up to 100 homes. This implementation will require a device vendor to provide the product and an installation vendor to install and configure the devices. Customers will receive a free device and installation for participating. They will benefit from energy savings and remote control of their devices. Customers who complete the program term and have participated in all events may receive an additional incentive for participation.

The demonstration will test the value of communicating lighting control switches and potential energy savings. The following metrics will be measures to determine the success and impact of this demonstration: customer total bill savings for electric, customer satisfaction of communicating appliances, customer assessment of technology benefits, customer experience of program, and likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders.

Connected Device Demonstration

The Company will also continue its connected device demonstration project which began in 2016. Currently the Company is controlling Wi-Fi thermostats during periods of peak load. These demand response efforts will be evaluated in 2017 and opportunities for including Wi-Fi appliances such as communicating washers, dryers, and room ACs will also be considered.

Zero Energy Homes

In 2015 the Company created a task force/advisory council that included key stakeholders in Rhode Island. These stakeholders represented many facets of the existing, and future, Zero Energy Building (ZEB) market and brought experience, entrepreneurship, and a desire for Rhode Island to lead the country in the ZEB market. The Task Force White Paper developed in 2016 (to be submitted to the Governor's office at the time of writing this plan) recommends policies, incentives, education, financing and partnerships will help to foster the growth of the residential and commercial ZEB market in Rhode Island.

The Task Force recommended that The Company pursue the development of "proof of concept" or "demonstration projects" to showcase ZEB "Ready" design, such that the rest of the energy use of the buildings can be supported by renewable energy.

The Company will convene a small working group to design the "proof of concept" plan and identify potential owners/builders who would be willing to develop a zero energy home that would be used as a source of testing design, equipment, scheduling and delivery of the project. The "proof of concept" will potentially include both a new construction project and a renovation project and will engage all parties early in the process, and no later than the design stage.

The "proof of concept"/"demonstration projects" may include a study of renewable systems and their performance, in addition to the efficiency elements. To understand post-occupancy performance of these buildings, the Company will measure the buildings' performance after they are constructed. This ongoing post construction analysis will require additional metering, data analysis, and intensive commissioning work that falls outside the scope of the Company's standard EE program.

The Company will provide technical support and incentives for high performance measures that will result in high efficiency design and technology that will result in a low energy use for the home.

New Technology

The Company is open to receiving recommendations on promising new technologies, strategies, and programs that could be tested through future demonstration efforts.

In order to provide a platform to receive suggestions and foster communication, the Company will work towards adding a suggestion box on the RI Energy Saving Programs webpage in 2017.

Marketing

Overview

The goals of the Company's marketing efforts are to build awareness, educate customers, and drive participation in the Company's efficiency offerings and services. The Company uses an integrated approach with general awareness tactics (i.e. print ads and radio) as well as digital and direct one-to-one tactics (such as e-mail and direct mail) at the program level to generate interest.

Delivery and 2016 Success

On June 1, 2016, National Grid launched a new campaign called "Life on the Grid" (LOTG) to promote energy efficiency, building on the approach started in 2015 of promoting its energy efficiency opportunities to all customers through a single cohesive energy efficiency campaign. The LOTG campaign was developed using customer insights and research and encompasses the following key principles:

- Focuses on customer benefits.
- Connects energy to customers' daily lives through storytelling.
- Appeals to customers emotional needs.
- Simplifies actions customers take.
- Resonates with all customer segments (Business on the Grid for C&I and trade).
- Begins to redefine the "grid" as the energy delivery system of the future.

The marketing and customer outreach efforts embody a simple, understandable, and storytelling messaging strategy to build awareness and interest in the Company's energy efficiency offerings and services. It does so by evoking a positive emotional response to get customers' attention. The Company's marketing and outreach efforts reach customers in the communities where they work and live and connect them to the value of energy efficiency.

Energy Efficiency familiarity scores in Rhode continue to exceed all other National Grid jurisdictions demonstrating RI's leading position, with two-thirds of RI residential customers familiar with National Grid's energy efficiency in June, 2016. Additionally, National Grid has enhanced the RI customer digital experience with an improved National Grid website, as well as adding digital assets such as native advertising and Facebook newsfeed ads and pre-roll video. In total, customers have clicked through digital ads 261,860 times from January through June 2016.

A deeper analysis of paid search results showed that top performing ad copy include "National Grid Can Help" and "Reduce Energy Costs" demonstrating customers are connecting EE solutions with National Grid. Finally, on-line social shopping sales for Energy Star Lighting and Products have continued with strong performance. Three lighting and product online shopping promotions to date in 2015 have resulted in more than 18,000 LED bulbs, advanced power strips, room air cleaners, and low flow shower heads.

In 2017, communications will continue to be relatable. National Grid will expand upon its knowledge and understanding of its customers. As in previous years, the Company will leverage customer intelligence and profiling information gained through research to deliver targeted, relevant information. Marketing will generate awareness and drive participation by communicating to customers consistently and clearly demonstrating an understanding of their unique needs.

The Company's marketing and outreach strategy will:

- Provide a clear and easy path for contacting National Grid.
- Communicate compelling and relevant messages, clearly describing the benefits of energy efficiency with customer-focused language explaining the expected benefits such as savings and rebates with the unexpected benefits such as comfort, convenience, and peace of mind.
- Deploy targeted marketing, demonstrating the understanding unique motivational differences of customer markets.
- Use diverse channels with consistent messages to reach customers and generate awareness, trust and interest.
- Ensure coordinated strategies that work together to achieve a consistent customer experience and increase knowledge and awareness of the energy efficiency offerings, ultimately leading to higher participation rates and optimized performance.

Trade allies play an important role in this work. National Grid's residential trade ally program and outreach is through a long-standing vendor who aligns homebuilders, residential contractors and other trade professionals with the Company's energy efficiency solutions, whether for new construction or HVAC. National Grid augments this vendor's reach through direct mail and digital promotion to the Company's in-house database of residential trade professionals to help increase awareness and engagement with the vendor's program. For example, over the past year the vendor sponsored and National Grid promoted 8 webinars specifically targeting RI trade allies. These webinars attracted more than 150 RI participants who contacted the Company for further information and/or support of upcoming projects. Webinar dates are being considered for 2017. The Company's series of targeted trade professional

newsletters were also updated with a new look and feel. Annual Open Reach[11] of these newsletters exceeds 40% for the RI based circulation of over 1,250.

In addition, print/digital trade advertising builds on the Life on the Grid messaging described above in ways that are directly relevant to the Trade community (Business on the Grid). The themes are built around how National Grid's energy solutions help trade allies grow their businesses by providing more value to their customers -- by bringing National Grid in early, the Company can provide energy efficiency expertise, improve building performance, and lower project costs.

The Company also recently introduced a Trade website to serve as an organizing marketing framework to deliver fast, easy access to National Grid information relevant to trade allies; the Company will continue to enhance this Trade-specific website in 2017.

National Grid continues to seek new ways to engage the Rhode Island community to build an innovative and sustainable energy future in Rhode Island. As such, the Company wants to explore the development of an interactive space where Rhode Islanders can become more engaged in learning and conversation about the future of energy and the environment. National Grid is calling this collaborative space the Sustainability Hub.

The Sustainability Hub will serve as an educational facility with interactive exhibits that highlight the successes of today's energy solutions while empowering customers to create a sustainable energy future for tomorrow. The Hub will include a large flexible meeting space to attract thought-leaders focused on energy-related issues to convene and create the future of Rhode's energy solutions.

By partnering with the State, local colleges and universities, and businesses National Grid envisions the Sustainability Hub as a multi-faceted nexus thriving with innovation, excitement and passion. The Company intends to empower students and faculty to join us by integrating their disciplines in areas such as energy, engineering, hospitality, policy, marketing and community service. By including educational partners in the development of the Sustainability Hub, National Grid will create stewards for the energy future of tomorrow.

[11] "Annual Open Reach" represents the percentage of unique recipients who opened the newsletter during the past year.

Residential Measures and Incentives

The following tables list the groups of measures offered in the residential programs, their planned quantities and incentives. Each group may be comprised of many measures.

Electric Programs			
Program	**Measure**	**Units**	**Incentive**
Residential New Construction	Code Plus Home	0	Average Incentive based on measure mix
	Dishwasher	0	
	LED Bulbs	10,250	
	Renovation Rehab CP	72	
	Refrigerator Rebate	0	
	Renovation Rehab Tier 1 Home	60	
	Renovation Rehab Tier 2 Home	2	
	Renovation Rehab Tier 3 Home	0	
	Showerheads (Elec heat)	0	
	Tier 1 Home	35	
	Tier 2 Home	17	
	Tier 3 Home	2	
ENERGY STAR® HVAC	Central Air QIV	173	$175
	Central Air SEER 16.0 EER 13	153	$250
	Central Air SEER 18.0 EER 13	100	$250
	Central Air Digital Check-up/Tune-Up	0	$175
	Down Size 1/2 Ton	20	$250
	Duct Sealing	570	$250
	ECM Furnace	0	$100
	Circulator Pump	2,000	$100
	ESQI with Duct Modifications	3	$525
	Mini Split Heat Pump QIV	27	$175
	Heat Pump Quality Installation and Verification - EnergyStar	15	$175
	Heat Pump SEER 16.0 EER 12 HSPF 8.5	28	$250
	Heat Pump SEER 18.0 HSPF 9.6	14	$250
	Mini Split HP SEER 18.0 HSPF 9	400	$250
	Mini Split HP SEER 20.0 HSPF 11	250	$500
	Central Air Digital Check-up/Tune-Up	0	$175
	Heat Pump Water Heater <55 gallon, Electric	425	$750
	WiFi Enabled Thermostat with Cooling - Oil	25	$50
	WiFi Enabled Thermostat with Cooling - Gas	500	$25
Home Energy Reports	New Mover electric	35,051	$8
	New movers dual fuel	20,676	$8
	Opt-out dual fuel	80,296	$8
	Opt-Out electric	141,395	$8

Electric Programs			
Program	**Measure**	**Units**	**Incentive**
EnergyWise Single Family	AC Timer	11	Average Incentive based on measure mix
	Aerator - Duel Fuel Only	35	
	Air Sealing Kit (Oil)	63	
	LED Bulbs	187,530	
	LED Bulbs (EISA Exempt)	13,120	
	LED Bulbs Reflectors	20,839	
	LED Fixture	0	
	LED Outdoor Fixture	0	
	Outdoor Fixtures	3,209	
	Pre-Wx	221	
	Refrig rebate	59	
	Refrigerator Brush	8,530	
	Showerhead	299	
	Smart Strip	8,929	
	Thermostat - Elec Heat only	388	
	Thermostat - Oil Only	0	
	Torchiere	23	
	Ventilation - OTHER	0	
	WiFi Thermostat	118	
	WiFi Thermostat - DR Enabled	0	
	Wx - GAS	2,250	
	Wx - OIL	600	
	Wx Elec - Elec Heat only	158	
	Pipe Insulation	27	
	Participant	9,000	
ENERGY STAR® Products	Dehumidifier Rebate	1,000	$30
	Dehumidifier Recycling	40	$30
	Energy Star Dryer	300	$50
	Freezer Recycling	500	$75
	Ladybug shower adapter electric hot water	100	$11
	Ladybug shower adapter Gas Hot Water	50	$11
	Ladybug shower adapter Oil or Propane Hot Water	10	$11
	Pool pump - 2 speed	25	$250
	Pool Pump - variable	150	$600
	Refrigerator Recycling	4,500	$63
	Refrigerator Recycling (Primary)	0	$50
	Roadrunner Showerhead Gas Hot Water	100	$15
	Roadrunner shower head electric hot water	200	$15
	Roadrunner Showerhead Oil or Propane Hot Water	20	$15
	Room Air Cleaners	500	$40
	Smart Strip	7,000	$20
	Advanced Power Strip	3,000	$35

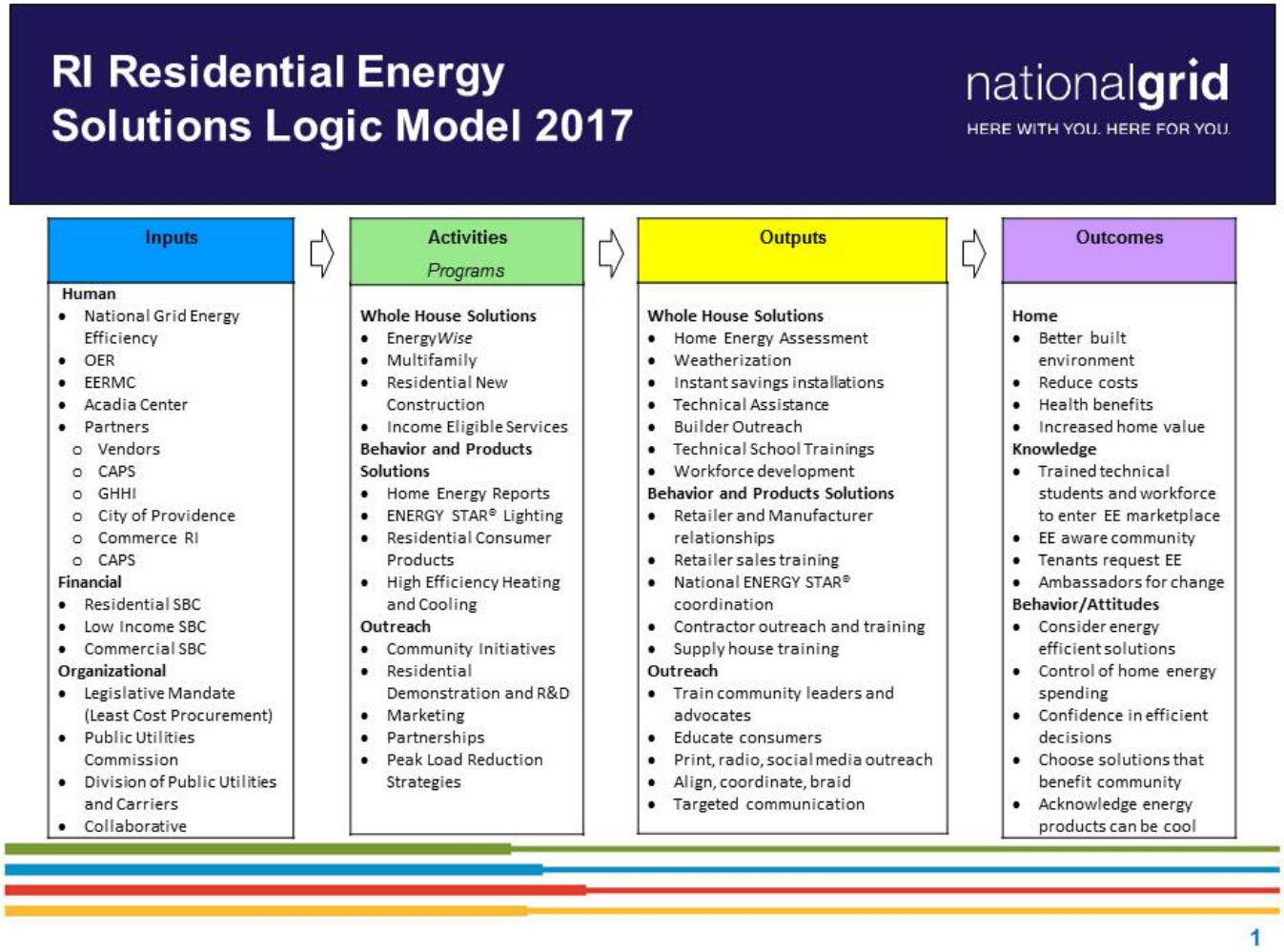
Electric Programs			
Program	**Measure**	**Units**	**Incentive**
EnergyWise Multifamily	Participant	4,000	Average Incentive based on measure mix
	Aerator	548	
	Aerator Oil	470	
	Air Sealing- Electric with AC	1,405	
	Air Sealing - Oil	150	
	Common External LED Fixture	1,401	
	Common External Reflector	209	
	Common Internal EISA Exempt	0	
	Common Internal LED Fixture	3,803	
	Common Internal Reflector	626	
	Dwelling External LED Fixture	30	
	Dwelling External Reflector	3	
	Dwelling Internal EISA Exempt	2,495	
	Dwelling Internal LED Fixture	1,449	
	Dwelling Internal Reflector	2,528	
	Heating System Retrofit-Boiler	0	
	Heating System Retrofit-Furnace	0	
	Insulation-electric with AC	1,048	
	Insulation-Oil	120	
	Pipe Wrap Domestic Hot Water- Electric	0	
	Pipe Wrap Domestic Hot Water- Oil	180	
	Pipe Wrap Heating Oil	40	
	Refrig rebate	18	
	Showerhead Elec	212	
	Showerhead Oil	193	
	Smart Strip	4,063	
	Thermostat Elec with AC	2,176	
	Thermostat Heat Pump	0	
	Thermostat-Oil	108	
	TSV Showerhead-Electric	61	
	TSV Showerhead-Oil	115	
	Common External LED Bulbs	290	
	Common Internal LED Bulbs	3,238	
	Dwelling Internal LED Bulbs	13,308	
	Custom	2	
	Vending Miser	8	
ENERGY STAR® Lighting	Hard to reach bulbs	0	$1
	LED (15,000) -Hard to reach	75,000	$8
	LED Bulb (15,000)	519,775	$5
	LED Bulb (Hard to Reach)	25,000	$10
	LED Bulbs	250,000	$6
	LED Bulbs (EISA EXEMPT)	90,000	$8
	LED Fixture	100,000	$9
	LED Outdoor Fixture	35,000	$8
	LED Reflectors	130,000	$9
	LED School Program Bulb	15,000	$8
	School Program	0	$3
	Speciality Bulbs	0	$0

Electric Programs			
Program	**Measure**	**Units**	**Incentive**
Single Family - Income Eligible Services	Window AC Replacements	300	Average Incentive based on measure mix
	Appliance Removal	7	
	Dehumidifier Rebate	0	
	DHWater Measure (elec)	8	
	DHWater Measure (gas&other)	27	
	DHWater Measure (OIL)	2	
	Participants	2,625	
	Replacement Freezer	168	
	Heat System Replacement	246	
	Heat Pump Water Heaters	0	
	LED Bulbs LI	60,697	
	Programmable Thermostat, Gas	0	
	Programmable Thermostat, Oil	0	
	Programmable Thermostat, Other	0	
	Refrig rebate	1,680	
	Smart Strip	3,191	
	Thermostats	0	
	Waterbed	0	
	Wx DelFuel	400	
	Wx Elec	18	
EnergyWise Income Eligible Multifamily Retrofit	Aerator-Electric	0	Average Incentive based on measure mix
	Aerator- Oil	314	
	Air Sealing- Electric with AC	2	
	Air Sealing- Oil	100	
	Common External LED Fixture	1,166	
	Common External Reflector	458	
	Common Internal LED Fixture	4,901	
	Common Internal Reflector	42	
	Custom	7	
	Dwelling External LED Fixture	29	
	Dwelling Internal LED Fixture	2,429	
	Heating System Retrofit-Boiler	0	
	Heating System Retrofit-Furnace	0	
	Insulation - Electric with AC	88	
	Insulation- Oil	80	
	Participant (Non-energy Benefits)	2,894	
	Pipe Wrap Domestic Hot Water- Elec	0	
	Pipe Wrap Domestic Hot Water- Oil	120	
	Pipe Wrap Heating Oil	40	
	Refrigerator Rebate	64	
	Showerhead Electric	26	
	Showerhead Oil	206	
	Smart Strip	1,767	
	Standalone Water Heater- Oil	0	
	Standalone Water Heater- Other	0	
	Tankless Water Heater- Oil	0	
	Thermostat AC Only	2	
	Thermostat Elec with AC	2	
	Thermostat Heat Pump	2	
	Thermostat Oil	201	
	TSV Showerhead Electric	182	
	Common Internal EISA Exempt	0	
	Dwelling External Reflector	20	
	Dwelling Internal EISA Exempt	1,291	
	Dwelling Internal Reflector	120	
	Common External LED Bulbs	359	
	Common Internal LED Bulbs	2,048	
	Dwelling Internal LED Bulbs	5,036	
	Vending Miser	4	

Gas Programs			
Program	**Measure**	**Units**	**Incentive**
EnergyStar® HVAC	BOILER RESET	35	$ 100
	Boiler90	350	$ 450
	Boiler95	385	$ 700
	COMBO CONDENSING	185	$ 500
	COMBO CONDENSING 95	500	$ 1,000
	COND WATER HEATER 95%MIN 75-300	15	$ 150
	Furnace95ECM	325	$ 300
	HEAT RECOVERY VENT	32	$ 250
	WATER HEATER - ON-DEMAND 82	330	$ 250
	TANK WATER HEATER 67	55	$ 100
	WATER HEATER - ON-DEMAND 94	260	$ 400
	WiFi Thermostat - cooling and htg	500	$ 25
	WiFi Thermostat - gas ht only	500	$ 50
EnergyWise	Aerator	42	Average incentive based on measure mix
	Weatherization	2,250	
	Air Sealing Kit (Gas)	900	
	Showerhead	333	
	Pipe Wrap	498	
	THERMOSTAT	2,502	
	Wi-Fi THERMOSTAT	100	
EnergyWise Multifamily	Air Sealing	3,838	Average incentive based on measure mix
	Custom Non-Lighting	25	
	Participant	4,101	
	Faucet Aerator	1,379	
	Insulation	3,192	
	Low-Flow Showerhead	587	
	Pipe Wrap (Water Heating)	504	
	Programmable Thermostat	780	
	TSV Showerhead	346	
Home Energy Reports	New movers dual fuel	20,676	$ 3
	Opt-out dual fuel	80,296	$ 3
	Opt-out gas only	31,030	$ 3
Residential New Construciton	CODES AND STANDARDS	1	Average incentive based on measure mix
	CP	60	
	CP-DHW	60	
	RR CP	60	
	RR CP-DHW	60	
	RR Tier 1	80	
	RR Tier 1 - DHW	80	
	RR Tier 2	13	
	RR Tier 2 - DHW	13	
	RR Tier 3	2	
	RR Tier 3 - DHW	2	
	SHOWERHEAD	0	
	Tier 1	82	
	Tier 1 - DHW	82	
	Tier 2	70	
	Tier 2 - DHW	70	
	Tier 3	6	
	Tier 3 - DHW	6	

Gas Programs			
Program	**Measure**	**Units**	**Incentive**
Single Family - Income Eligible	Heating System Replacement	150	Average incentive based on measure
	Weatherization	440	
Income Eligible Multifamily	Air Sealing	744	Average incentive based on measure mix
	Boiler Commercial	32	
	Boiler	15	
	Custom Non-Lighting	39	
	Faucet Aerator	2,499	
	FURNACE	15	
	Insulation	759	
	Low-Flow Showerhead	1,104	
	Participant	2,709	
	Pipe Wrap (Water Heating)	687	
	Programmable Thermostat	780	
	TSV Showerhead	288	

Appendix 1: Residential Logic Model



ATTACHMENT 2

2017 Commercial and Industrial (C&I) Energy Efficiency Programs and Initiatives

Introduction

In the Company's three year plan (2015-2017) that was approved in 2015 by the Rhode Island Public Utilities Commission (PUC), four central principles are outlined which encompass an advanced and innovative approach to serving commercial and industrial customers and the building industry at large. The Company believes that these four principles are apparent in all aspects of the 2017 Plan and incorporates the planning process, which included many brainstorming sessions from internal teams to external stakeholders and builds on the many accomplishments of the past two years. The Company is committed to delivering a successful final year to this three year cycle, all while testing technologies and program design enhancements that will benefit customers well into the future. The four guiding principles are as follows:

- **Promoting cost efficiency**: Through financing options that go beyond incentives, and other cost effective ways of delivering energy efficiency such as upstream products, code trainings, education and awareness for customers, and coordination with the Rhode Island Infrastructure Bank (RIIB) on important and innovative financing such as the Efficient Buildings Fund (EBF) and Commercial Property Assessed Clean Energy (C-PACE.

- **Empowering communities and markets to be energy efficient**: Collective energy efficiency through cities and towns, interactions and networking with vendors, suppliers and distributers to serve all sizes of customers, provide tools to customers to manage their energy usage and develop strategies and technologies based on market sectors.

- **Innovation to capture untapped savings**: Offering solid state street lighting upgrades, laying the foundation for Zero Energy Buildings, and continuing to explore and test new technologies to provide deeper savings and peak load reductions to C&I customers.

- **Developing opportunities for system level savings and integration:** These are new efforts that will consist of research and development of demand response programs for future implementation, an active outreach for Combined Heat & Power (CHP) technology, and interactions with renewable energy stakeholders to promote better integration with renewable energy.

Affordability and financing for the Company's customers are important criteria to achieve all the energy efficiency strategies and innovations that the Company is proposing in this plan. In addition to the Company's On Bill Financing, the timing in Rhode Island is right for enhancing affordability through the State's Infrastructure Bank that is further enhancing energy efficiency investments for its customers. In the 2016 plan, the Company had highlighted how its programs will work with the EBF for municipal customers. In 2017 plan, in addition to the successful collaboration between the Company's financing and EBF, the Company would like to highlight the recently launched C-PACE program through RIIB that allows for additional financing for commercial building customers.

The C&I section of the 2017 Energy Efficiency Program Plan is as follows:

The Plan begins with describing the four main distillates (titled **Central Themes** below) that are necessary to reach the Company's energy savings goals, and to deliver on the overarching themes of the 2015-2017 plan mentioned above.

- A better Customer Experience
- Market Sector Approach
- Affordability and Financing
- Education, Awareness and Trainings

Next, the C&I section divides the description and details of the Plan into three main parts, focusing on the three types of programs (Titled **C&I Energy Efficiency Programs** later in this section), and also graphically described in the appendix figures 2 and 3 of this document. In addition,

- A Large C&I New Construction program that focuses on offerings that target ground up new construction, major renovations, tenant fit-outs and end of life replacement equipment.
- A Large C&I Retrofit program that focuses on all services and technologies towards retrofits needed for existing buildings.
- A Small Business/ Direct Install (SMB/DI) program that focuses on a program that provides turn-key solutions to all small businesses.

The Appendices provide further details to the three programs mentioned above. Following figures and tables are in the appendix:

1. Sample list of custom measures for new construction and retrofit programs
2. Program logic model for retrofit program
3. Program logic model for new construction program
4. Goals and incentive description of each of the electric sub-programs

5. Goals and incentive description of gas program measures

Central Themes for Efficiency Programs

The following section describes the four broad areas mentioned previously and how they will connect with all the Commercial and Industrial (C&I) Efficiency Programs and strategies: Large Commercial New Construction, Large Commercial Retrofit and Small Business Direct Install.

Better Customer Experience & Analytics

Efficiencies in Application Processing Time

The Company is committed to provide its customers with a more efficient project enrollment and application (transactional) experience. The Company's internal Process Excellence Team has come a long way since 2014 and has made significant progress in applications process, transactions, and the building Technical Assistance (TA) review process. For example, a revised post inspection protocol is expected to reduce turnaround time after project completion thereby ensuring faster incentive payment to customers. In addition there have been reductions in cycle times from application creation to project incentive payment. In 2017, the Company will focus on improving its customer data collection through its work management system.

Data Analytics

National Grid, like many other utilities and other companies around the globe, is focused on how data can improve its decisions, inform its strategic planning, and understand its customers more completely.

The Company's Advanced Data Analytics group spent last two years gathering building level information and conducted building simulation models for small business and multifamily customers in its territory. These datasets allow much better targeted marketing in the small business and multifamily spaces and will be used by the marketing team in 2017 to better target these groups for energy efficiency. The Company will continue to examine new pathways to obtain more detailed information on its large customers.

Tools for Customers' Management of Energy Usage

The Company intends to help customers access their energy data to allow for greater awareness of energy consumption. The Company will seek to achieve this through various methods described below:

Automated Benchmarking Systems National Grid has been working diligently with internal partners to develop a path towards automating data uploads into Energy Star's Portfolio Manager. The Company acknowledges automated usage data transfer to customers as an import tool in the future for building labeling intentions, supporting prior OER commitments to support state/municipal facilities improvements, and as a tool for helping customers to better understand their energy environment. However, a high cost of integrating the Company's antiquated databases with Portfolio Manager has delayed this system from being available to customers. The Company is in the process of evaluating the costs versus the benefits that this service will provide to itself, its customers, and the State. In addition, the Company's other jurisdictions have expressed an interest in developing this similar capacity for customers to benchmark buildings through a more automated process. This shared interest may be a pathway to reduce the overall development costs for this building process thereby making automated benchmarking more affordable for Rhode Island. This potential reduction in development cost will support the Company's intentions to justify building this platform in 2017 or 2018. In the meantime, the following avenues are available for customers to get access to their building energy usage: Green Button downloads (described in the next paragraph); Manual download of usage information to select municipalities and customers on an as needed basis.

Green Button: National Grid launched the Green Button towards the end of 2014 for all its customers in Rhode Island. The Green Button initiative is an industry-led effort that responds to a White House call-to-action to provide utility customers with easy and secure access to their energy usage information in a consumer-friendly and computer-friendly format. The Green Button allows customers to securely download thirteen months of their usage data, in an XML format. Customers can then use this data to analyze their usage on their own or use third party tools to benchmark their usage. The Company is still assessing the quantities and types of customers that have downloaded green button data since its inception. Once the Company has a better understanding of these customers, it will consider targeted energy efficiency messaging to them.

Building Labeling: The Company will continue to work with the Office of Energy Resources (OER) and other stakeholders to identify strategies for building labeling in the commercial and multifamily real estate sectors in Rhode Island. Building labeling will provide greater transparency in the energy performance of a given building. This initiative, currently led by OER, is working to establish building labeling parameters and mechanisms for commercial and multifamily properties. This will likely require the linking of the Company's energy usage database with operational and asset based rating systems that property owners will use to benchmark their buildings. The Company will continue to work closely with OER to support property owner and tenant access to usage data. Benchmarking and Labeling efforts will

also help towards achieving Zero Energy Building (ZEB) goals for existing buildings as detailed in the Company's ZEB white paper (see more details in the ZEB section below).

Market Sector Approach

Specific enhancements to some sectors are highlighted below:

- Grocery/supermarkets
- Industrial/manufacturing
- Municipal & State
- Hospitality (restaurants & lodging)
- Specialty buildings like data centers, farm/agriculture and extended care facilities like nursing homes
- Hospitals
- Colleges and universities
- Commercial Real Estate
- Multifamily

Approach to Large and Mid-Sized Customers Based on Usage

The Company's sales and operations teams will continue to address unique needs of customers depending on their annual usage, peak demands and market segmentation. Customers with annual average demand of 500 kW or greater and 75,000 Therms or greater gas usage are classified as large and are managed by individual sales representatives. Since 2015, customers with annual average monthly peak demand between 200 to 500 kW and less than 75,000 Therms of gas are being served through the Channel Sales group.

Both sales teams work with customers either directly or through project expeditors and vendors and offer pathways to upgrade various systems within a facility including, but not limited to, lighting, HVAC, and compressed air. They can also call on the Company's Technical Assistance (TA) Vendors to help the customer with a more comprehensive look at their entire facility where appropriate. In many cases, this more comprehensive look helps customers uncover opportunities for savings previously unknown to them or beyond common measures.

The sections below provide details on each of the current market sectors.

Grocery Sector

The Company will continue to provide targeted energy savings opportunities to Rhode Island's grocery sector through the EnergySmart Grocer (ESG) Initiative. ESG has been in operation since 2013 and the third party contractor has been working with grocers to identify retrofit and new construction measures. The ESG initiative delivered over 6.9 million kWh and 49,000 Therms of savings in 2015 as part of its strongest year to date and reflective of several large projects which

pushed delivery well above goals for that year. ESG is showing solid delivery through June 2016 with 1.5 million kWh complete out of the 3.36 million 2016 goal. Therm savings are projected at 13,000 for 2016 and 2017, a recent increase over the initial 7,500 therm goal related to an increased focus on supermarket kitchen spaces. This initiative is expected to save another 3.36 million total kWh in 2017. The customers served by this initiative include facilities with commercial refrigeration engaged in retail food sales. They may consist of local, regional and national retail facilities that include, but are not limited to, smaller grocery stores, supermarkets, big-box stores, and pharmacies with a peak demand of 60 kW and above. ESG provides unitized incentives for the most common refrigeration measures. This gives customers an upfront and easy to understand incentive offering which leads to easier project planning and investment decisions. ESG also offers custom project engineering support to help customers pursue all cost effective measures in their facilities.

The measure mix to date includes: night covers, LED case lighting, LED shelf or end-cap lighting, adding doors to open refrigerated cases, refrigeration controls (floating head pressure control and floating suction pressure control), appropriate LED fixtures or solutions for walk-in refrigeration/freezer areas, HVAC measures, including controls and VFD's, exterior LED parking lot lighting, and EC Motors in refrigerated walk-ins and cases. ESG has delivered over 59% of its savings from refrigeration measures, 21% came from HVAC measures and 18% from lighting with the remainder coming from other areas.

ESG is considering adding a hot water heat reclaim measure to the offering and is in the process of reviewing the calculation methodology. Additional new technologies being brought forward are permanent magnet synchronous motors, an even more efficient motor than existing technologies used in fractional horsepower applications, as well as hybrid condensers that utilize evaporative pre-cooling during warmer months for more efficient refrigeration system operation. In addition, ESG will identify supermarket dishwasher demo project through its customer contacts. (highlighted in later sections under Demonstration Projects)

Over the course of the last couple of years of implementing ESG, the Company learned that marketplace understanding has grown tremendously through targeted outreach and this is reflected in the strong delivery of the initiative. The Company also learned that greater integration across other offerings like the Small Business Direct Install program could lead to better customer service and more successful projects. As a result the Company has begun to incorporate ESG services for all small grocery customers as well.

Municipal and State Buildings

The three year (2012-2015) DOE funded Public Energy Partnership (RIPEP) led to approximately 123 municipal and state buildings reaching an average of 28% projected energy reduction, way

beyond the DOE goal of the partnerships. In combination with the Efficient Building Fund (EBF) through RIIB and the Company's existing collaboration with municipal customers, the Company forecasts a continued momentum in energy efficiency in the municipal sector. In addition to incentives and technical support that will continue to be offered in 2017, in specific areas like:

Project/Energy Management Support:

In 2016, Rhode Island Infrastructure Bank's (RIIB) Efficient Buildings Fund (EBF) was created to provide capital for comprehensive projects. Qualifying projects will tend, by their very nature, to be costly and technically complex. The time and expertise required to identify, develop, and oversee these projects can be beyond the resource capacity of many towns and cities. In 2016 the Company supported several municipalities who applied for EBF applications. Support included reviewing project submittals, supporting city/town Council approvals, implementation planning, reviewing efficiency project proposals, RFP development and bidder selection.

The support for energy efficiency project implementation and street lighting that the Company and its vendor provided in 2016 has produced significant results. Municipalities have recognized the value in this type of support as it provided a trusted partner to bring the time and expertise municipalities lack to identify, develop and oversee complex projects. To continue to serve this sector, there are several support mechanisms in place for 2017:

- RIIB has hired project management support to provide auditing and project installation services to municipal customers
- URI will be supporting municipalities as they learn to use Portfolio Manager as well as meet the EBF's energy reporting and energy management plan development requirements.
- The Company will continue to support municipal engagement in OER and RIIB programs like vendor selection, engineering support and implementation of upgrades through the EE programs.
- The Company will also provide energy audits to select municipal/school/wastewater customers to support their EBF applications.

For financing in this sector, the Company will continue to offer On-Bill Repayment for electric and gas measures. The Company and other partners such as OER will assist the RIIB with municipal projects currently enrolled in the EBF program through RIIB, and on municipal projects that subscribe in 2017. The Company plans to serve on the committees in order to ensure that customers have access to finance, that the process is easy, and that the Company and RIIB are working with customers in a coordinated way.

State SEMPs: In June 2016, a joint Memorandum of Understanding (MOU) was signed between the Company, OER, Department of Administration (DOA) and Department of Capital Asset Management (DCAMM). The purpose of this three year period MOU is to strengthen the State's commitment to economic growth and climate change mitigation, and to lead by example through the Governors Executive Order (EO 15-17) that requires all State facilities to reduce their energy consumption by 10% by 2019. Consistent with this EO, this MOU is designed to integrate strategic energy planning across State facilities and to leverage the Company's programs and best practices to achieve a minimum cumulative energy savings of ten percent (10%) below fiscal year 2014 levels by the end of fiscal year 2019. This MOU pertains to building projects (both retrofits and new construction) for State facilities. Specifically in 2017, the goal of this MOU states electric reduction of 6.7 Million kWh and 200,000 Therms. These goals will be supported by scoping studies and retro commissioning along with a predetermined OBR per year for three years along with building operator trainings.

Manufacturing/Industrial

The Industrial Initiative was started in 2013 as a demonstration project and enrolled seven customers over the course of 2013 and 2014. During the demonstration phase, the initiative surpassed its goals by identifying more than 800,000 Therms and 7.5 million kWh in estimated[1] technical potential savings. In addition, this helped the Company build trusting relationships with its top industrial customers in Rhode Island.

In 2015, National Grid formalized the program and expanded outreach to include 17 large industrial/manufacturing customers. Sixteen incentive applications were created and paid for a total savings of more than 1.1 million kWh and more than 50,000 Therms.

In 2016, the Company continues to maintain the key features of the initiative (listed below) and the results, so far, have been extremely promising. Currently, National Grid has 30 customers participating in the initiative in various ways. Approximately 65 incentive applications are projected to be complete by the end of the year. The applications represent $8 million in customer projects supported by $1.5 million incentives with a potential savings of 6.8 million kWh and more than 300,000 Therms.

Current program components and highlights:

[1] Technical potential is an ideal scenario which sums all energy efficiency measures that are feasible given technological limitations. Typically, only a portion of this potential is achievable given cost-effectiveness, program design structure and customer limitations - such as scheduling and availability of capital.

- An industrial-specific technical expert team from the Company's specialty engineering partner provides support to its sales team and technical solutions to its industrial customers. These solutions include process energy related measures, management change recommendations, project management support, and other HVAC and lighting related options.
- A scoping study of the technical and energy management opportunities for the facility, at no cost to the customer. If a detailed analysis, in addition to a scoping study, is required (e.g. a detailed compressed air study), the costs of the study are shared with customers on a case by case basis.
- An incentives package that meets customer payback and financial hurdle rate criteria.
- Customer needs assessment: The sales team and the Company's engineering partner will conduct needs assessments in order to provide the best solutions for its customers. The Company recognizes that some customers may need more assistance in management of their energy, such as examining interval data anomalies and working to correct them (frequently scheduling or equipment setting errors), before implementing energy saving measures. National Grid will categorize customers based on their levels of engagement and will develop different implementation paths based on each customer's needs.
- National Grid will also provide project progress tracking and support to overcome implementation barriers.

In 2017, National Grid and its engineering partner plan to reach out to more customers as well as following up with customers who have successfully completed projects to see if more collaboration can be done.

Small Manufacturing/Industrial

The Company continues to serve small and medium industrial/manufacturing facilities through its direct install and large retrofit programs in Rhode Island. The Company also works closely with vendors and trade allies to support energy efficiency upgrades in these industrial facilities. In 2017, the Company will work towards identifying go-to market strategies for 150 to 300 kW small industrial customers as that's a market size where there is more potential in Rhode Island.

Restaurants

The Company will continue to offer energy efficiency services to its small to medium sized restaurants through the Direct Install and Large retrofit/new construction programs. In addition to this, the Company is testing out a new strategy for chain restaurants. Later in 2016, a large franchise restaurant in Rhode Island will participate in an initiative specifically designed for chains and franchises. This initiative was first tested in Massachusetts. The idea is to be able to approach a corporate office with an energy efficiency action plan that can be tailored to the needs of a particular chain. This chain of restaurants is an ideal candidate, with their 24/7

operation and large number of stores in the Rhode Island and Massachusetts area. This initiative will continue in 2017.

Lodging

Lodging facilities in Rhode Island have participated in the Company's programs in the area of lighting. However, there is potential for more savings. The Company is researching several areas that could help this segment reduce energy consumption even further. The Company is looking at things as simple as more efficient pool pumps to more complex interventions such as ozone or polymer bead laundry washing systems. There is also potential in room key controls for lighting, electronics, and HVAC that are very popular in hotels in other parts of the world. The Company currently has offerings for some of these items and needs to further investigate other options.

Specialty Buildings

1. Extended Care Facilities such as Nursing Homes/Assisted Living

The Company has, over the past couple of program years, investigated different ways to try and serve nursing homes, rehabilitation facilities, and assisted living spaces beyond simple lighting retrofits. The latest attempt included trying to share the cost of an experienced energy manager to help these customers jumpstart project development. It was not successful. The Company's investigations turned up three simple truths –

1. These facilities want to pursue energy efficiency and comfort upgrades to their facilities.
2. Nearly every one of these facilities did not have the resources to even consider a cost share of investigating energy efficiency opportunities, let alone act on them.
3. The Company did not have a tool, beyond the limited resources of National Grid's OBR to help them deal with these issues.

However, there is now Commercial Property Assessed Clean Energy (C-PACE) as a tool. C - PACE further defined in "Affordability and Financing" section below**,** allows customers access to low cost private capital for terms that greatly exceed most conventional business loans. It also allows to the customer to capitalize all costs related to the project.

This means that the Company now has a solution for the single biggest objection to moving forward with deeper and broader efficiency measures in this segment. These measures include, but are not limited to, HVAC improvements, envelope improvements, energy management systems, energy efficient laundry systems, and Combined Heat and Power (CHP).

Starting in 2016 and continuing into 2017 National Grid, the Rhode Island Infrastructure Bank (RIIB) and various parts of the RI state government, including the treasurer's office, will be working together to advance this solution in this segment.

This new financing tool and increased attention from various stakeholders will help dramatically increase the number and diversity of energy efficiency projects in this vertical.

2. Data Centers /Computer Rooms

Data Centers, smaller computer rooms and large banks of servers remain an area of interest to the Company due to their high energy consumption, energy intensity, load shape (use remains high during both summer and winter peaks).

In mid-2015, the Company began exploring a strategic partnership with a major player in the data center area that has experience in finding data centers/server banks, has engineering prowess, and has documented project management experience. National Grid is of the opinion that this company has the trifecta of skills and experience needed to service this customer group well. However, unexpected contractual complications and lack of National Grid staff resources have slowed the effort to utilize this outside partner considerably. The Company is still in the process of developing this relationship and hopes that an agreement will be in place by the end of 2016 so that customers will begin to be served in the first part of 2017.

In 2017, National Grid will also explore the benefits of offering prescriptive incentives for Energy Star or other energy efficient computer servers that replace existing equipment. (Previous efforts have focused mainly on the energy savings associated with HVAC and UPS improvements.) The Company will also investigate the savings potential for data center management power management software. The savings from this software will be analyzed on a case by case basis.

3. Farm/Agriculture

A couple of years ago OER and National Grid began an effort to serve farm and agricultural customers in the state of Rhode Island. Under the informal agreement between OER and the Company an allocation of Regional Greenhouse Gas Initiative (RGGI) funds were used to perform the audits at the pilot farms, train auditors, develop a list of technically sound measures, and create a fund to pay for energy efficiency incentives for delivered fuels (oil, propane). National Grid agreed to cover electric and natural gas energy efficiency incentives in accordance with Company policies.

In 2016, audit reports and recommendations were delivered to all nine pilot farms. Several farms have commenced with installing measures and the rest are evaluating which measures are best for their specific situations.

In Q4 2016, National Grid and OER will create updated and co-branded marketing pieces for this initiative. In early 2017, National Grid's vendor for this program will begin calling a list of farm/agricultural facilities, provided by OER, to educate them about the program and encourage farms to complete an audit of their facilities. The Company hypothesizes that these efforts will result in 10 more locations audited and 7 more participants in the program.

Multifamily Sector

The Multifamily Initiative will continue to provide joint residential and commercial energy services to condominiums or apartment complexes for energy efficiency upgrades. The C&I program specifically offers incentives for master metered gas measures that typically include boiler reset controls, insulation and air sealing and the rest is addressed through residential incentives through a common point of contact. The Company expects a handful of multifamily new construction high rise projects to come through the C&I programs. Since the Company does not expect the volume of new construction applications to be too high, they will be served through its current C&I new construction programs in coordination with the residential program.

Approach to Other Market Sectors

Hospitals: The Company will continue to work with Rhode Island's five largest hospitals (all under one partnership) through the multiyear Strategic Energy Management Planning (SEMP) initiative (refer to the SEMP section for more details). The medium sized healthcare facilities will continue to be addressed through the channel sales group.

Colleges and Universities: These are currently served through either the Company's large commercial programs with a dedicated sales team or the Company's SEMP initiative. With a master-metered portfolio of buildings within the campus, most universities are tied to sustainability goals and climate action plans to reduce their greenhouse gas emissions. The Company's SEMP initiative allows enrolled university customers to engage in multi-year campus energy planning and assists them in identifying comprehensive and long-term energy efficiency opportunities. The Company will continue to explore opportunities for further SEMP university customers. Besides SEMP, the Company continues to provide energy services to the other colleges in RI.

Commercial Real Estate and Offices: The Company's sales team continues to see many challenges and barriers in program participation of Commercial Real Estate (CRE) sector mainly due to the split incentive between owners and tenants. There are three ways the Company will promote EE services to this sector:

- Sustainable Office Design: The Company will continue to market the "Sustainable Office Design" (SOD) initiative to address Class A type office spaces The Sustainable Office Design (SOD) initiative promotes high-performance office lighting and controls for quick turnaround tenant fit-outs. This is an easy to use, performance-based design approach that benefits owners or tenants with energy savings depending upon the lease arrangements. A fixed incentive per square foot along with a pre-set design criteria and lighting designer incentives will provide easy participation for the tenant fit-out projects. In 2017, the Company will look for ways to inform tenants and leasing agencies of this opportunity so that there is participation in this initiative. In future years, the SOD plans to incorporate HVAC and plug loads as part of the measure mix.

- The Company may consider an initiative that will target a select list of leased spaces and owner occupied customers. While Commercial Real Estate (CRE) is defined broadly to include retail stores, industrial parks and multifamily properties, the Company sees office buildings as the primary target. Office buildings are a good target for Energy Star labels as studies have shown that Energy Star certified CRE buildings have a better chance of higher rent and value for their tenant spaces. This initiative will focus on an initial offer of tailored benchmarking services for one or several of a select customer (or customers) properties. ENERGY STAR Portfolio Manager may be used for the tailored benchmarking. Once benchmarking is complete, a portfolio summary, benchmark report with scoring (scored against similar CRE properties) along with opportunities for further improvement will be provided. This will be followed by the Company's regular EE services and pathways if the customer is interested in pursuing opportunities listed in the benchmarking report.

Trade Ally Engagement (TRAEN)

Beginning in 2015, a Trade Ally Engagement (TRAEN) initiative was introduced to Rhode Island as part of an effort to reduce time in completing application forms for customers and contractors. This is a 48 hour pre-inspection service in which contractors call the vendor to schedule a pre-inspection of their commercial prescriptive electric lighting and variable speed drive (VSD) projects. The vendor handles the application process and hands off the project to National Grid after sending a pre-approval letter to the customer and contractor.

This initiative will continue to be used by the Channel Sales team as well as a few distributors during 2017. However, marketing has been discontinued due to limited appeal.

Education and Training

National Grid is committed to promoting leadership in the community, the various market sectors, and trade organizations and associations by providing and sponsoring initiatives and outreach efforts for education and training.

The Company, as in previous program years, will continue to support opportunities to inform customers and trade allies/vendors/contractors that serve the various market sectors, about existing and new or emerging energy efficient technologies, building systems and design, building energy codes and standards, improved installation practices, and up-to-date operation and maintenance (O&M) procedures. By integrating local, regional and national educational and training initiatives throughout National Grid's various C&I programs, the Company hopes to build awareness about the benefits of energy efficient technologies, market National Grid's energy efficiency programs, as well providing expertise and experience on the need for integrated design, and improved construction and installation practices for an existing or new construction building project. This includes support of the high performance schools energy summit. Deeper energy savings, as well as other non-energy benefits, can be achieved for any given customer project when the customer, designer/engineer, or contractor/installer is able to express or share knowledge about an energy efficient technology, the associated costs, and energy savings potential.

Building Operator Certification Training (BOC)

BOC Levels I & II include HVAC, lighting and building controls. Students gain knowledge of their own building by completing projects involving documentation of building equipment, systems and controls; benchmarking the building's performance using ENERGY STAR® Portfolio Manager™; updating occupancy profiles; reviewing HVAC systems and operation and mapping the facility's electrical distribution system. In addition, the course addresses maintenance of building systems, equipment troubleshooting, preventive maintenance, advanced electrical diagnostics, as well as HVAC optimization.

In 2017, the company plans to support Building Operator Certification (BOC) training by holding at least three Level I BOC classes in Rhode Island and Massachusetts. The classes are planned to be held in Providence and Worcester. Classes will be held in the spring and the fall.

The audience consists of facility managers, operating engineers, building technicians, and maintenance mechanics. The course provides a core foundation across the various building systems and maintenance practices of a typical commercial building – class instructors

encourage class participation. In addition to the knowledge gained by listening to the instructors and completing both in classroom as well as out of classroom projects, the participants benefit from networking and learning from each other's experiences with building maintenance and energy efficiency. At each new course, an overview of the Company's commercial energy efficiency programs is given. Student satisfaction with the BOC training is high in that they would recommend it to others and their companies are likely to engage utility energy efficiency incentives for energy projects.

Affordability and Financing

Over the past two years, the Company along with the State and Council, have made progress researching, planning and developing opportunities for finance mechanisms that will help customers overcome cost barriers and promote affordability for investments in energy efficiency. In 2017 the Company plans to continue to support these activities in a variety of ways. This section outlines ongoing efforts for the Company's revolving loan fund with an On Bill Repayment process for small and large business customers, and the RI Infrastructure Bank's (RIIB) Commercial Property Assessed Clean Energy (C-PACE) and Efficiency Building Fund (EBF).

It is important that new and existing financing models be available for all customer types. While customer eligibility differs for the finance mechanisms in the 2017 Plan, together the three mechanisms offer opportunities to a broad spectrum of customers.

Together, the various finance mechanisms available in 2017 offer an immense opportunity to customers. Therefore, the Company is interested in creating a long-term vision for finance that will 1) create finance opportunities for all large and small commercial and industrial customers and 2) create a sustainable source of funding for efficiency that will decrease the energy efficiency program surcharge over time from what it would otherwise be. This vision will require the State, Council and Company to work together to offer a variety of finance mechanisms with enough capital to support a significant portion of C&I customer costs each and every year. National Grid envisions that, in combination with EBF, C-PACE and Company revolving loan funds, potentially up to half of all C&I electric customer costs can be financed by 2020.

Lastly, in order to create sustainable sources of finance to drive significant energy savings for commercial customers in the future, the Company will support and facilitate ongoing research that the Council identifies on this topic.

On Bill Repayment (OBR)

For large C&I customers the Company will continue to offer finance to help pay for customer costs through OBR from revolving loan funds. National Grid finances the customer portion of electric or gas efficiency projects, on bill, for up to five years at 0% interest. OBR offers easy

access to finance as well as creates reduced customer transactional friction by easing the repayment process by offering the repayment of the loans on the electric bill. All customers are eligible for OBR.

Over the years, the Large C&I electric revolving loan fund has grown to approximately $14 million and the Company is proposing that $1.0 million in new electric energy efficiency program charge collections be transferred to the Large C&I revolving loan fund to support the sustained longevity of the loan fund. A recent evaluation of the Company's Large C&I revolving loan fund by The Cadmus Group, Inc. (Cadmus) concludes that the loan fund requires substantial future allocations to fulfill its potential for increased participation. Cadmus also recommends the establishment of a funding schedule that will support future participation projections.[2] Stable fund injections will provide the C&I sales team to better leverage the dollars available in the fund and to market financing to more customers.

Since 2014, participation in the Large C&I loan fund has increased by approximately 60% per year. The Company forecasts increasing demand of $9 million to $13 million per year in new Large C&I loans over the next several years. In order to meet this demand, while promoting the long-term stability of the loan fund, the Company believes a modest injection in 2017 is a prudent investment.

The Company began committing finance for large commercial gas efficiency projects in 2015. These funds are in various stages of the finance process and a fraction of the funds are available to repurpose and commit to customers each year. The gas revolving loan fund has increased to approximately $1.5 million and the Company plans to add $500,000 from the finance cost budget item into the fund in 2017.

For small business customers, the Company continues from past years' successful experiences to offer on bill repayment for the customer portion of the project over 12 or 24 months. The Small Business Revolving Loan Fund totals $4.1 million. Due to changing ways in which energy savings are delivered to small business customers, the Company believes that the volume and amount of small business loans will increase in 2017, with more customers opting for the 24-60 month option. In order to meet this projected demand, the Company plans to add $300,000 from the finance cost budget item. National Grid's revolving loan fund projections for 2017 are illustrated in Attachment 5, Table E-10 and Attachment 6, Table G-10.

Additionally, for state and municipal customers, the Company will continue to manage the revolving loan fund that was established as part of the RI Public Energy Partnership (RI PEP) with

[2] The Cadmus Group, Inc., Large Commercial and Industrial On-Bill Repayment Program Evaluation, September 20, 2016.

OER. The Public Sector Revolving Loan Fund had more than $1.3 million in deposits. By year end 2016, it is projected to have more than $700,000 in the fund and $300,000 will be repaid throughout 2017. This does not include the commitments that the Company has made to customers for approximately $270,000. OER has indicated that it will authorize transfer during 2017 of $500,000 from the electric Public Sector Revolving Loan fund (originally funded through RGGI), included in Attachment 5, Table E-10 to the Rhode Island Infrastructure Bank.[3] A portion of the revolving loan fund was seeded by OER under the RGGI Allocation plans. The loan fund projections for 2017 are illustrated in Attachment 5, Table E-10.

Rhode Island Infrastructure Bank – Efficient Buildings Fund

Rhode Island Infrastructure Bank (RIIB), formerly known as the Rhode Island Clean Water Finance Agency, was established to administer certain federal and state programs relating to municipal or community waste water and drinking water financial assistance. June 2015, legislation renamed the Agency as the Rhode Island Infrastructure Bank and expanded the programs to be administered by the Bank, including commercial and residential Property Assessed Clean Energy (PACE) programs. National Grid representatives, along with other stakeholders, like OER, worked closely with RIIB before the launch of the program on topics such as process mapping, systems integration, technical support, tighter integration of EE and renewables, and focusing on how the Company can use the privately-financed C-PACE creatively to rely less on SBC charge. The National Grid Sales teams also worked closely with RIIB and offered technical assistance, audits and coordinated the savings and incentive information on behalf of customers.

EBF closed round 1 of project funding in July 2016, funding approximately $18 million of projects. This project funding for 2016 was supported with approximately $1.8 million in energy efficiency funds collected by National Grid. In 2017, RIIB proposes to hold a second round of finance funding for municipalities through the EBF. It projects to offer $40 million to $50 million in customer finance at attractive interest rates for efficiency retrofits and renewable installations. In order to support energy efficiency in municipalities, National Grid will invest in the loan fund, offer technical assistance and incentivize the cost-effective retrofit projects.

RIIB has requested $5.0 million of energy efficiency funds for 2017 from National Grid, in order to finance the second round of in energy efficiency and renewable projects through the Efficient Buildings Fund. RIIB projects that 60% of the project funding will be for energy efficiency projects and 40% will be for renewables projects (under current regulations system benefit charge funds may only be utilized to support energy efficiency projects, and RIIB's renewable projects will be supported by other sources of funds). National Grid proposes to support the

[3] Please note that RGGI funds may be used by RIIB to support renewable or energy efficiency projects.

energy efficiency efforts of RIIB with a total of $5.0 million. The $5.0 million is included as $4.9 million in the 2017 electric budget, identified as RIIB in Attachment 5, Table E-2 and as $100,000 in the 2017 gas budget, included as RIIB in Attachment 6, Table G-2. Overall, this proposed funding of $5.0 million will be dedicated to support energy efficiency projects. Finally, to support RIIB's success, National Grid will fund approximately $100,000 in technical assistance studies. National Grid will also incentivize the cost-effective efficiency projects for electric and gas retrofits. RIIB round 2 projects will yield approximately 11,000 Annual MWh and 5,000 Annual Dth of savings. National Grid and RIIB have begun to work together to establish reporting frameworks and regular communication channels to monitor savings performance of the EBF energy efficiency projects, consistent with National Grid's obligations for transparency and reporting.

Commercial Property Assessed Clean Energy (C- PACE)

C-PACE is an innovative way for customers to obtain long- term low-cost financing for energy efficiency, clean energy and other building improvements in their privately owned businesses or non-profits. Importantly, C-PACE offerings are financed through private capital and do not necessitate an allocation of ratepayer dollars. Voluntary assessments for repaying municipal bonds have been attached to property taxes since the early 1800s to fund projects for public good such as sidewalks, fire stations, and street lighting. The C-PACE financing repayment is facilitated through the same municipal property tax assessment process. A voluntary assessment (similar to a sewer district assessment) is placed on the building owner's property tax bill. The assessment is repaid over the financing term (up to 25 years, project dependent) and the annual energy cost savings will, in most cases, exceed the annual assessment payment, thereby enabling capital intensive equipment upgrades.

In 2016, National Grid has been working closely with RIIB and its program administrator Sustainable Real Estate Solutions (SRS) to launch a successful C-PACE program in Rhode Island. At the beginning of the year, National Grid participated in a series of meetings to educate RIIB and SRS in the basics of how its programs operate and to assist in writing initial program guidelines. The Company also led a day long charrette and series of meetings to talk about the how the C-PACE program could be integrated into the sales process of National Grid staff and its turn key Project Expeditor (PEX) vendors.

Recently, the Company's work with SRS has included weekly meetings to work through the long process of making sure that –

1. National Grid sales staff knows the fundamentals of the C-PACE program and where it can be effectively used.
2. National Grid vendors know the fundamentals of the C-PACE program and where it can be effectively used.

3. Mapping out the steps of exactly how the program will work with the many ways that customers may start their interaction with National Grid.

The Company believes that C-PACE could fundamentally change the way National Grid interacts with some customers in the future. If properly wielded by the Company's sales staff and vendor partners, National Grid believes that customers will choose to complete projects that they might have not considered viable prior to this point in time.

C&I Energy Efficiency Programs

The C&I Energy Efficiency programs are organized in the same way as the built environment – customers are making decisions around their investment in higher performing new construction and existing buildings. Depending on the needs and size of the customer within each of the segments, customers can participate in one of three energy efficiency programs:

- The Large Commercial and Industrial New Construction Program
- The Large Commercial Retrofit Program
- The Small Business Direct Install (SMB/DI) Program

Although there are three programs in the C&I sector for 2016, all C&I customers are eligible to participate in the Large Commercial and Industrial New Construction Program and the Large Commercial Retrofit Program. However, the Small Business Direct Install (SMB/DI) Program is restricted to customers with 200 kW or less average monthly peak demand. Larger and more complicated measures not offered by the SMB/DI vendor go through the New Construction or Retrofit Programs. The following sections describe the various offerings under these three programs. In addition, a logic model describing the C&I programs and how they relate to short and long-term outcomes is provided in the Appendix of this Attachment 2.

Large Commercial and Industrial New Construction Program

The new construction program is divided into two main categories:

1. New Buildings, major renovations and tenant fit-ups: This is specifically for those projects that are ground up new construction or major renovations all of which traditionally involve some level of design and are governed by code. The section below describes this in detail.

2. End of life replacements – typically no design component, but governed by codes and standards in some cases because it has reached the end of its life. The baseline energy is considered to be the energy code and savings are calculated from the baseline code.

This works the same way as the "systems approach" described below, whether through prescriptive or custom pathways.

New Buildings, major renovations and tenant fit-ups: The services and incentives offered are designed to promote and support high performance building design, equipment selection, and building operation. This program offers both technical assistance and financial incentives based on projected energy savings performance to incentivize building beyond the current energy code baselines. Technical assistance ranges from simple plan review and efficiency upgrade recommendations to complete technical reviews of energy models. The program offers two approaches for ground up new construction or major renovation projects:

- **Systems Approach**: The Systems Approach is designed for individual measures and for those projects applying later in the design process and which are generally focused on one or two energy systems to increase efficiency. The graph below describes the various paths available to the projects.
- **Whole Building Approach**: The Whole Building Approach takes into account a comprehensive analysis of all building measures together and requires collaboration between National Grid and the Design Team from the conceptual design phase through project completion. It encompasses consideration of all energy saving opportunities, including shell, fenestration, equipment and system interactions.

Systems Approach for New Construction

There are a few ways a customer can take advantage of the New Construction Program using the "Systems Approach."

1.a. **Prescriptive Path:** The prescriptive path is the quickest and simplest way to participate in the New Construction Program. This is used for equipment that is commonly replacing less efficient equipment and for which savings data is available due to the length of time the measure has been in the marketplace and the number of installations is large enough for there to be a representative sample. A fixed dollar amount is paid to the customer for replacement of a specific piece of equipment.

1.b. **Custom Express Path:** The custom express path is used when a measure may be relatively new to market. It is a more streamlined approach than the custom path. A Custom Express tool is used to determine the project's eligibility for an incentive on a case by case basis. This path can be used in conjunction with the New Construction Program but it is more commonly used for Retrofit applications. The amount of the incentive for a measure going through the custom express path can vary from project to project based on projected savings.

1.c. **Custom Path:** For customers who wish to achieve deeper and broader savings compared to prescriptive offerings, a custom path is available. This involves a more

complex engineering analysis and is frequently used by customers considering complex HVAC equipment and systems. Custom incentives for new construction projects are designed to cover up to 75% of the incremental cost between standard and premium efficiency equipment.

Since 2014, the sales team has had flexibility in offering incentives that can be negotiated with customers. The Sales staff determines how to negotiate, based on the customer's financial needs. This approach helps the Company to maintain cost control with program budgets.

In 2017, the Company will continue offering custom gas and electric measure options. (Please refer to the appendix at the end of this attachment for a sample of custom measures.)

1. Under the "**Whole Building Approach**"**,** there are two main pathways for customers who choose to do comprehensive and integrated designs for their projects.

a. **Integrated Design Approach** is most applicable for buildings that are greater than 100,000 square feet or buildings smaller than this size that are not a good fit for the Advanced Buildings path. Both owners and design teams are eligible for incentives or projects that perform 10% better than the energy code. Due to stringency of the new IECC 2015 code that will take into effect starting 2017, the program requirement has dropped from 15% to 10% for the new program year. This is based on cost benefit analysis conducted by the Company's internal MA and RI teams. Same as in 2016, incentives are based on a cost per electric and gas savings. In addition, because this path requires a significant amount of effort from the design teams, incentives based on costs/savings are also provided to design teams. In addition, a fixed incentive is offered to design teams for attending a design charrette/workshop that will enable them to incorporate energy efficiency early within the project stages.

b. **Integrated Design Express:** This pathway was formerly known as Advanced Buildings® (AB) pathway designed for a range of building types, including offices, schools, retail, and public assembly in the 10,000 to 100,000 square foot range. Projects had to meet all the parameters in the AB Guide Book and when they achieved all requirements, a fixed incentive based on sq ft was provided to customers. In 2016, the sales and technical team decided to eliminate this option from the whole building approach. This was due to the following reasons:

i. The upcoming IECC 2015 stricter version of the energy codes for 2017 may not allow for a prescriptive approach that would provide significant

predictable savings for the broad range of build types within the 10K to 100K category.

ii. Even the current version of AB was proving to be difficult for projects to meet (which goes beyond the 2012 IECC). Fewer projects in RI attempted the program and even fewer were successful. The specific envelope and fan power requirements beyond the 2012 IECC were major problems for many projects.

For these building types, in 2017, the Company will introduce a modified approach called the Integrated Design Express. This will include dedicated internal staff and consultant time to assist these projects to meet the 10% above building energy code. The Company will develop streamlined and express process for this pathway. A charette and design team incentive will also be provided to project teams who participate in this initiative. Incentives will be based on a fixed cost per electric and gas savings.

Operational Verification

To ensure energy savings projects are installed and operated as designed, the Company will continue to provide operational verification service in 2017 as in previous program years. This service will continue to be served by independent third-party vendors for verification of complex building systems, including HVAC projects involving energy management systems or other controls, ensuring proper installation and operation as designed. National Grid requires all projects which receive an incentive over $100,000 to undergo operational verification. This service (also termed as 'commissioning' in building industry terms) is also promoted for any projects where the savings are dependent on control measures or operational improvements. Typically National Grid provides these services at no cost.

Initiatives specific to New Construction

Specific initiatives are listed below within the new construction portfolio that address unique needs of the new construction market sector:

1. Solid State Street Lighting

Based on the feedback it received from Rhode Island cities and towns, the Company estimates total savings to be approximately 35,000-37,000 MWh for solid state street lighting in Rhode Island. As of this filing, approximately one dozen cities and towns have expressed interest in purchasing their own street lights. In 2016, the Company expects approximately 38% of total expected savings from street lights and controls to be installed with the majority of these (over 80%) being from the City of Providence. An additional 29% of the total expected savings from

street lights and controls are expected during 2017. This leaves approximately one-third of the expected savings for future years (2018-2020).

Customer Owned Street Light Equipment

Prior to rolling out the customer-owned street lighting tariff in 2014 and the energy efficiency program to customers, the Company held numerous meetings with municipalities and OER to ensure that customers understood what was involved in the process the assets and equipment going forward.

Beginning in 2016, the Company received the first requests for municipal customers in Rhode Island to purchase their own street lights from National Grid in anticipation of converting them to solid state street lighting and in some cases, attaching adjustable controls. In 2017, the Company anticipates that interest will continue. If a municipality is interested in purchasing its street lights, the municipality requests a preliminary pricing valuation based on the unamortized value of the assets. In response, National Grid provides the municipality with a detailed lighting inventory, which includes a summary of the number and type of lights that would be included in the purchase. The package includes along with the purchase price for the lighting, informational guidelines and templates of all closing documents.

When the municipality chooses to proceed with the sale, the municipality sends National Grid a Notice to Purchase letter. Upon receipt, National Grid updates the inventory and purchase price and prepares closing documents for execution by the municipality and National Grid. The municipality may forgo the preliminary inquiry step and proceed directly to the Notice of Purchase.

National Grid recommends that municipal customers purchase LED fixtures and controls that meet the criteria of the Design Lights Consortium or Energy Star to take advantage of the Company's energy efficiency incentives. Information regarding energy efficiency incentives is provided by National Grid and OER. Historically, National Grid has not provided lighting design for street lighting because this is a customer option based on safety and security needs as well as the aesthetic preference.

Since the beginning of 2015, the Company has offered incentives to municipal customers of $0.15 per kWh of first-year savings for qualifying LEDs and $0.25 per kWh of first-year savings for qualifying controls associated with either the dimming or part-night run hours as set forth in the street lighting tariff. These incentive levels will continue in 2017.

In addition to the funding provided by the systems benefit charge mentioned above, in 2016 the OER is offering funding for the installation of LEDs and controls in street lighting to municipal customers with a cap of $300,000 per city or town.

Beginning in 2016, Rhode Island communities began to benefit from the Rhode Island Infrastructure Bank's (RIIB) Efficient Buildings Fund. Interested cities and towns applied for this funding during the Spring 2016. This funding is expected to continue for calendar year 2017.

Company Owned Street Light Equipment

On July 1, 2016, the Company filed proposed amendment to the tariffs for company owned street and area lighting to provide an LED option for customers. Once this filing is approved by the PUC, if a customer prefers to continue leasing its street lights from National Grid and requests the exchange of existing luminaires to LED, the energy efficiency incentive will be the same amount ($0.15 per kWh of first-year savings) as is offered for qualifying LEDs in the customer-owned option. This incentive offering was presented to and agreed upon by the Collaborative in March 2016. The current company street lighting tariffs for company owned equipment do not include adjustable controls. Therefore, there is no energy efficiency incentive currently available for these adjustable controls. However, as the technology evolves and if it becomes cost effective, the Company would then consider the inclusion of adjustable controls or operating schedules in a future tariff filing and also include an incentive in a future energy efficiency program for company owned street lights.

At the time of this filing, the Company's filing, Docket 4628, has not yet been approved. Once they are approved and the options and pricing is finalized, the Company will perform outreach with customers to inform them of details and benefits of company owned and maintained LED street lights. This will include a marketing piece.

Similar to a multifamily building or leased commercial space where the tenant pays the electric bill, as long as the landlord (in this case, National Grid) approves the retrofit, the customer leasing the street lights will receive the energy efficiency incentive directly.

The table below reflects some of the similarities and differences between the two ownership options that will be available to municipal customers for solid state street lighting once the company-owned tariff is approved.

Distinction	Customer- Owned	Company-Owned
LED equipment	Customer owns the asset and is responsible for purchase, financing, and maintenance.	National Grid owns, installs and maintains the equipment. The customer requests the exchange of existing or installation of new lighting.

Energy efficiency incentive	Customer receives a one-time incentive at the time of installation of LED equipment (after satisfactory post-inspection by National Grid)	Company approves payment of a one-time incentive to the customer of record for the LED equipment (after satisfactory post-inspection by National Grid.)
Distinction	Customer Owned	Company Owned
Purchase/lease	Customer purchases the asset	National Grid leases the asset to the customer
Outreach	League of Cities and Towns, Annual Department of Public Works (DPW) meeting with Company, and various other meetings	League of Cities and Towns, Annual DPW meeting with Company, and various other meetings
Technical Support	Customer is responsible	Customer is responsible

2. Building Energy Code and Appliance Standards

Codes:

The Codes and Standards initiative (C&S) is an innovative efficiency offering that saves energy on behalf of customers by creating: 1) an environment that achieves greater compliance with the state building energy codes, and 2) strengthens and promotes energy efficient appliance standards and accompanying consumer purchasing incentives. Two components of the codes work are described below:

1. Code Compliance Enhancement Initiative (CCEI) is a focal point of the C&S initiative. The CCEI will be entering its fourth full year in 2017 and will continue to build upon the successes of previous years. CCEI includes in-person classroom and hands-on trainings, webinar presentations, project-specific technical assistance circuit riding, and dissemination of documentation/compliance tools like residential field guide, residential and commercial FAQs, technical bulletins, and case studies. There are, and will continue to be, associated energy savings attributable to the Company for its efforts in helping to improve Rhode Island's energy code compliance rates. CCEI focuses on both ground up new construction/major renovation and alterations/additions for residential and commercial buildings. Since 2014 a total of 130 classrooms and on site trainings have been delivered through this initiative. This year a compliance evaluation study (whose results are due end of this year) was conducted for commercial projects, that will be followed by another study for residential projects in 2017. Results of both studies will be used to:

a) analyze the impact of CCEI trainings to improve compliance,

b) update the savings calculation method based on new compliance numbers

c) create new ideas or modify existing delivery approach to address compliance.

The Company will continue to deliver commercial and residential energy code trainings throughout 2017. While the content of trainings previously focused on transitioning from 2009 to 2012 IECC, trainings in 2017 will complement and support Rhode Island's upcoming transition to 2015 IECC. The Company is planning to deliver 12 residential and 12 commercial classroom trainings and 8 location-based trainings in 2017. The Company will also offer several live webinars. These trainings will be geographically dispersed around the State and will be marketed to local code officials, design professionals, builders, contractors, energy specialists, etc.

The Company will conduct topic-specific training sessions in 2017, and these sessions will focus on the building envelope, HVAC, and electrical sections of the code. The Company will also deliver in-field/on-site demonstration trainings as a means to complement classroom trainings and will visually relate topics discussed directly to real-world situations. Webinars will be conducted on specific residential and commercial sub-topics covered in the classroom sessions.

Technical assistance pertaining to energy codes and related matters will be provided via energy code circuit riders. In 2015 and 2016 CCEI handled 50 residential and 14 commercial circuit rider calls, and 18 residential and one commercial circuit rider site visits. In 2017 again, circuit riders will be available to answer questions either by phone or in-person. Greater emphasis will be made to market and promote the service in hopes of increasing the number of in-field/on-site visits. The Company hopes that these types of visits will be useful in clarifying any confusion or misunderstandings that building design and construction professionals may have about energy codes, and to ultimately support their efforts to better understand and execute code compliant building designs. In addition, the circuit riders and the trainings will educate the attendees about the Company's incentive programs that go beyond the code, thereby cross promoting its programs.

The Company will continue to work with the RI Building Code Commission to accommodate third party energy code specialists as optional energy related building inspectors for applicable projects undergoing the permitting process. In 2017, this initiative will also continue to refine documentation/compliance tools created between 2013-2016, such as energy code checklists, technical bulletins, FAQ's and recently developed reference guides.

2. Stretch Code development:

The Governor's December 2015 Executive Order "State Agencies to Lead by Example in Energy Efficiency and Clean Energy" requires OER to coordinate with EERMC, National Grid, and the

Green Building Advisory Council to establish a voluntary or "stretch building code" that is based on the International Green Construction Code or equivalent by 2017. The use of this code will result in long term energy savings that will assist state agencies in meeting their energy reduction and sustainability targets. In 2016, the Company has been meeting with this group to establish the energy related aspects of the stretch code for commercial buildings that will wrap up in December 2016. In 2017, the Company will focus on energy aspects of the residential stretch code. In general, the Company's involvement in stretch code development will be as follows:

1. Guide OER and other entities on the basic structure of stretch code specific to energy
2. Provide technical expertise on specific efficiency requirements for stretch code as it relates to energy
3. Conduct stretch code specific trainings along with the base code trainings (as detailed out in section above)
4. Align the Company's new construction program with stretch code specifications as much as possible and within the framework of the Company's policy around EE programs
5. Advocate for a stretch code option to the Company's customers and work with customers to achieve the stretch code requirements.
6. Work with the internal evaluation team to develop a mechanism to claim savings for stretch code projects.

Appliance Standards:

The goal of this initiative is to accelerate the development and adoption of selected new appliances as State level standards (better energy performance than federal standards), thereby increasing the efficiency of appliances sold and used in the State of Rhode Island. In 2016, the Company worked with associated stakeholders to identify a target list of potential appliances. Some of these include battery chargers, commercial dishwashers, portable electric spas, pool pumps etc. However, since this was not a priority for state legislatures at this time, the Bill didn't get incorporated. The Company will continue to advocate for proposed State appliance legislation in 2017 as well as to provide technical support regarding such parameters as market potential, energy savings, and life-cycle cost analysis. The Company will also work with associated stakeholders to develop a methodology to claim savings for this effort. The Company is also currently in discussion with California Utilities to partner with them in advocating for federal standards.

4. **Exterior Performance Lighting and Controls:** The goal of this initiative is to extend the Company's existing performance lighting offering (currently offered to new and retrofit projects) to exterior lighting applications. Through this initiative, the Company plans to encourage:

    a. An understanding of exterior lighting codes
    b. Code based lighting controls for exterior projects
    c. Code based exterior lighting design that promotes best practices while saving energy.
    d. Lighting designers to understand exterior lighting codes, and to design to exceed code through innovative designs and technologies

In 2017, the Company will partner with a local lighting organization: Illumination Engineering Society (IES-NE) to host an event and invite its membership of lighting designers, architects and engineers. The Company is also developing a simple web based application (to replace its PDF applications) that will increase participation and tracking of all code-based lighting projects while educating participants on the code requirements including exterior lighting codes.

5. Energy Efficiency Integration with Solar

Similar to the residential program, in 2017, the Company will continue to collaborate with OER to align C&I energy efficiency incentives with the Renewable Energy Growth (RE Growth) statute 39-26.6-19, the SolarWise program that integrates energy efficiency with solar installations. The SolarWise program provides bonus solar incentives on top of the standard RE Growth ceiling price for solar incentives if participating projects first achieve energy efficiency through the Company's EE programs. A tiered approach for solar incentives was developed for new construction projects based on a percentage of energy savings which are better than code (aligned with Integrated Design program requirements) and retrofit projects based on percent increase over existing performance. This collaboration will not add any cost to the C&I portfolio.

Demonstration/R&D Projects specific to New Construction

1. Zero Energy Demonstration Projects

In 2015 the Company created a task force/advisory council that included key stakeholders in Rhode Island. These stakeholders represent many facets of the existing and future Zero Energy Buildings (ZEB) market and bring experience, entrepreneurship, and a desire for Rhode Island to lead the country in the ZEB market. The Task Force created a White Paper in 2016 to be submitted to the Governor's office at the time of the writing of this plan that recommends policies, incentives, education, financing and partnerships that will help foster the growth of the residential and commercial ZEB market in Rhode Island.

As part of the recommendations, the Company plans to identify one to two commercial demonstration projects to test new ways of supporting/promoting zero energy buildings. Zero Energy Buildings are the future of the 'new construction' program in RI. The focus of the demonstration projects is to showcase ZEB "Ready" design with low Energy Use Intensity (EUI) such that the rest of the energy use of the buildings can be supported by renewable energy. The Company will provide technical support and incentives for high performance measures that will result in low EUIs. This may include a study of the renewables systems and their performance in addition to the efficiency elements. To understand post-occupancy performance of these buildings, the Company will measure their performance after they are constructed. This ongoing post construction analysis will require: extra metering, data analysis and intensive commissioning work that falls outside the scope of the Company's standard EE program.

2. Power over Ethernet (PoE) lighting system for new construction or major renovation.

The Power over Ethernet (PoE) lighting system provides DC power and data to LED fixtures using Ethernet cable (Cat5) which is regulated by the IEEE 802.3 standard. Each PoE, LED lighting fixture has an individually addressable IP address, by adding addressable sensors to the network and creates a smart LED hub. Each PoE intelligent LED hub can collect information on ambient lighting, temperature, humidity, and anonymous room-occupancy data which it then communicates back to a controller. This PoE system provides enhanced controllability beyond code and can continuously optimize the performance of all the building systems to decrease building energy use. It also provides energy use monitoring and enabling of demand response events. Customers can add additional value by optimizing space reservations, and reducing cleaning and maintenance based on real time space usage. This will demonstrate an emerging infrastructure and controls technology with energy management potential as well as other non-energy related benefits. In coordination with DOE and other organizations, the Company hopes to gain a better understanding of how to match PoE Lighting solutions with the right market sectors such as data centers, but also see potential in schools, office spaces and specialty retail.

Large Commercial Retrofit Program

The Large Commercial Retrofit Program serves the needs of existing buildings in their pursuit to lower energy consumption This program includes three distinct components (similar to the New Construction program) each aimed to address specific market barriers and to advance efficiency: Prescriptive incentives are intended to support trade allies in advancing energy efficiency sales and to provide signals to customers who are making direct purchases that will encourage them to adopt the more efficient and more expensive option; custom which provides services to investigate opportunities to increase efficiency and supports the steps needed to implement the upgrades and upstream delivery that provides a more efficient way for customers to receive reduced pricing at the point of sale for energy efficient equipment purchased.

Pathways to Meet Program Requirements

Prescriptive Path

Prescriptive incentives are available in this program for some of the more commonly installed pieces of energy efficient equipment that are replacing standard efficiency equipment. Manual application forms have been available on the Company's website for customers and contractors to use when applying for incentives. Beginning in January 2014, prescriptive gas incentives were offered online. In 2017 National Grid plans to roll out an electronic application for customers to apply for prescriptive electric incentives.

In 2017, the Company will continue to offer prescriptive gas and electric incentive options. Wi-Fi thermostats will be added to the program as a gas saving measure. For more details on measure descriptions refer to Attachment 2017 Technical Reference Manual.

Custom Express Path

Similar to the New Construction Program above, the Retrofit Program also offers a custom express path for select retrofit measures.

Custom Path

A customized approach that assesses the operations of the building through a technical assessment report (TA study) is usually the first step a customer experiences before applying for a custom incentive. These incentives are designed to move customers to purchase and install premium efficiency measures. The incentives cover up to 50% of the total project cost including labor and equipment.

The ability to negotiate custom incentive levels and TA costs for some of the largest customers will also be available for this program. See more details on this in the Large New Construction section above.

In 2017, the Company will continue to offer custom gas and electric incentives. Refer to the appendix at the end of this attachment for a sample of custom measures and new technologies. In addition, the following technologies will be tested through building projects:

Heat Exchanger Cleaning

During 2016, a demonstration project on heat exchanger cleaning was completed in Boston. In 2017, there is a plan to roll this out to Rhode Island customers, as the expectation is that this will be a good measure in terms of natural gas savings. These are shell and tube steam to hot water converters that are used for heating and domestic hot water in hospitals, hotels and

industry. The first demonstration project is predicting 19,000 Therms annual savings for 10 similarly sized heat exchangers. Savings will vary based on number of heat exchangers cleaned, size of system and hot water loads.

Xeros Polymer Laundry Solutions

There is a new technology on the market for commercial laundry operations which used 80% less water, 50% less energy (natural gas) and 50% less detergent than the more traditional equipment. The market sector for this equipment crosses over the Company's traditional market sectors – it includes commercial laundry facilities, laundromats, universities, and hotels. In addition to the obvious energy saving benefits, there are other benefits associated with this technology including requiring a lower temperature to operate, ability to get out stains other cleaning cannot do, ability to complete a cycle in less time, and ability to clean some materials that were previously unable to be cleaned.

On-Premise Laundry

There are some on-premise laundry solutions to reduce natural gas energy usage including ozone, condensing equipment and a retrofit for dryers. National Grid has some experience in offering incentives to customers installing this equipment. During 2017, case studies and webinars will be provided to further encourage customers to embrace these technologies.

Steam Trap Smart Tags

In conjunction with doing a steam trap survey, smart tags can be added to each steam trap being reviewed. The steam trap vendor hangs the tag on each trap and provides National Grid and the customer with a spreadsheet providing information on the status of each steam trap including date of service. There will be a National Grid logo and an app that a new facilities manager can use to quickly get up-to-speed in learning about the condition of steam traps in his/her new building. Infrared images are also available. This will also provide the new facilities manager with instantaneous information about National Grid's energy efficiency programs. No incentive is available at this time but may be considered in the future.

EcoThermal Grease Filters

This is an emerging technology that incorporates an air to water heat exchanger into grease filters which fit into commercial kitchen exhaust hoods. In addition to exceeding UL grease collection requirements by 3.5 times, they also serve to pre-heat hot water. This further saves natural gas. The system captures and reuses waste heat that would otherwise be wasted to the outside. In 2016, the manufacturer partnered with the Company's vendors to perform demonstration projects in Rhode Island, Massachusetts and New York. As a result of this demo project, customers can expect energy savings and reduced cleaning costs to exceed $4,000 per

year. The average restaurant can save 2,000-3,500 Therms per year in gas as a result of the pre-heating of hot water. This results in an average CO_2 reduction of 18.6 metric tons per site.

EcoThermal Filters™ mentions National Grid incentives are available for Rhode Island commercial customers on their website. Filters fit into standard commercial kitchen hoods, making installation easy. Regular maintenance can be done by the restaurant's team and a deeper cleaning requires filters to be disconnected. Some restaurants hire a hood cleaning company for this work.

Removable Insulated Jackets for Big Steam Plants

For some of National Grid's largest customers, steam turbine insulation jackets improve both efficiency as well as safety in the plant. They are easily removed and replaced by any staff member. Both standard and custom sized jackets are available. One single turbine can save $9,500 in energy in a year. A heat loss reduction of 135 BTUs per square foot per hour can result from using the jackets. Touch temperature can be reduced from 750^0 F to 145^0 F, improving safety. This product has a five year guarantee.

Lighting Designer Incentives (LDI): Most lighting projects involve replacing old lighting fixtures with new more EE fixtures. This yields savings but leaves more savings untouched due to the lack of redesign. The LDI incentive goes directly to the lighting design team to fund their design and modeling efforts to achieve lighting energy savings while maintaining quality lighting design. The goal of this incentive is to have an early and deep impact on lighting projects, ensuring that energy efficiency is considered from the beginning and supported until the end of a project. The lighting designer becomes an EE champion, fighting for the best EE lighting for incentives. These lighting design solutions will have greater persistence because they are designed by professionals who have balanced the human needs of the project with the performance requirements of the lighting system, creating quality lighting designs that are "right-sized" for the project by being energy efficient. In 2017, the Company plans to streamline the Lighting Designer Incentive program requirements and will expand the qualifications for lighting designer to include architects and engineers who have 5 years of demonstrated lighting design projects.

Upstream Path: This is described in more details in section 6 below.

Initiatives specific to Retrofit Program

Specific initiatives are listed below within the retrofit portfolio that address specific and unique needs of the existing buildings upgrades:

1. Retro-Commissioning

As a result of the Company's experience with retro-commissioning to date, an initiative will be conducted in 2017 to stream line the existing process for customers to benefit from this service in a manner that is both timely and less costly than the way this service is currently offered. Five customers will be selected for this initiative from healthcare, office and education sectors. The buildings selected will contain a minimum of 50,000 square feet. Screening criteria will include whether or not they have an EMS; whether or not they have controls; and if they frequently receive complaints from occupants about being too hot or too cold. The intent is to look for customers that have the greatest need for this service and for National Grid to be able to learn from the experience. This involves having a retro-commissioning agent conduct a technical assistance (TA) study working with a controls vendor. Savings will be claimed for both electric and gas.

2. Boiler Tune-Up Initiative

In 2015 a natural gas boiler tune-up demonstration project began in Rhode Island. In 2016, this project became an initiative and modifications were made to the qualifying criteria which broadened the reach to more customers. It was determined that those customers who had previously completed parallel positioning but not O_2 trim could benefit from considerable savings if they had a tune-up. One of the things that can happen if a customer has parallel positioning but no O_2 trim is that the parallel positioning can drift over time. Previously, those customers who had completed both parallel positioning and O_2 trim were not eligible to participate in the boiler tune-up initiative. As a result of these modifications, in 2017, the Company expects increasing number of applications for this measure.

3. Strategic Energy Management Planning (SEMP)

The Strategic Energy Management Planning (SEMP) Initiative is available to National Grid's largest C&I customers who have the potential to go deeper with energy efficiency, and who have a level of in-house sophistication to make organizational changes to plan for multi-year energy planning. A Memorandum of Understanding (MOU) offers a way to document a commitment between the customer and the Company to work together to achieve mutually stated goals through specific actions that are tailored to the customer's facilities over a multi-year planning horizon. As such, an MOU (though non-binding in this case) can set the stage for achieving deeper and more comprehensive energy efficiency savings, and is more likely to succeed than a "one measure" or "one year" approach. Typically, MOUs include participation and a commitment by upper management, the establishment of specific, very aggressive energy efficiency saving targets, and measurement and verification strategies to document savings throughout the target facilities along with an incentive structure that meets the customer's financial criteria. This offering goes much beyond energy efficiency and into sustainability and branding support to the customer.

The Company currently has three SEMP MOUs in 2016 all of which will continue in 2017. One is a large university campus and the second is a hospital group comprising of RI's five largest hospitals. In the second quarter of 2016 the Company added an additional SEMP focused on State facilities (detailed above under Municipal and State Sector). The Company will continue to work with these customers to help achieve their MOU goals. In 2017 the Company will explore the opportunity for at least one additional SEMP partnerships with its large C&I customers.

4. Peak Load Reduction Strategies

The Company plans to pursue electric and gas savings with its customers that will result in peak load reductions in addition to annual kWh/Therm energy savings. In addition to exploring peak demand strategies with its SEMP and industrial customers where there are large pockets of savings, the Company will continue to pursue the following strategies for summer and/or winter peak reductions:

- Wireless temperature controls: These controls provide the benefits of large commercial HVAC equipment, especially roof-top units for small businesses. The Company will continue to create messaging around the benefits of these controls for electric and gas and how it has a direct response to the expectation of higher energy costs in winter and summer. Selectable settings and the ability to send system information directly to a computer or mobile device enables users to remotely manage multiple rooms and properties thereby improving energy efficiency and occupant comfort.

- Marketing campaign for best practice tips: This campaign, which was carried out in 2015 and 2016 will continue in 2017 as well. This consists of a list of best practices for reduction in electric and gas usage during winter and summer months, and could be distributed to all C&I customers during the winter of 2016 and summer of 2017.

- Pipe Insulation and steam trap surveys are already part of the Company's mix of measures that are offered to its customers. As part of the winter campaign both of these measures will be marketed through the Company's sales and marketing teams to reinforce the importance of these measures on the winter usage.

- Boiler Tune-Up: The boiler tune up initiative described above will further assist customers with winter peak reduction.

- Lighting and controls: Several initiatives and measures help reduce summer peak load through lighting specific measures.

- Demand controlled ventilation and energy recovery on HVAC units, both measures provided in the programs that save on peak reductions.

- Demand Response: The Company is pursuing a demonstration project to test DR capabilities (described in section below).

5. Products Offered Through "Upstream"

When the Company refers to an "Upstream" initiative it is referring to the practice of offering an incentive directly to a manufacturer or distributor (mainly distributors in Company initiatives) of efficient equipment instead of offering an incentive to the customer through an application form. This allows them to sell the product for less and make it more appealing to a potential customer. It also allows the customer to acquire this more efficient equipment without the burden of paperwork and waiting for reimbursement.

Upstream Lighting

National Grid's first, and flagship, Upstream initiative is formally known as "Bright Opportunities Rhode Island". This initiative was launched in February of 2012 with four types of LED and four types of fluorescent lamps. Today, the program includes a wide variety of LED lamps, small LED luminaires, and various sizes (1'x4', 2'x2', 2'x4') of recessed ambient LED luminares or "troffers." To date, it has achieved more than 70,000 net MWh in savings and will continue to play a major role in the Company's programs in 2017 and into the future due to the fact that:

- Moving products from downstream to Upstream removes customer-facing paperwork that the Company's customers have routinely indicated is a barrier to participation.

- Moving products from downstream to Upstream has shown major increases in volume and savings in the past. This volume and increased competition between many manufacturers and distributors drives the prices of luminaires down quickly and has given the Company opportunities to reduce incentives and make the initiative an even more cost efficient way to deliver lighting savings.

- Moving products from downstream to Upstream, especially in concert with Mass Save Program Administrators (PAs), tends to change the stocking pattern of distributors across the region which facilitates the transition from fluorescent or HID sources to more efficient and more easily controlled LEDs.

  Although the Company is constantly striving to deliver savings "deeper" than lighting, a rapid expansion to savings in lighting will have a positive effect (decreasing kW demand) in both winter and summer peak times due to the fact that commercial lighting is generally on during these times.

In 2017, National Grid will eliminate all fluorescent offerings in Upstream lighting. The entire initiative will be focused on LED lamps and luminaires.

In 2017, National Grid is seeing a lower volume of the type of LED lamps that were first introduced in the initiative come through the system. The Company believes that this is due to the fact that a substantial portion of this market has been converted to LED lamps and that it might be nearing a saturation point. Therefore, the Company will spend more time and incentive dollars focusing on how to increase the volume of 1x4, 2x2, 2x4 luminaires, especially those which offer built-in controls which will result in more savings.

National Grid will continue to offer incentives on linear LED replacements for T8 fluorescents, as there are places where this technology is appropriate. However, the Company feels that many customers would be better served by a new luminaire, especially those with built-in controls. The incentive structure in 2017 will reflect this.

Upstream HVAC

The success of the Upstream Lighting initiative encouraged National Grid to explore other areas where the Upstream model could be used successfully. After some research, the Company decided to issue a joint RFP with the Massachusetts Program Administrators (under the "Mass Save" umbrella) for a company to run an initiative that will encourage distributers to change stocking patterns and advocate for energy efficient Upstream Unitary HVAC and Heat Pumps up to 25 tons.

This initiative has slowly increased savings delivered to the Programs since its inception. This initiative is less dynamic than the Upstream lighting initiative, described above, as there are fewer manufacturers and less transparent pricing structures. As of Q3 of 2015, the Company and its partners EFI/CSG have enrolled all major manufacturers and have made inroads in understanding how this market works.

The contract with the current vendor ends on December 31, 2016. In July of 2016, the Company along with MA Program Administrators, issued a Request for Proposal (RFP) for this initiative. To date, the Company has received several interesting proposals, many with interesting new approaches. These new approaches, depending on how they are received, may increase participation and savings. At this time, it is not clear whether or not the vendor selection will be complete before this plan is filed.

*It is important to note that savings from this particular set of products will be calculated from new construction not retrofit baselines.

In addition, the Company will introduce a new Upstream initiative that will offer ECM circulator pumps under 3HP in Q1 of 2017. National Grid's research indicates potential exists in several key market segments. It is highly likely that the firm chosen to operate the Upstream HVAC initiative will also operate this initiative.

Upstream Gas Equipment

In Q4 2015 National Grid and the MA Program Administrators launched the first product in the new Gas Upstream Program. By partnering with local water heating distributors, the Company has collaboratively promoted the sale of high-efficiency water heating equipment. The Company leveraged the commercial water heater distribution network by upselling and stocking high efficiency equipment to influence as many qualifying commercial water heater sales as possible.

As of July 2016, the initiative had 25 active distributors in both MA and RI representing 125+ branches. The success of this path has been quite remarkable. If the success through the second quarter is maintained throughout 2016, the initiative will have produced 768% of the savings coming through the downstream path in 2014 (baseline year).

The initiative currently incents four different types of water heating equipment - Indirect, Storage, Tankless, and Volume.

In 2017, the Company will continue to work closely with its partner Energy Solutions to increase unit throughput and make the initiative more cost efficient wherever possible.

*It is important to note that savings from this particular product will be calculated from new construction not retrofit baselines.

Upstream Kitchen Equipment (Electric and Gas)

In 2017, the Company and the MA Program Administrators will be launching a Point of Sale (POS) initiative for all electric and gas kitchen equipment. It is similar, but not the same as, current Upstream offerings in structure. The customer will receive an instant rebate at the point of sale, which, for the first year, will be equal to the current prescriptive incentive, and the equipment wholesaler will receive a small spiff for their efforts in getting the customer to upgrade to a more efficient product. This differs from the way the Company has pursued Upstream paths in the past in that it will be leaving the current downstream path open so that the customer has maximum flexibility. This has proven successful in other jurisdictions. A protocol has already been established to prevent savings being counted and dollars being spent in two places. National Grid expects to see a considerable lift in efficient kitchen equipment flowing through the system.

6. Combined Heat and Power Initiative

A combined heat and power (CHP) facility is "equipment used to produce electric energy and forms of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes, through the sequential use of energy."[4]

Since 2012, the CHP provisions of the Least Cost Procurement law in R.I.G.L. §39-1-27.7[5] have required the Company to document the support for the installation and investment in clean and efficient CHP annually in its energy efficiency program plan by including a plan for identifying and recruiting qualified CHP projects, incentive levels, contract terms and guidelines, and achievable megawatt targets.[6]

For 2017, the Company will continue to offer a Combined Heat and Power (CHP) incentive. In 2017, the Company's emphasis will be on increasing the support for qualifying efficient CHP projects through the energy efficiency programs, as intended by the legislation. Because of the high capital cost and technical requirements of installing CHP, there is a very long lead time for a successful installation. With small numbers of projects and wide ranges of possible project sizes, the Company anticipates substantial variability in MW realized in any given year. Noting this, for 2017, the Company is proposing a target of 1.5 MW of installed capacity that corresponds to 11,250 MWh of savings. For 2017, the Company has set a goal of three installations in Rhode Island and commitment to the initiation of at least two additional projects for future years.

To qualify for a CHP energy efficiency incentive, a proposed project must meet the following conditions:

- Host customers must be in the franchise service area of the Company.
- Proposed systems must either be (i) thermal leading and sized so the recoverable heat can be used to offset other facility thermal loads and generate electricity as a by-product, or (ii) using waste energy or waste heat to generate electricity.
- Both new construction and retrofit installations are eligible; in either case, the baseline system must be carefully documented.
- The overall minimum total system efficiency of the proposed CHP units must be 55% or greater[7]. System efficiency is calculated as Annual Useful Energy/Annual Natural Gas Input where

[4] CFR Title 18, Part 292, Sub-Part A, 292.101 – Definitions
[5] See R.I.G.L. § 39-1-27.7(c) (6) (ii) through (iv); For the legislative history, see P.L. 2012, Ch. 363, S2792 Sub A (Enacted June 21, 2012).
[6] See R.I.G.L. § 39-1-27.7(c) (6) (iii).
[7] The RI DEM's Air Quality Regulations (http://www.dem.ri.gov/pubs/regs/regs/air/air43_12.pdf; Page 11) set a minimum system design efficiency of 55% for CHP to be eligible to apply for Emission Credits. As noted in the incentive levels section below, a higher energy efficiency incentive is available for systems with efficiencies of 60% or greater.

  - Annual useful energy = Net Annual kWh*3,413/100,000 + utilized thermal output (Therms)
  - Annual natural gas input = CHP gas input in Therms (HHV)
- The equipment to generate electricity may be an internal combustion engine, gas turbine engine, steam turbine, back pressure turbine, or fuel cell and the facility will capture waste heat for use in the facility.

Wasted energy systems and back pressure or extraction turbines can qualify. For these facilities to qualify the following conditions must be met; because these systems are designed to take advantage of existing on site wasted energy or inefficient processes, there is no minimum total system efficiency requirement.

- Host customers must be in the franchise service area of the Company,
- All thermal and electric output of the CHP facility should be used on site,
- While it is expected that most of these applications will be retrofit, both new construction and retrofit installations are eligible; in either case, baseline system must be carefully documented,
- The project must pass cost effectiveness screening.

The Company will undertake the following steps to support qualified CHP projects.

Identification and Recruitment of Qualified CHP Projects

The Company currently works with vendors and customers to identify CHP opportunities at customer locations. The Company promotes CHP systems and outlines the process for qualification and implementation of CHP facilities through the Company's energy efficiency programs. The Company has sales and technical staff who are primary points of contact for customers and vendors with potential CHP projects. The Company will continue to communicate criteria for CHP assessment and will communicate to vendors so that their presentations to customers will be more consistent with Company technical assistance requirements.

Scoping Study/Qualification

The Company will offer technical assistance on CHP projects beginning with a preliminary scoping of a potential site. This scoping will be based on an evaluation of:

- Monthly (or hourly, where available) electric, gas, and other fuel usage
- All site-specific forms of thermal energy end uses
- Coincidence of electric and thermal loads
- Proposed project cost

This scoping will determine if further study of the site appears favorable, i.e., provides CHP operating hours and load factors that would be an appropriate application of CHP.

Technical Assistance Study

Assuming a favorable screening, National Grid will co-fund a TA study of CHP with the customer. The TA study will be performed by an independent, qualified engineering firm. This study is to measure thermal loads, appropriate CHP size, compile a budget cost estimate, and identify potential barriers to the technology, etc. National Grid will fund 50% of the cost of any TA study conducted by a preferred vendor selected by the Company, and up to 50% of the TA for other qualifying independent engineering firms. Any TA study by a CHP vendor or its representative which fulfills the CHP TA requirements may be accepted, though no co-funding will be provided. The TA study must be completed, submitted, and approved by the Company prior to implementation.

The TA study must include an assessment of the likely on-peak kW reduction from the facility given its nameplate rating, the net facility output, projected availability based on anticipated site-specific operating characteristics, and performance data on other similar units. (On-peak kW reduction = Net Output x Availability x % Loaded.) This kW load reduction should be used in the benefit-cost screening.

All TA studies should include not just an analysis of the CHP system, but also an analysis of load optimization and thermal and electric energy efficiency opportunities. These opportunities themselves will be eligible for energy efficiency incentives and will help make sure that the CHP facility is correctly sized for the facility's needs and will avoid creating a disincentive for future load reduction at the site. As indicated below, a larger incentive is available for CHP projects that include the implementation of energy efficiency measures at the host facility.

Cost Effectiveness

The screening for cost effectiveness specific to CHP is included in the Total Resource Cost Test Description included as Attachment 4.

Incentive Levels

If a project has been shown to be cost effective, it will be eligible for an incentive. Incentives will be determined following cost effectiveness screening in consultation with National Grid personnel. The following rules will apply to all CHP projects (regardless of size) in the determination of the incentive. However, the amount of incentive the Company is willing to offer and commit to the customer could depend upon the amount of funds that are budgeted or remaining in the budget of the energy efficiency program.

- For cost effective CHP projects, the target energy efficiency installation incentive ("installation incentive") in 2017 is $900 per net kW, where net is nameplate kW output minus CHP auxiliary kW. For CHP projects with efficiencies of 60% or greater, the target installation incentive in 2017 is $1,000 per net kW. Wasted energy, back pressure turbines, and extraction turbines are eligible for incentives of $900/kW.

- For cost effective CHP projects where the host customer also commits to implementing energy efficiency measures representing at least 5% of site energy use or the maximum load reduction identified by a TA Study, whichever is less,[8] the maximum installation incentive in 2017 is up to $1,125 per net kW, and the CHP sizing must incorporate the load reduction. For CHP projects with efficiencies of 60% or greater and that have similar energy efficiency participation, the maximum installation incentive in 2017 is up to $1,250 per net kW. A customer may be treated as having made this commitment to energy efficiency if it has made investments to achieve similar load reductions through energy efficiency within the previous five years.

- All CHP projects are also eligible to receive other incentives, such as the Advanced Gas Technology (AGT) incentive, subject to the incentive package cap described below.

- CHP facilities greater than 1 net MW may be offered an additional performance incentive, as further provided in the section entitled "Special Considerations for Large CHP Systems," below.

- The CHP system costs must include: the cost of all system, auxiliary, and interconnection costs; and CHP maintenance. If the system is receiving a tax credit, it will be treated as a credit against the cost of the CHP project.

- The CHP incentive package cap from the Company will be 70% of the total project cost inclusive of the installation incentive, incentives related to gas service, present value of any performance incentive, system reliability procurement incentive, and any other incentives related to the transaction. For new construction installations, the incentive cap will be 70% of the incremental cost difference between the cost of what would have been done absent the CHP project and the cost of the CHP project.

- Retainage of 20% of the energy efficiency incentive payment will be held until commissioning is completed.

[8] If CHP facility sizing is determined by electric load (or not constrained by either electric or thermal load), the requirement will be 5% of electric usage; if the facility sizing is determined by thermal load, the requirement will be 5% of thermal energy usage. The energy efficiency measures will themselves be eligible for incentives, and are not part of the CHP incentive package cap described below.

Other Contract Terms and Guidelines

In order to ensure proper operation of the CHP facility and persistence of energy savings, the following terms and guidelines will be required:

- Minimum requirements document. As part of the TA study, a minimum requirements document ("MRD") will be developed. This MRD will contain engineering hardware and operational specifications that directly affect the savings estimates developed in the TA study. Compliance with the MRD will be necessary to receive rebate payments.

- All systems will require electric, thermal and gas metering for commissioning and monitoring of system efficiencies. Metering hardware and data collection services may be provided at little or no cost to the customer.

- The project must be commissioned. Commissioning is a process following installation whereby a third party verifies that the project is installed and operating as detailed in the TA study and MRD.

- The customer must sign and produce a contract for O&M services for a period of years through the first planned major overhaul of the CHP unit. On-going O&M contracts for a minimum of ten (10) years from project commissioning are recommended.

- The customer must apply for interconnection service as soon as practical and not operate the unit until they receive the authorization to interconnect from the Company. While there may be site-specific interconnection considerations for particular projects, please see the attached link for information on interconnection: http://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.asphttp://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.asphttp://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.asp.

- As noted in section IV.A.1 of EE Program Plan, kW-demand savings achieved via the electric energy efficiency programs, including CHP, will continue to be reported by the Company to ISO-NE as Other Demand Resources ("ODR") and the revenue generated will be used to fund future energy efficiency projects through the Company's programs.

Delivery Service Tariffs Applicable to CHP Installations

Customers receiving an incentive payment for installation of CHP will be billed for delivery service charges on the appropriate general service tariff. The Company's general service tariffs, Rates G-02, G-32 and G-62, include a CHP Minimum Demand Provision for those CHP installations that receive an energy efficiency incentive pursuant to this Plan. For Customers subject to this CHP Minimum Demand Provision, the monthly Demand will be the greater of a)

the Demand as normally defined under the tariff provisions; or b) the Minimum Demand, which shall be 50% of the greatest fifteen-minute reading from the Customer's generation meter(s) as measured in kilowatts during the month. The Customer Charge, Transmission Demand Charge, all per kWh charges and any other applicable charges and credits will be in addition to the Minimum Demand Charge. This rate treatment is designed to mitigate the cross-subsidies from other customers in the same rate class. The Company believes it is very important to assure that a customer who is receiving incentives through the energy efficiency program continues to pay a fair share of the costs of the distribution system upon which the customer will continue to rely when the CHP unit is off-line.

Special Considerations for Large CHP Projects: A project that is greater than 1 MW of net nameplate capacity shall be defined as a "Large CHP Project" and may be eligible for special considerations that support the development of CHP, while accounting for its unique characteristics.

Qualification:

The cost of the project will be reviewed by a design/build or general contractor experienced with CHP projects and revised as necessary.

Incentive and additional terms and conditions:

If a Large CHP Project passes the benefit cost test described in Attachment 5, the appropriate incentive will be determined, based on the guidelines for all CHP projects set forth in the section entitled "Incentive Levels," above.

An additional performance-based energy efficiency incentive, capped at $20/kW-year ($1.66/kW-month) for a period of up to ten years, will be offered as part of the incentive package for any project greater than 1 net MW. No payments will be made until the unit is in operation and provides demonstrated load reduction, and will be made semi-annually based on actual metered load reduction. Load reduction performance will be based on the net daily metered kW output of the system during ISO-New England's on-peak periods averaged over each six month period.

Performance incentives will be subject to budget limitations and, in all cases, will be subject to the 70% total project cost cap applicable to all CHP projects set forth in the section entitled "Incentive Levels," above. The total incentive package will include any incentives related to gas service, and the present value of the above-described performance incentive.

The customer will have to repay a portion of the incentive to the Company if the project is abandoned, removed from the premises, sold, or otherwise no longer utilized as the primary source of heat and electricity by the customer, within 10 years from the date of final incentive

payment authorization. The repayment will be the energy efficiency installation incentive times the number of years remaining until the required ten years of service divided by ten. Other incentives, such as any Advanced Gas Technologies (AGT) incentives, may also have similar reclaim provisions.

Options for CHP proposal that fails cost effectiveness testing

If a CHP project does not pass the benefit-cost test, the Company will work with the customer to develop other solutions that may still support the CHP facility. Such other solutions may include one or all of the following:

- Re-analyzing the optimal size of the CHP unit, or the number of generators. A different sized CHP unit might provide better efficiencies and pass the benefit cost test.

- Identifying other load reduction opportunities at the facility. Benefits can be garnered from load reduction in lieu of achieving that load reduction through CHP.

Targeted Outreach and Support for Potential CHP Customers: The Company believes that significant savings can be generated with this technology in the coming years. The Company is focused on developing a pipeline of projects for small, medium and large customers. In addition to having a specific sales point person for CHP projects, the Company has a CHP program manager who helps customers navigate the technical and procedural aspects of bringing a CHP unit online. The Company also works with a TA vendor that provides assistance in identifying and executing CHP projects. In addition, the Company works with CHP vendors to offer RI customers smaller CHP units where installation and operations are turn-key. Furthermore, in 2016, the Company introduced a CHP manual to assist customers who are deciding if CHP is an option for their facilities. Other strategies that will enhance CHP acceptance will also be considered, such as: preparing and distributing case studies, providing plant operator training, and providing easier customer access to CHP unit performance data.

Retrofit Program Demonstration/R&D Projects

1. Demand Response: National Grid has proposed a 5 MW demand response (DR) demonstration project as part of its 2017 Rhode Island Energy Efficiency plan. National Grid would like to reduce distribution costs within its territory, thereby reducing electricity costs for its electric customers (both on default service and with competitive suppliers) while enhancing reliability.

National Grid does not currently have specific distribution constraints on its system in Rhode Island that it is looking to address with this DR demonstration project. The Company would like to test its systems as well as customer interest by commencing a program and calling simulated

DR events during the summer season. Events will be triggered based on the day-ahead system load forecast for National Grid's RI territory. The targeted number of event hours is 20, with each event having a 4-hour maximum duration. Events will be on weekdays, excluding national holidays, in the months of June, July, August, and September. The electric transmission and distribution systems in Rhode Island have a higher peak in the summer than the winter. So the summer peak is driving the size of the systems and there are more benefits to a summer demand reduction program than a winter reduction program. However, there would also be benefits to having a winter demand reduction program in the future, if it proves cost effective.

The Company proposes to offer an incentive, which could be a combination of $/kW and $/kWh elements for the 2017/18 summer program season This determined value represents a cost-effective level that will attract participants and attain the goal of 5 MW of DR within its territory.

Aggregators will submit customer information to the Company on a first-come first-serve basis until the 5 MW limit is reached. Aggregators must provide a realistic estimate of customer DR potential so as not to overinflate the values and fill the limit prematurely. Customers are required to have a utility interval meter in order to participate. ISO-NE FCM DR participants are eligible for this program. However, any DR asset receiving program incentives must be 'new' DR assets. Any DR asset currently bid into the FCM or any DR asset already under contract with an aggregator will not be eligible.

Payments would be made after the summer season ends. They would be based on average performance over all seasonal events and tests. No performance penalties are expected to be levied in the program. National Grid will utilize the ISO-NE Customer Baseline to measure performance based on interval meter data. ISO-NE Forward Capacity Market event/test days will be excluded from baseline calculations as reported by the aggregators to National Grid. Payments will be based on the aggregator's portfolio performance. Incentive funds will be given directly to the aggregator.

2. Energy Efficiency upgrades in pumping systems for water/wastewater plants

This demonstration project will be an extension of a similar project currently in progress in MA. The objective is to evaluate energy efficiency and non-energy benefits related to pumping operations in water and wastewater plants in Rhode Island, otherwise also known as Pumping Systems Optimization. This Demo project will investigate and persuade plant operators to investigate restoration of pump efficiency to design levels as well investigate incremental energy savings attributable to application of wear resistant pump coatings to maintain persistence of energy savings over a longer period of time.

This demo project is intended to work with three prescreened sites to measure current operating efficiency on pumps systems equal or greater than 40 HP, compare to original design

pump efficiency specifications, and to quantify energy efficiency improvement through rebuilding pumps to design specifications along with coating pump internal components with a wear resistance coating. The system assessment will include looking for additional energy efficiency opportunities such as pump/motor sizing based on measured values of pump flow, pressure and power, replacing throttle valves with VFD drives on pumps and any piping related issues. Pre and post system assessment to include measurement of power, flow and head will be completed to quantify and confirm gains in energy efficiency by restoring mechanical condition of pump to original specifications supplemented by performance coatings to extend and maintain persistence of energy savings over a longer period of time.

3. Behavior change through education of small/medium plant personnel

The main objective here is to give smaller plants cost effective access to independent air systems specialist to facilitate comprehensive compressed air systems assessment. The Company will develop technology and training materials needed to facilitate this objective through web based training materials and tools combined with remote data collection process and support to interested customers. The intent of this effort is to drive customers to the Company's current compressed air offerings. Training is one component and the other is to install metering for flow, power and pressure and implement any efficiency improvements working with the customer.

Benefits: Comprehensive systems assessments by independent compressed air system specialists are not easily affordable for small to medium size plants where total annual compressed energy usage is $150,000 or less. This pilot will aim to educate plant personnel in the knowledge and tools required to conduct self-assessments, provide training and access to needed instrumentation and facilitate remote data collection and support to identify and implement energy efficiency measures. Completion of both phases of this pilot is expected to result in development of a proven process to assist small and medium size plants with energy efficiency improvements related to compressed air systems.

4. **Secure Lighting Spec (SLS)** is based upon a mutual agreement with Lighting Manufacturer Representatives (LMR) to engineer and deliver lighting & controls packages that exceed energy code by 15% or more. The goals of the Secure Lighting Spec are:

    a. Establish a special partnership between National Grid and Lighting Manufactures Representatives (LMR) to participate in targeted code-based lighting incentive programs.
    b. Utilize the LMR applications engineers to implement best practice lighting design and photometric modeling for deep energy savings and qualitative lighting outcomes for the Company's customers and building occupants, while meeting IES standards.

c. Achieve substantial energy savings by utilizing the lighting engineering capabilities of the LMR. Savings are based on projects achieving 15% or greater energy savings beyond what is required by the required energy code.
d. Incorporate energy efficiency incentive estimates early in project quotes to clients & customers through the LMR pre-approved product portfolio.
e. Reduce the lighting system initial costs through advanced lighting engineering, energy efficiency incentives and operating costs for customers and clients for projects that meet energy efficiency goals.

5. **Lighting as a service**: Lighting as a Service (LaaS) is a new business model that the Company plans to pilot in 2017 to deliver the best lighting equipment and ongoing commissioning for system optimization through a subscription based service. The goals of LaaS are: To create a leased equipment business model with zero capital expense that eliminates initial cost barriers for energy efficiency lighting projects. LaaS contracts will allow customers to reap all of the benefits of LED technology, without getting bogged down in the detail of owning and operating the lighting asset. Since LaaS offers a full turnkey solution, this type of service partner can supply the design, financing, installation, maintenance, monitoring and responsive performance adjustments (such as color tuning and dimming.) Benefits of LaaS are:

a. It enables real-time energy monitoring for evaluation to confirm savings.
b. It works with demand response by identifying lighting that can be reduced during DR events.
c. It works best with sophisticated lighting technology that can be optimized and maintained through this service contract. It works with all code-based lighting incentive programs, and is compatible with PoE systems with a higher density of sensors and data.
d. It is an integrated program approach, i.e., a program that offers energy audits and energy efficiency solutions for a specific building type with prearranged financing and retrofit lighting system options.
e. It involves a detailed analysis of facilities including controls sequence of operations, building set-points, occupancy schedules and operation and maintenance protocols. Once the analysis is complete, recommended optimization measures and an ongoing plan for maintenance and operator training in implemented. This will increase energy savings persistence and customer satisfaction.

Small Business Direct Install Program

Overview

The Small Business Direct Install Program (SMB/DI Program) provides turnkey services to commercial and industrial customers with an average monthly demand of less than or equal to 200kW. There is no upper limit of gas consumption that disqualifies a customer from receiving the gas measures offered by the SMB/DI program.

The Company has delivered this program for more than two decades through a local vendor, who is known as the "Regional Program Administrator" or "RPA". The RPA is responsible for program management, data entry, and quality control. The RPA is located in Rhode Island, employing local staff, local electricians and energy efficiency lighting materials procured through a competitive bid process. As of 2011, customers served by natural gas are also eligible for direct installation of natural gas energy efficiency measures.

Customers are provided turnkey services consisting of:

- An Energy Audit
- Direct Installation of Measures
- Company incentive contribution of 70% of total project cost
- On-bill repayment (OBR) for customers' 30% share of the project costs, and up to 60 months at zero (0) percent interest or a lump sum payment with a 15% discount, resulting in most customers' projects having a positive cash flow when they choose the OBR repayment option.

Since its inception when the SMB/DI Program focused primarily on lighting and refrigeration direct install measures, it has broadened its scope to include identifying:

- Cost-effective "custom" electric and gas measures, such as Energy Management Systems (EMS)
- Time dependent opportunities such as replacing roof top HVAC units and heating systems
- Participation in residential programs where the building may have both commercial and residential properties in the same building.

As noted previously, the Company is continuously working with its engineers and technical assistance experts to try and move as many measures from the custom category to prescriptive or "custom express" to streamline the process for customers as much as possible. This should encourage the vendor and the customer to install these measures more frequently and reduce the technical costs of the program.

In addition to cost-effective custom and time dependent measures mentioned above, the SMB/DI Program offers incentives on the following measures:

- LED lamps and luminaires
- Occupancy sensors and controls
- Energy Management Systems (EMS)
- Thermostats
- Insulation
- Hot water reset
- Low flow pre-rinse spray valves
- Refrigeration measures such as evaporator fan controls, efficient evaporator fan motors, automatic door closers and door heater control devices for walk-in coolers
- Boiler reset control
- Pipe Insulation

Offering Changes

Overall, the Company has a strong foundation of experience delivering this program enabling it to meet program goals and to continue to develop and implement new products and services.

As a result of the Company's increased move to vertical market sectors to serve customers better, the following segments are no longer included in the small business segment:

- K-12 Schools
- National Chain Retail Locations and Restaurants
- Small Grocery Stores (not including convenience)

The Company fully acknowledges that this will affect the ability of the SMB/DI vendor to reach goals on par with previous years and has adjusted their goals accordingly for 2017. The movement to vertical markets from the SMB/DI program will also impact the level of participation in 2017. The Company is planning to serve more SMB/DI customers in 2017 compared to 2016, particularly through the Upstream Lighting, Upstream Kitchen Equipment, and Upstream HVAC initiatives, but these participants will be reflected in the other C&I programs.

Commercial & Industrial Marketing

In 2016, the Company continued to build awareness of, and increase participation in, its energy saving offerings for Rhode Island's business customers. The Company continues to track awareness levels of its energy saving offerings through its internal research study, the "Brand, Image and Relationship" (BIR) tracker. To gauge awareness levels, the BIR surveys commercial customers monthly asking questions related to Energy Efficiency (EE) Familiarity. The Company compares these survey results against its calendar and fiscal year EE Familiarity goals. National Grid has consistently scored above its stretch goal for familiarity in 2016. The Company will continue to measure awareness levels in 2017.

In addition, since November of 2015, the Company has included "Communication Satisfaction" as a core metric - measuring six individual criteria to better understand how the Company can improve its Communications with business customers. Commercial results have exceeded the overall stretch goal, with increasing statistical gains on most criteria measurements. The "Creating Messages That Get Attention" question is presently at the highest point since National Grid started tracking this metric. This is another way the Company measures the impact and success of its marketing and communication efforts in 2017.

In 2016, National Grid implemented a robust strategic marketing plan, which utilizes both EE awareness channels as well as channels that targeted several priority vertical markets. The 2015 audience segmentation and vertical targeting has proven successful, so the Company built on this success by continuing to create non-energy benefit focused communications by industry and job type. National Grid focuses on the Manufacturing, Retail, Healthcare, Education, Hospitality, Gas Stations, Convenience Stores, Independently Owned Grocers, and Real Estate Investors/Commercial Building Owners markets.

The 2016 commercial marketing plan relies on tested, proven tactics such as e-mail, case studies, content marketing (articles and white papers), print (business sections, trade journals, association publications, etc.), digital (native, paid search, banners) and mobile. In addition to proven tactics, new tactics were tested including Pandora radio, infographics, LinkedIn sponsored updates and more. In 2017, the Company will continue to use channels that were successful, test new channels and expand its priority markets to include nursing homes, commercial real estate, and restaurants. The Company will also highlight new gas technologies as well as support and build awareness of the state's infrastructure bank.

In June 2016, the Company also launched a new advertising campaign targeted to commercial and industrial customers called "Business on the Grid". The new campaign was developed using extensive customer research. The research showed the campaign scored above ads from other popular well-known companies for getting customers' attention, brand recognition and

motivation. The "Business on the Grid" campaign is about connecting. It focuses on customer benefits and connects energy efficiency to their daily lives through storytelling, demonstrating the expected benefits (energy and money savings) as well as the unexpected benefits, such as profitability, productivity and employee health and well-being. The campaign simplifies customers' actions to obtain EE benefits and begins to redefine "the grid" as the energy delivery system of the future. The "Business on the Grid" campaign will continue to be utilized through 2017 and will be seen in a variety of EE advertising including print ads, digital ads, email communications, and social media.

The Company's annual Customer & Partner Energy Efficiency Summit (EE Summit) has helped cement its relationships with its largest customers. The EE Summit has been held at Gillette Stadium in Foxboro, MA since 2014. The EE Summit exemplifies the Company's customer focused philosophy, providing solutions that break through its customers' pain points and roadblocks. The summit's goal is to make the energy solutions the Company offers more accessible and easier to implement for its customers. It's also an opportunity for the Company to build personal relationships with its customers, sales teams and vendors. The Summit includes vendor partners and acclaimed speakers on teamwork, problem solving, sustainability, and innovative energy approaches. The ongoing theme of *Appreciate, Collaborate & Innovate* has become a north star for the event, spurring ongoing improvements in the Company's customers' event experiences. The 2015 Summit surpassed 2014 attendance by thirty percent and received high scores in a post-summit survey. The Company's 2016 EE Summit will be held on October 13, 2016. A date for the 2017 Summit has not yet been planned.

To enhance customer marketing, the Company's trade ally marketing aligns professionals who either influence or implement energy decisions for our mutual customers who are potential participants in National Grid's energy savings programs and solutions. These professionals include distributors, architects, builders, construction managers, contractors (HVAC, mechanical, electrical) and installers (electricians, plumbers). Marketing for new construction targets design professionals such as architects, engineers, construction managers (i.e. design build firms) and real estate developers (i.e. REIT). For lighting professionals (i.e. designers, distributors, manufacturer representatives and installation contractors), the Company targets commercial office space rehab fit-outs (i.e. commercial leased space upgrades) to the design professional and lighting upgrades to the lighting supply chain (distributors and manufacturer representatives) and installation contractor audience. HVAC contractors and professionals are targeted for equipment replacement, upgrade and maintenance opportunity. All of these contractors and professionals have an advisory role to the ultimate customer depending on the scope and scale of the project.

National Grid also has monthly newsletters serving architects and engineers (the design community), electrical and energy professionals (contractors, consulting energy professionals

and engineers who primarily focus on retrofit construction) and HVAC professionals and contractors.

National Grid's goals are to increase trade awareness, engagement and satisfaction with Rhode Island energy efficiency opportunities and to promote innovation to capture untapped savings for commercial, industrial, institutional and residential market segments. The types of projects include new construction and retrofit; but the Company also looks for ways to develop opportunities for system level savings and integration. Ultimately, National Grid's trade ally program promotes cost and operating efficiency for its electric and gas customers throughout Rhode Island.

For example, National Grid continues to partner with an external vendor to offer educational seminars to trade professionals on changing RI energy codes for new construction/retrofit; additional dates are being considered for 2017. The Company recently updated its New Construction Services participation guide to National Grid incentives, assistance, and training support for energy efficient, high-performance commercial, industrial, and institutional buildings. The Company recently introduced a trade ally website to serve as an organizing marketing framework to deliver fast, easy access to National Grid information relevant to trade professionals; the Company will continue to enhance this Trade-specific website in 2017. In addition to a print/digital trade advertising schedule to create Trade awareness and qualify interest in National Grid Trade energy efficiency (EE) programs and services, the Company also regularly offers a range of technical webinars. These increase Trade EE awareness, engagement and penetration. They also create a platform that helps extend EE conversations post-webinar. Finally, the Company provides the internal sales staff with marketing support, including case studies, program collateral and technical marketing pieces to enable discussions with customers on energy efficiency solutions.

Appendix 1

Sample list of custom measures in the energy efficiency program

Building envelope measures

- Fenestration
- Insulation

Laundry systems

- Polymer bead systems
- Ozone systems

Commercial kitchen measures

- Large dishwashing systems
- Heat recovery for water heating from
    - Cooking surface exhaust
    - Large refrigeration

Manufacturing

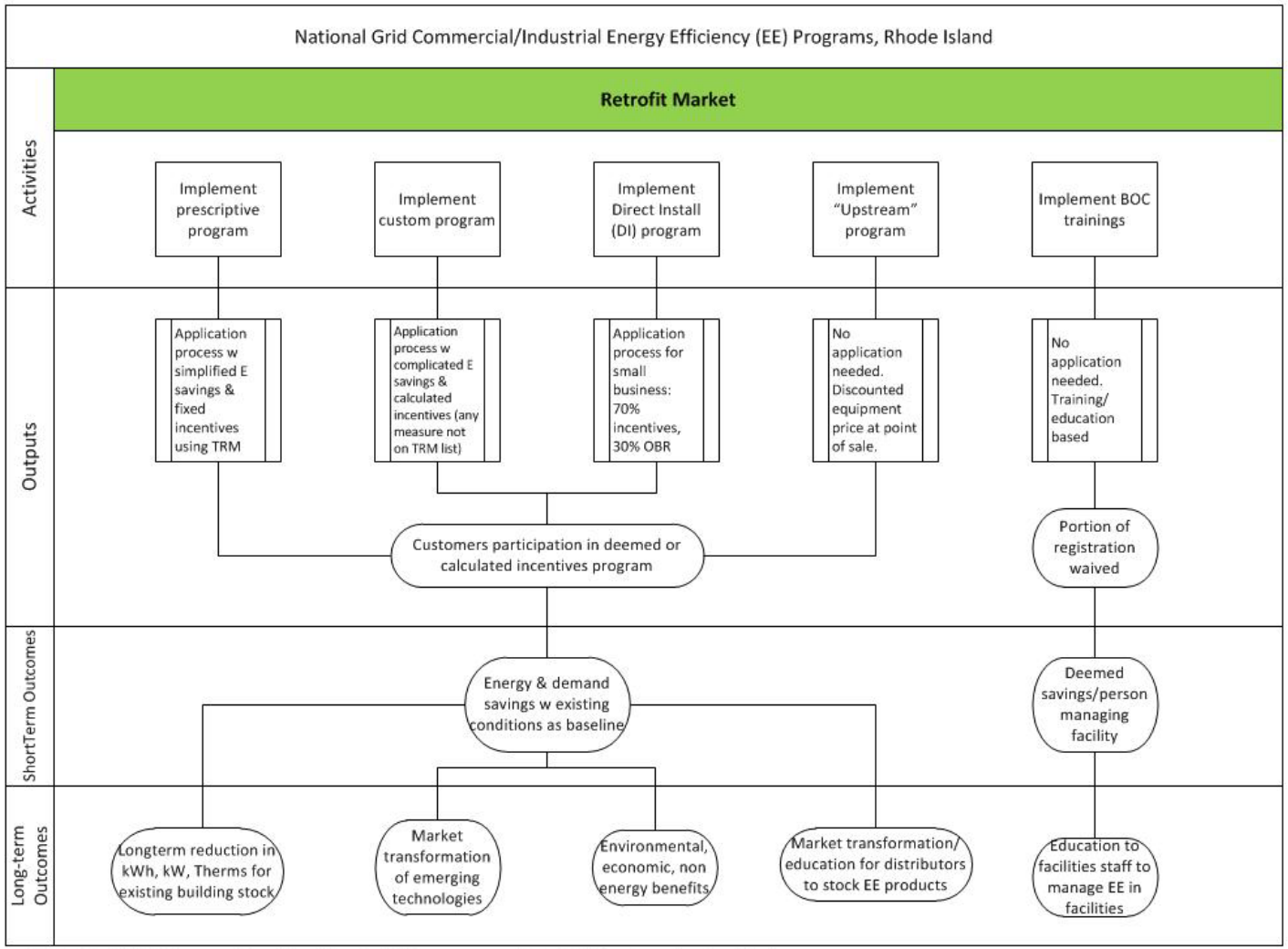
- Process improvements
- Energy efficient production equipment
- Specialized lighting
- Compressed air

HVAC

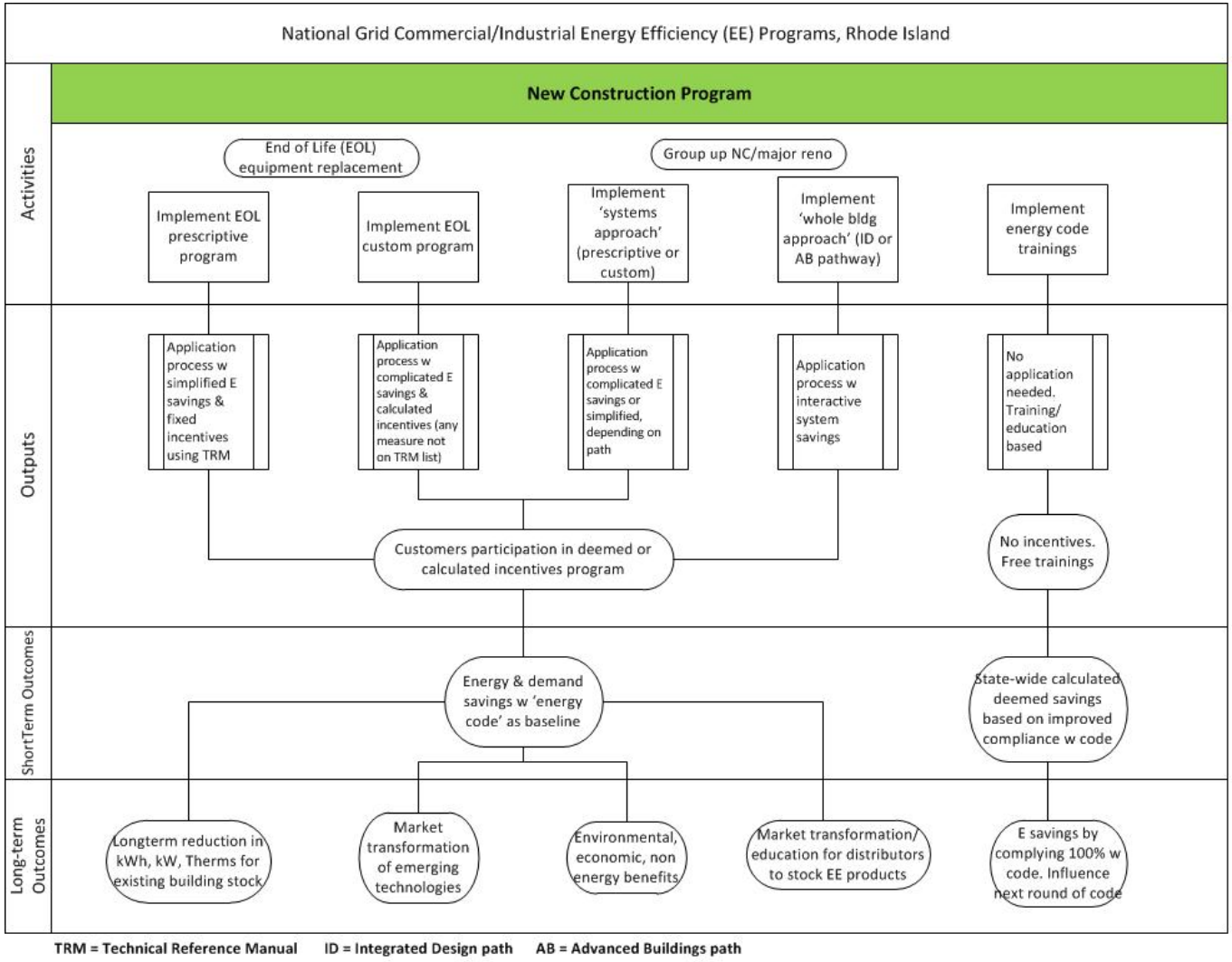
- Variable refrigerant flow systems
- Energy recovery ventilation (ERV)
- Air source and water source gas engine driven heat pumps
- Smart HVAC monitoring and control systems

Dry Smart gas dryers

Appendix 2: Retrofit Logic Model



Appendix 3: New Construction Logic Model



Appendix 4: Subprogram and Measure Savings Goals and Incentives

Electric Subprogram Net Savings Goals and Incentive Descriptions

Electric Programs			
Program	**Subprogram**	**Annual kWh Goal**	**Incentive**
Large Commercial New Construction	CAIR	891,416	Typically up to 75% of Incremental Cost
	Upstream HVAC	113,890	
	Custom	6,135,751	
	Lighting	1,830,847	
	VSD	439,309	
	C&I Codes	4,768,600	
	MPS	89,875	
Large Commercial Retrofit	Custom	15,978,743	Typically up to 50% of Project Cost
	HVAC	937,941	
	Lighting	9,027,331	
	VSD	2,543,188	
	CHP	10,548,563	
	Upstream Lighting	28,370,230	
	Street Lighting	10,204,700	
Small Business Direct Install	SCI	12,136,370	70% of Project Cost 30% Financed

Gas Program Measure Group Description with Quantity and Rebate Levels

Gas Programs			
Program	**Measure**	**MMBtus**	**Rebate Level**
Large Commercial New Construction	Boiler95	873	$ 1,500
	CODES AND STANDARDS	5,000	$ 63,000
	COMBO COND BOIL/WTR HTR 90+	309	$ 1,500
	COND UNIT HEATER 151-400 MBH	128	$ 750
	Condensing boiler <= 300 mbh	250	$ 1,500
	Condensing boiler 1000-1700 mbh	619	$ 7,500
	Condensing boiler 1701+ mbh	1,084	$ 10,000
	Condensing boiler 300-499 mbh	513	$ 2,000
	Condensing boiler 500-999 mbh	943	$ 4,000
	COOKING-COMBO OVEN 1	208	$ 1,000
	COOKING-CONVECTION OVEN 1	577	$ 1,000
	COOKING-CONVEYOR OVEN 1	53	$ 1,000
	COOKING-FRYER-1000	1,104	$ 1,000
	COOKING-STEAMER-1000	134	$ 1,000
	Furnace95ECM	68	$ 500
	Furnace97ECM	25	$ 800
	INFRARED HEATER - LOW INT	188	$ 750
	WATER HEATER TANK 0.67 EF	347	$ 152
	Water Heating Boiler - 85% TE	28	$ 152
	Water Heating Boiler - 92% TE	69	$ 152
	COMBO COND BOIL/WTR HTR 95+	4,673	$ 152
	COND WATER HEATER 90%MIN 75-800	3,387	$ 152
	Custom	32,936	Up to 75% of Total Resource Cost
Large Commercial Retrofi	BOILER RESET MULTI-STAGE	67	$ 225
	Builder Operator Certification	1,336	$ 518
	LF_SHWR_HD_1.75_GPM_DI	490	$ 200
	Pre Rinse Spray Valve	513	$ 25
	STEAM TRAPS	28,611	$ 50
	THERMOSTAT	30	$ 25
	WiFi Thermostat - cooling and htg	653	$ 100
	WiFi Tstat-heat only	653	$ 100
	Custom Retrofit	155,585	Up to 50% of Total Resource Cost

Gas Programs			
Program	**Measure**	**MMBtus**	**Rebate Level**
Small Business Direct Install	BOILER RESET 1 STAGE	137	$ 420
	FAUCET_AERATOR_0.5_DI	329	$ 11
	INS_DUCT_SF	3	$ 8
	INSUL_PIPE_DI_1.5IN_H2O	81	$ 6
	INSUL_PIPE_DI_2IN_H2O	3	$ 8
	LF_PRE_RINSE_SPRAY_NZL	937	$ 100
	LF_SHWR_HD_1.75_GPM_DI	754	$ 25
	SALON_NOZZLE	395	$ 100
	THERMOSTAT	1,003	$ 126
C&I Multifamily	Air Sealing_MF	2,513	Average Incentive based on measure mix
	CUST NON-LGT_MF	234	
	Faucet Aerator_MF	219	
	Insulation_MF	5	
	Low-Flow Showerhead_MF	55	
	Pipe Wrap (Water Heating)_MF	27	
	Programmable Thermostat_MF	1,111	
	TSV Showerhead_MF	271	

ATTACHMENT 3

2017 Measurement and Verification Plan

In 2017, National Grid's Measurement and Verification Plan (M&V) will focus on evaluating Rhode Island-specific sites and markets while leveraging as many resources as possible from studies in additional National Grid territories in order to keep costs low. Evaluation budgets are included in Attachment 5, Table E-2 and Attachment 6, Table G-2. The planned studies briefly described below focus on areas of interest to the Rhode Island programs, and build on the deep history of evaluation studies performed by the Company over many years. In order to optimize the use of evaluation resources, where programs are considered to be generally homogeneous with those offered in Massachusetts, the studies will be done in conjunction with the Company's Massachusetts retail affiliate.

A. New Studies Underway or Planned

Residential:

Residential New Construction (RNC) - Code Compliance & UDRH– new

This study will update the 2012 baseline study to assess code compliance of newly constructed single-family homes permitted at the end of the 2012 IECC. The purpose of the studies is to compare compliance levels to the 2012 baseline compliance studies. In addition, the residential study will include a review of the User Defined Reference Home (UDRH) used in the Residential New Construction (RNC) program, as it relates to changes to code and building practices seen in the field.

Residential Electric Load Shape– new

Many residential programs rely on the loadshape information to determine kW benefits, where this study will update the loadshapes based on collecting field data for different measure types and situations. This study will leverage the MA work on the same topic.

Residential Lighting Net-to-Gross – new

This study will leverage with RI data collection the MA residential LED Freeridership / Spillover study being proposed to better understand the Multifamily study results, in an effort to assess RI residential lighting NTG values for 2018. Given the rapid market expansion of LEDs, studies are aging rapidly, such that this information may need more frequent maintenance in the short term.

Residential Electric & Gas Home Energy Reports Impact Evaluation (HER) – new

This study will update savings estimates for the HER program, which delivers behavioral savings based on information sent to customers, such as comparison to neighbors and energy savings tips. Since the HER program affects a large population of customers, the reliability of results using a billing analysis is quite good.

Residential Electric & Gas Income Eligible Impact Evaluation – new

This Rhode Island specific impact evaluation of Income Eligible Single Family Services program will focus on the electric and gas savings resulting from the participation of these dwelling in in-home retrofit of electrical components and weatherization of electric, gas, and fossil fuel heated homes.

HVAC – Ductless MiniSplit Impact Evaluation - ongoing

Massachusetts is conducting an evaluation of cold climate mini split heat pumps that have already been installed in customers' homes. The Rhode Island Office of Energy Resources (OER) and the Company have joined this study to include 15 to 20 Rhode Island sites in order to determine the savings from this technology. This study is expected to be completed by the end of 2016. Draft study results have been applied for 2017 planning assumptions and the final study results will be applied to update impacts in 2017.

Commercial and Industrial:

Custom Electric & Gas – Impact evaluation(s) – ongoing and new

Custom studies that recent kicked off or are expected to continue into 2017 are shown below:

- The Comprehensive Design Assessment (CDA) measure study will leverage a similar study in MA by pooling results for National Grid sites in RI and MA. It was started in 2016, and is expected to complete in 2017. CDA savings for new construction or gut-rehab projects are typically estimated for both electric and gas measures based on modeling, where evaluation efforts are likely to also focus.
- The Custom HVAC study is another MA leveraged study started in mid-2016 and may complete by the end of 2016, though RI is using the MA results in the interim. Custom HVAC measures can include air and waterside improvements to electric and gas equipment, and are expected to involve field monitoring as well as engineering analysis.

- The Small Business Services (SBS) will be a leveraged MA study that will update impact factors for the SBS custom program. The SBS custom program has been growing due to the Customer Directed Option (CDO) which allows implementation vendors to customize projects to customer needs; hence the need to evaluate program savings in light of past studies.

C&I New Construction – Code Compliance and NBI Modeling– ongoing

This study is evaluating the compliance of newly constructed commercial buildings in RI between 2013 and 2015 to the 2009 and the 2012 IECC. The results will also include a qualitative assessment of the effectiveness of the Code Compliance Enhancement Initiative (CCEI).

Upstream Lighting Study - ongoing

The impact evaluation of upstream lighting kicked off in mid-2016 and will continue into 2017. The study involves on-site metering of customer sites to assess savings estimates across the population of upstream customers, and is another study leveraged from a similar study in MA, drawn from a random sample of participants in RI and MA.

C&I Net to Gross evaluation – new

The C&I net-to-gross values from 2014 and 2015 studies will be updated based on an assessment of past customers free-ridership & spillover behavior. The results differentiate between total and influenced savings with “naturally occurring” savings being the differential.

Cross-Sector Studies:

Market, Participation and Penetration study for 3-year planning, Gas & Electric – new

In anticipation of creating the 2018-2020 plan, this study will research customer participation and potential to support development of yearly savings goals in several direct install programs including: EnergyWise Single Family, Income Eligible Single Family, EnergyWise Multifamily, Income Eligible Multifamily, C&I Multifamily and Small Business Direct Install.

Avoided Cost Study, Gas & Electric – new

This study will provide updated avoided costs in support of determining least cost procurement decisions through the benefit-cost screening process. With the recent fluctuations in energy pricing, the study will re-affirm the long term energy cost estimates. The study will be conducted with regional Program Administrators.

System Reliability Procurement (SRP) study – ongoing

After several years of implementation effort on the SRP pilot, this study will assess the savings and benefits achieved by the pilot program, which will then be used to inform program design to further expand the program and benefits elsewhere in RI.

Demand Response (DR) evaluation – new

This evaluation will be designed in combination with demand response implementation efforts, and will assess DR impacts and benefits. Since the demonstration implementation efforts are just beginning, this evaluation will be completed in 2018.

Code Compliance Savings Attribution Study

This study will provide an attribution analysis, estimating the proportion of code compliance that should be attributed to the Code Compliance Enhancement Initiative (CCEI) efforts for both the residential and the commercial sector.

Job Impacts Analysis Study

The Rhode Island Job Impacts study will determine the business and jobs impact due to energy efficiency programs in 2016, similar to the study of 2015. The study will survey the Company, vendors, distributors, partners, and market players to quantify the number of jobs and associated business impacts.

Demonstrations-Process and Impact Evaluations - ongoing Studies will continue to evaluate the process and impacts from residential pilots planned for the field, including residential water heater control, battery storage, and emerging lighting controls pilots. The studies involve a combination of billing analysis, on-site measurement, and customer surveys. The Company plans to begin evaluations as new products or pilots are launched. These studies will include both gas and electric impacts.

Regional Studies

Through the Company's participation in the Northeast Energy Efficiency Partnerships (NEEP) Evaluation, Measurement and Verification activities, the Company expects to be participating in a number of regional evaluation studies. NEEP is currently developing its list of studies for 2017.

B. Recently Completed Evaluation Studies

Recently completed studies that have informed 2016 planning are identified in the chart below, along with a brief summary of the impact of those results in planning the

Company's 2017 programs. (Prior year studies that have been superseded by studies completed since the filing of the 2016 EEPP have been deleted from the list.) The results of these studies were incorporated into the benefit-cost modeling of the 2017 plan. Some of these studies may be regional, or may have included other National Grid jurisdictions. The 2017 EEPP is adopting the results of these studies because the Rhode Island programs are judged to be similar, either in the measures offered, or in terms of structure or program delivery. In these instances, the impact evaluations have been judged by the Company to be applicable to its Rhode Island energy efficiency programs.

2016	
Study	**Impact Descriptions**
DNV-GL, Impact Evaluation of 2014 Custom Gas Installations in Rhode Island Final Report, July 2016	This study is RI-specific and yielded an energy realization rate for Custom Gas projects.
DNV-GL, Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations Final Report, July 2016	This study is RI-specific and yielded an energy realization rate for prescriptive compressed air compressors, dryers, and EE accessories.
DNV-GL, Impact Evaluation of 2012 National Grid-Rhode Island Prescriptive Chiller Program Final Report, July 2016	This study is RI-specific and yielded an energy realization rate for prescriptive chillers.
DNV-GL, Multifamily Impact Evaluation, National Grid Rhode Island, January 2016	This study estimated realization rates for electric and gas savings for 2013 participants using a billing analysis. The results include a low level of precision and thus the realization rates are not applicable. The Company is improving tracking, savings estimations and verification processes in line with the study's recommendations.
Research Into Action, National Grid Rhode Island EnergyWise Single Family Process Evaluation, August 2016	This study surveyed customers, vendors, contractors, and lending agencies to order to assess customer experience, HEAT Loan lender perspectives on the program, performance of the lead vendor and sub-contractors and lessons learned from programs elsewhere in the country. The study will inform program design.
DNV-GL, Impact Evaluation of 2014 EnergyWise Single Family Program, National Grid Rhode Island, August 2016	This study estimated deemed savings values and realization rates for electric and gas 2014 participants using billing and engineering analysis. The Company adopted the deemed savings values in the 2017 program plan.

Peregrine Energy Group, Analysis of Job Creation from 2015 Expenditures for Energy Efficiency in Rhode Island by National Grid, April 2015	A study of the job impacts of National Grid's energy efficiency programs delivered to Rhode Island electricity and natural gas customers in 2015. The study determined that 695.8 FTE employees, across 1,009 companies and agencies had work in 2015 as a result of EE Program investments energy efficiency programs in Rhode Island.
Massachusetts Special and Cross-Cutting Research Area: Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEIs) Study. Prepared by the NMR Group and Three3, Inc. for the Massachusetts Program Administrators. August 5, 2016.	This study developed Non Energy Impacts for low income programs, based on USODE's Weatherization Assistance Program tailored to MA context. Dollar benefits rose substantially over prior values primarily based on avoidance of deaths due to thermal stress.
Cadmus Group; Large Commercial and Industrial On-Bill Repayment Program Evaluation, September, 2016	National Grid commissioned this study to evaluate the financing component of their large commercial and industrial (LCI) energy efficiency program. Cadmus evaluated the program design, performance, and sustainability; the overall market for the program; and the program's penetration of that market to date.
Ductless Mini-Split Heat Pump (DMSHP) Final Heating Season Results; Ductless Mini-Split Heat Pump (DMSHP) Cooling Season Results, COOL SMART Impact Evaluation Team, 2015 / 2016	Heating and cooling memos that describe the number of full load hours found with field installed systems in MA and RI; these hours were used with historic data on incentivized systems to come up with average savings per unit.
2015	
Study	**Impact Descriptions**
DNV-GL, Rhode Island Small Business Energy Efficiency Program Prescriptive Lighting Study: Final Report, July 2015	This study is RI-specific and yielded an energy realization rate prescriptive lighting measures. For coincidence factors, the Company will continue to use values from the NEEP Evaluation, Measurement and Verification Forum.
TetraTech, 2013-2014 Rhode Island C&I Natural Gas Free Ridership and Spillover Study (Memorandum), August 2015	Free ridership and spillover rates for the RI Gas Large Commercial New Construction; Large Commercial retrofit, and Small Business Direct Install Programs, combined with results from the study conducted in 2014.
Cadmus, Inc., High Efficiency Heating Equipment Impact Evaluation: Final Report, March 2015	The study determined revised deemed savings values for each furnace and boiler measure, including condensing boilers and early replacement of heating equipment. The study also reflected the increasing baseline for standard efficiency heating equipment.

DNV-GL, Retrofit Lighting Controls Measure Summary of Findings: Final Report (MA), October 2014	The study examined trends in lighting control savings and noted a decrease in savings over previous program years. It recommended updated coincidence factors as well as potential program and technology areas that may yield higher savings. Finally, the study recommended a change in the savings calculation algorithm for lighting controls.
Tabors Caramanis Rudkevich, Avoided Energy Supply Costs in New England: 2015 Report, April 2015	This study developed new estimates of avoided costs for application in 2016 through 2018 energy efficiency programs throughout the six New England states. Avoided costs were developed for natural gas, electric energy, electric capacity, demand reduction induced price effects (DRIPE), other fuels (oil, propane and wood), and carbon.
DNV-GL, Massachusetts 2013 Prescriptive Gas Impact Evaluation; Steam Trap Evaluation Phase 1, March 2015	The study concluded that there should continue to be both prescriptive an custom pathways for steam trap retrofit incentives, and further recommended that a group convene to review and revise the deemed savings estimate for steam traps. The study also recommended the use of a six year lifetime for steam traps.
Cadmus, Inc., LED Incremental Cost Study – Modeling LightTracker LED and Halogen Pricing Data, June 2015	This memo summarizes selected findings from the LightTracker LED, CFL, and halogen pricing data modeling effort and the resulting state-level price forecast through 2020 for LED, CFL, and halogen bulbs. These results are based on light bulb price data from 25 states that lacked LED programs from 2009 to 2014.
Cadmus, Inc, Cool Smart Incremental Cost Study: Final Report, July 2015	This incremental cost study estimates how manufacturing production costs (MPCs) and purchase prices of residential air conditioning (AC) and heat pump (HP) equipment change as equipment efficiency increases. The results support Cool Smart program enhancements and cost-effectiveness analysis, as well as potential upstream residential upstream heating, ventilation and air conditioning (HVAC) incentive programs.
Cadmus, Inc., Lighting Interactive Effects Study Preliminary Results – Draft, April 2015	This memo details the preliminary findings of the Lighting Interactive Effects study evaluated for the Massachusetts (MA) Program Administrators to better understand and report the true impact of energy efficient lighting retrofits. It recommended factors for electric and gas energy to be applied to residential program savings.

Peregrine Energy Group, Analysis of Job Creation from 2014 Expenditures for Energy Efficiency in Rhode Island by National Grid, April 2015	A study of the job impacts of National Grid's energy efficiency programs delivered to Rhode Island electricity and natural gas customers in 2014. The study determined that 639 FTE employees, across 899 companies and agencies had work in 2014 as a result of EE Program investments energy efficiency programs in Rhode Island.
2014	
Study	**Impact Descriptions**
DNV GL, 2014 , Impact Evaluation of National Grid Rhode Island C&I Prescriptive Gas Pre-Rinse Spray Valve Measure	The evaluation examined the gas and water savings associated with the installation of reduced-flow pre-rinse spray valves. The results are based on site measurements from MA and RI facilities. The final gross gas and water savings are 11.4 MMBtu and 6.410 gallons per spray valve respectively.
DNV GL, 2014 Impact Evaluation of National Grid Rhode Island Custom Refrigerator, Motor and Other Installations	Three custom electric end-uses, Refrigerator, Motor, and Other, were evaluated to provide updated realization rates. The RI results were combined with MA results from a parallel study in order to increase the statistically significance of the final results. The final energy realization rate is 84.8%
DNV GL, 2014 Impact Evaluation of Rhode Island Commercial and Industrial Upstream Lighting Program	This study examined the performance of lighting systems that were discounted at the distribution level. The evaluation included metering at Rhode Island project sites that was combined with the results of metering done in MA to yield more accurate impacts for lighting offered in this upstream initiative. The final energy realization rate is 80.3% for LEDs and 109.5% for fluorescents.
NMR Group, Inc., Northeast Residential Lighting Hours-of-Use Study	This multi-State study provided updated hours-of-use assumptions for residential lighting programs in various room types.
The Cadmus Group, Impact Evaluation: Rhode Island Income Eligible Services, Volume II The Cadmus Group, National Grid Income Eligible Services Process Evaluation	This RI-specific impact evaluation focused on the electric and gas savings resulting from the participation of these dwellings in in-home retrofit of electrical components and weatherization of electric, gas, and fossil fuel heated homes. It used billing analysis, engineering reviews, and interviews for the process components.
TetraTech. 2013 Commercial and Industrial Programs Free-ridership and Spillover Study	Free ridership and spillover rates for the RI Energy Initiative, Design2000plus, and Small Business Services Programs.

Illume Advising and Navigant Consulting, Rhode Island Behavioral Program and Pilots Impact and Process Evaluation	Impact results for the statewide Rhode Island Home Energy Reports (HER) Program and the associate rewards and thermostat pilots. There are multiple program components as well as two pilot efforts, including the following: (1) HERs offered to multiple population segments, (2) an online web portal, (3) a rewards pilot offered to HER participants, (4) a programmable communicating thermostat (PCT) pilot offered to HER participants, and (5) mass media promotional and public relations activities. This evaluation focuses on the first four listed program components. The evaluation effort covers the first year of the program and pilot efforts implemented from April 2013-May 2014.
National Grid, Macroeconomic Impacts of Rhode Island Energy Efficiency Investments REMI Analysis of National Grid's Energy Efficiency Programs	This study quantifies the macroeconomic impacts of National Grid's 2014 EE Program Plan for Rhode Island and provides updated economic impact multipliers to quantify the benefits of future EE programs in the Rhode Island economy. This updates the multipliers from an economic impact study conducted by Environment Northeast (ENE) in 2009.
2013	
Study	**Impact Descriptions**
KEMA, Inc., Impact Evaluation of 2011 Rhode Island Prescriptive Lighting Installations KEMA, Inc., Impact Evaluation of 2011 Rhode Island Custom Lighting Installations	The Custom and Prescriptive Lighting studies involved the impact evaluation of components of the Large Commercial and Industrial electric efficiency programs. The studies included on-site engineering and end-use metering of a statistically drawn random sample of participants. The custom portion of the study was coupled with the results of the 2013 Massachusetts Custom Lighting study.
Energy Efficiency Messaging, Residential Energy Efficiency Program Communications Focus Groups	The study analyzed customers' perceptions of energy efficiency programs and messaging materials via focus group testing.
KEMA, Inc., Impact Evaluation of 2011 Prescriptive Gas Measures	On-site monitoring and verification of installation provided updated impacts for four major prescriptive gas measures. Programs and measures are similar between National Grid affiliates in MA and RI, and results are applied to RI. The overall realization rate for the four measures was approximately 102% and the relative precision was about ±15%.

KEMA, Inc, and DMI, Inc., Impact Evaluation of 2011-2012 Prescriptive VSDs	This evaluation provided a new estimate of the impacts of prescriptive variable speed drives, based on pre-post metering of measures installed in 2011 and 2012. Programs and measures are similar between National Grid affiliates in MA and RI, and results are applied to RI. Key findings include an annual kWh realization rate was 94% with a relative precision of +/- 23%, and identification of factors that influenced the realization rate.
The Cadmus Group, Inc., 2012 Residential Heating, Water Heating, and Cooling Equipment Evaluation: Net-to-Gross, Market Effects, and Equipment Replacement Timing	The results of this study yielded updated net-to-gross factors and estimates of the timing of equipment replacement for residential heating and cooling measures. Programs and measures are similar between National Grid affiliates in MA and RI, and results are applied to RI.
KEMA, Inc., Process Evaluation of the 2012 Bright Opportunities Program	This study provided net-to-gross ratios for the Commercial Upstream Lighting initiative offered in MA and RI, as well as a process assessment of this generally successful initiative.
KEMA, Inc., Impact Evaluation of 2010 Prescriptive Lighting Installations	The RI Prescriptive lighting study listed above did not examine case lighting separately from other lighting systems. To complement the RI-specific results, this MA study provided impact updates on case lighting.
Opinion Dynamics (2013). Massachusetts Cross-Cutting Behavioral Program Evaluation Integrated Report.	This study provided an updated realization rate for savings from gas customers who participate in the Opt-out channel of the Home Energy Reports program.

2012	
Study	**Impact Descriptions**
NMR Group, Inc., Rhode Island 2011 Baseline Study of Single-family Residential New Construction	Provides a baseline study of the characteristics of single-family homes recently completed in Rhode Island and permitted under the 2009 International Energy Conservation Code (IECC) that did not participate in the Rhode Island Residential New Construction Program (Program). These can be used to update User Defined Reference Home (UDRH) assumptions used in calculating Program savings.
DNV-KEMA, ERS, and APPRISE, Rhode Island Energy Code Compliance Baseline Study	Provides a baseline estimate of statewide energy code compliance for commercial buildings, provides feedback on patterns of compliance and non-compliance, and identifies opportunities for RI in the quest to achieve greater compliance with state energy codes.
KEMA, Inc., Impact Evaluation of the 2010 Custom –Industrial Process and Compressed Air impact evaluation, September, 2012	Study produced realization rates for energy, seasonal demand, and percent energy on peak for both programs. The RI results were combined with MA results from a parallel study in order to increase the statistical significance of the final results. The final energy realization rate is 92.7%.
TetraTech, Final Report – Commercial and Industrial Non-Energy Impacts Study, (prepared for Massachusetts Program Administrators), June 29, 2012	This report provides a comprehensive set of statistically reliable Non-energy impact (NEI) estimates across the range of C&I prescriptive and custom retrofit programs offered by the MA electric and gas Program Administrators (Pas). The analytical methods used allow this report's findings to be applicable to RI.

2011	
Study	**Impact Descriptions**
NMR Group, Inc., Massachusetts Program Administrators Massachusetts Special and Cross-Sector Studies Area, Residential and Low-Income Non-Energy Impacts (NEI) Evaluation, August, 15, 2011.	Identification and quantification of non-energy impacts for residential and low-income programs.

NMR Group, Inc., The Rhode Island Appliance Turn-In Program Process Evaluation, March 4, 2011.	Combined, these two studies assessed free-ridership rates and savings for the Rhode Island Refrigerator and Freezer Recycling program. In addition, the evaluation found that there were three distinct groups of refrigerators being recycled through the program – primary, secondary – replaced, and secondary – not replaced. The study produced updated free-ridership rates and savings for the three categories of refrigerators and freezers.
NMR Group, Inc., The Rhode Island Appliance Turn-In Program Impact Evaluation, October 2011.	
NMR Group, Inc., Results of the Multistate CFL Modeling Effort, April 15, 2011.	This study examined the 2010 Energy Star® Lighting program. The research effort included participation in a multistate modeling effort which resulted in a revised free-ridership estimate for screw-in CFLs.
The Cadmus Group, Impact Evaluation for Rhode Island Multifamily Gas Program EnergyWise Program, July 12, 2011	A billing analysis was conducted for 2010 Multifamily gas participants. Results showed a realization rate of 121% indicating ex post verified savings as 21% greater than the engineering savings estimate.
Opinion Dynamics Corporation, Evaluation of National Grid's Community Pilot Program Energy Action: Aquidneck and Jamestown, September, 2011.	The evaluation examined participation in all energy efficiency programs through the 2009-2010 Community Initiative, known as Energy Action: Aquidneck and Jamestown. The evaluation found that the initiative was cost-effective with a benefit-cost ratio of 2.25. The evaluation also examined processes and made recommendations for increasing participation in future initiatives.
KEMA, Inc., Impact Evaluation of the 2009 Custom HVAC and 2008-2009 Custom CDA Installations, September 1, 2011	Study produced realization rates for energy, seasonal demand, and percent energy on peak for both programs. The RI results were combined with MA results from a parallel study in order to increase the statistical significance of the final results. The final energy realization rate for Custom HVAC is higher than the PY 2011 realization rate by about 10% (increased from 100.5% to 110.4%). The final energy realization rate for Custom CDA is higher than the PY 2011 realization rate by about 20% (increased from 97.2% to 119.6%).

KEMA, Inc., C&I Lighting Loadshape Project, Prepared for the Regional Evaluation, Measurement, and Verification Forum, June 2011.	A compilation of lighting loadshape data from the Northeast. The study provided updated coincidence factors for the Energy Initiative and Small Business Lighting programs. The Small Business program summer coincidence factor went from 0.80 to 0.79, while the Energy Initiative summer coincidence went from 0.88 to 0.89
KEMA, Inc., C&I Unitary HVAC Loadshape Project Final Report, Prepared for the Regional Evaluation, Measurement, and Verification Forum, June 2011.	From end use metering, the study produced updated diversity and equivalent full load hours for unitary HVAC measures
2010	
Study	**Impact Descriptions**
ADM Associates, Inc., Residential Central AC Regional Evaluation, Final Report, October 2009	KWh and kW savings figures for the installation of efficient residential CAC systems
2009	
Study	**Impact Descriptions**
Nexus Market Research, Residential Lighting Markdown Impact Evaluation, January 20, 2009	Energy and demand savings from the use of lighting markdown products
KEMA, Inc., Design 2000plus Lighting Hours of Use & Load shapes Measurement Study, July 2, 2009	Hours of use, hours of use realization rate, on-peak kWh percentage, load profile, connected demand adjustment factor, summer and winter peak combined coincidence and interactive factors for the prescriptive lighting measures installed by participants of the 2007 National Grid Design2000plus program

2008	
Study	**Impact Descriptions**
Nexus Market Research, Inc., RLW Analytics, Inc., Residential Lighting Measure Life Study, June 4, 2008	Estimation of measure life for lighting products distributed throughout New England
Michael Ozog, Summit Blue, Joint Small Business Services Program Billing Analysis, 2007	Realization rates for lighting measures installed through the Small Business Services program
2007	
Study	**Impact Descriptions**
RLW Analytics, Small Business Services Custom Measure Impact Evaluation, March 23, 2007	Verification of energy savings from custom lighting projects in the Small Business Services program.
RLW Analytics, Impact Evaluation Analysis of the 2005 Custom SBS Program, May 29, 2007	Realization rates for the Small Business Services program

Study name: Analysis of Job Creation from 2015 Expenditures for Energy Efficiency in Rhode Island by National Grid

Type of Study: Economic Impact
Evaluation Conducted by: Peregrine Energy Group
Date Evaluation Conducted: 2016

Evaluation Objective and High Level Findings:
In order to quantify the number of direct workers involved, National Grid commissioned Peregrine Energy Group, Inc. (Peregrine) to conduct a study of the job impacts of National Grid's energy efficiency programs delivered to Rhode Island electricity and natural gas customers in 2015.

Peregrine determined that 695.8 full-time equivalent (FTE) employees had work in 2015 as a result of investments by National Grid in energy efficiency programs provided to its Rhode Island electricity and natural gas customers. Most of the jobs created as a result of energy efficiency investments were local because they were tied to installation of equipment and other materials. The study identified 1,009 companies and agencies involved in National Grid's 2015 energy efficiency programs, 79% of which were located in Rhode Island.

The study is designed to be conducted annually.

Programs to which the Results of the Study Apply: This is an overall indicator of economic impact, not applied to a specific program.

Evaluation Recommendations and Program Administrator Response: The evaluation study does not include recommendations.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
N/A

Savings Impact: N/A

Study name: DNV-GL, Impact Evaluation of 2014 Custom Gas Installations in Rhode Island Final Report, July 2016

Type of Study: Impact
Evaluation Conducted by: DNV-GL
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study evaluated several RI installations incentivized through the custom gas program to come up with an updated realization rate (RR) for claimed gas savings. The RI study leveraged projects completed by the Company's MA affiliate in the recent MA custom gas study to reduce cost, while still meeting statistical reliability requirements. Formerly, the RI custom gas RR had been 75.5%, while the most recent study yielded a RR of 89%, showing a significant improvement in savings estimations.

Programs to which the Results of the Study Apply:
Large Commercial Gas Custom Retrofit
Large Commercial Gas Custom New Construction

Evaluation Recommendations included in the study:
DNV GL recommends National Grid to increase the duration of pre-metering from 1 or 2 days to at least 1 week (Monday thru Sunday) to capture the weekly operating profile. Including holidays/weekends in the metering period would give a better estimate of the weekly usage. When using a proxy machine to estimate savings, check if the proxy is actually representing the installed measure. For example: To calculate the amount of DHW used in a university dormitory/residence hall the TA study used a proxy residence hall that has different number of students which alters the savings estimate.

Project documentation should provide more details on the assumptions used for estimating savings. For one of the sampled sites, the R-values of building envelope components have been adjusted to account for infiltration; this assumption was not clearly mentioned in TA report but was learnt via reverse engineering the savings calculations.

National Grid should enhance the post installation visit/commissioning by recording measure related operating parameters like on-site temperature set-points, occupancies and other schedules. These parameters that are used in the savings calculations when updated affect the savings estimate significantly.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid will use the study results in program planning and reporting in 2016 for the natural gas programs.

Savings Impact: The study result will be used to adjust gross custom gas savings.

Study name: DNV-GL, Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations Final Report, July 2016

Type of Study: Impact
Evaluation Conducted by: DNV-GL
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study evaluated several RI installations incentivized through the prescriptive compressed air (CAIR) program to come up with updated claimed savings values. The RI study leveraged projects completed by the Company's MA affiliate in the recent MA prescriptive CAIR study to reduce cost, while still meeting statistical reliability requirements.

Programs to which the Results of the Study Apply:
Large Commercial Electric New Construction, Prescriptive CAIR

Evaluation Recommendations included in the study:

Recommend compressed air vendors conduct simple short term metering. While this is a prescriptive program, which is intended to be streamlined, collecting very simple short-term data prior to specifying hours of operation on an application would help improve the accuracy of the annual hours of operation. This type of metering could be done by the vendor, and could be a simple as a week of motor runtime. Another option would be to investigate the incremental cost of adding monitoring at the time of compressor installation as part of the incentive package.

Consider a review of hours of operation prior to finalizing applications. In many cases the actual operating hours were observed to be significantly higher than entered on the application form, resulting in unclaimed savings. For applications with relatively low operating hours (<~4,000 hrs/yr), it may be worthwhile to perform a brief operational hours review to confirm actual plant operating hours.

Encourage vendors to look for additional compressed air savings opportunities. While the customer is engaged with upgrading their compressed air system, it may be worthwhile to investigate operation at a lower discharge pressure. Additional savings will result if the discharge pressure can be reduced. Likewise, consider performing an air leak survey to determine if additional savings can be realized from reducing air leaks.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid will use the study results in program planning and reporting in 2016 for the prescriptive CAIR program.

Savings Impact: The study result will be used to adjust CAIR deemed savings.

Study name: DNV-GL, Impact Evaluation of 2012 National Grid-Rhode Island Prescriptive Chiller Program
Final Report, July 2016

Type of Study: Impact
Evaluation Conducted by: DNV-GL
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study evaluated several RI installations incentivized through the prescriptive chiller program to come up with updated deemed savings values. The RI study leveraged projects completed by the Company's MA affiliate in the recent MA prescriptive chiller study to reduce cost, while still meeting statistical reliability requirements.

Programs to which the Results of the Study Apply:
Large Commercial electric New Construction, prescriptive chiller

Evaluation Recommendations included in the study:

Consider more research around the key finding that many chillers operate at very low part loads. Consider looking into the implications for reliability, cost and energy savings with relation to chillers operating at very low part loads. Based on the feedback evaluators have received from some engineers, baseline chillers may operate at extremely low efficiencies at these conditions, which (if it can be quantified) could result in very large actual savings. National Grid may also consider an educational initiative to help vendors and customers understand the sizing requirements of their facility better.

Consider a closer review of project applications. Our evaluation found some sites with multiple chillers and also one installation with primarily a process load. Based on the TRM definition, only the lead chiller in a multiple chiller plant may be rebated. Likewise, the prescriptive program is designed for comfort cooling applications, which wouldn't include process loads.

Encourage vendors to look for additional chiller savings opportunities. In most cases the chillers were operating at the same conditions as prior to installation, according to facility personnel. When making changes to the chiller plants, it is worthwhile to consider different controls set points, such as lower condenser water temperature, higher chilled water temperature and resetting chilled water temperatures based on outdoor conditions.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid will use the study results in program planning and reporting in 2016 for the prescriptive chiller program.

Savings Impact: The study result will be used to adjust prescriptive chiller deemed savings

Study name: DNV-GL, Multifamily Impact Evaluation, National Grid Rhode Island, January 2016

Type of Study: Impact
Evaluation Conducted by: DNV-GL
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study estimated realization rates for electric and gas savings for 2013 participants using a billing analysis. The results include a low level of precision and thus the realization rates are not applicable. The Company is improving tracking, savings estimations and verification processes in line with the study's recommendations.

Programs to which the Results of the Study Apply:
Residential Multifamily
Commercial Multifamily

Evaluation Recommendations included in the study:
The purpose of performing this billing analysis was to produce electric and gas realization rates for activity in the 2013 Multifamily Program. The following two conclusions provide these key results.

- Based on the electric billing analysis, we estimate the 2013 Multifamily Program electric realization rate to be 57% with a precision of ±31% at the 90% confidence interval. This result provides a final estimate of electric program savings of 2,503 MWh. Based on our examination of tracking savings, we believe this realization rate is being driven by a tracking savings calculation error and overestimated LED lighting hours of use.
- Based on the gas billing analysis, we estimate the 2013 overall Multifamily Program gas realization rate without commercial activity to be 53% with a precision of ±25% at the 90% confidence interval. It is more difficult to discern the possible drivers of the gas realization rate. However, based on our examination of tracking savings, we believe this realization rate is being driven by overestimated air sealing impacts. We further note that National Grid is considering a review of custom measure tracking system estimates as it is believed these savings may also be overinflated, although we did not examine this measure specifically as part of this study.
- The precision around the results in this study are high, but reasonable for a billing analysis. Using the electric realization rate and precision as an example, a result of +/- 31% means we are 90 % confident the results is within 31% above or below the point estimate. This is a much better level of precision than statistical significance; evidence that a result is different than zero.

The following recommendations rest upon the activities undertaken as part of this study. Some of these recommendations may already be planned and/or undertaken as part of National Grid's ongoing commitment to improving program operations and tracking of impacts.

- Based on our examination of the hours of use for LED bulbs, we recommend that National Grid re-assess inputs used to estimate the savings for this measure. While our

findings were not conclusive on this issue, we believe there is sufficient evidence to warrant a review of the hours estimated for tracking purposes. In 2013, LED bulbs were the largest contributor to program savings according to the tracking data and as the LED technology becomes more ubiquitous and displaces CFLs in program offerings, it is likely to become increasingly important to have a savings estimate based upon well founded hours of use assumptions.

- Based on our examination of the tracking savings for the top three gas saving measures and their relationship to pre normalized energy consumption, as well as the magnitude of program savings that would be needed to drive the realization rate, we recommend that National Grid re-examine the way in which air sealing savings are being calculated for the Multifamily Program. We also recommend that the custom measure category be examined as part of the process of understanding ex ante estimates and whether they might be overestimated. While this measure did not make the top three gas saving measures and did not received much scrutiny in our examination, we understand that National Grid has existing concerns about the tracking savings for gas custom measures and we believe it makes a great deal of sense to examine them in the wake of this study.
- Currently, National Grid uses an air sealing unit of measure installation of amount of time used to perform the treatment (per hour). We recommend that National Grid begin tracking the quantity of program installed units for air sealing activity by linear feet, CFM reduced or some other unit that can be normalized in a meaningful way. The current Rhode Island Technical Manual drives its air sealing savings off CFM reduction, so this unit of installation may already be available for use. Air sealing is one of the primary measures driving the savings in the Multifamily Program.
- We do not believe the realization rates observed in this study are due to quality of measure installation. However, as a next step in understanding program impacts, National Grid might consider a limited set of inspections at participating facilities to ensure this issue is not a contributor to the realization rates observed in this study. An alternative would be to review findings from quality control work performed by CMC on the program to be sure those observations are not signaling a possible issue that might be causing the realization rate.
- In this study we provide both fuel and program level realization rates. The program level results are provided to help understand whether performance in one program might be driving the overall realization rate. The realization rates among the various electric and gas programs are stable and without significant differences among them. These results do not indicate that there is a difference between the different program modes under each fuel type with respect to effectiveness of installed savings. This suggests that fuel level results are appropriate for application at the program level despite differences in the program level realization rates.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study: The Company is improving tracking, savings estimations and verification processes in line with the study's recommendations.

Savings Impact: The study result will be used.

Study name: Research Into Action, National Grid Rhode Island EnergyWise Single Family Process Evaluation, August 2016

Type of Study: Process
Evaluation Conducted by: Research Into Action
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study surveyed customers, vendors, contractors, and lending agencies to order to assess customer experience, HEAT Loan lender perspectives on the program, performance of the lead vendor and sub-contractors and lessons learned from programs elsewhere in the country. The study will inform program design.

Programs to which the Results of the Study Apply:
Residential Single family

Evaluation Recommendations included in the study:
Conclusion 1: Program processes work smoothly, both for participants and for those involved in program delivery

Recommendation 1: National Grid and RISE should record the participants that experience innovative program delivery strategies in order to assess the effectiveness of those strategies.

Recommendation 2: National Grid and RISE should use experimental designs to determine the effectiveness of innovative program delivery strategies.

Conclusion 2: Higher incentives and an interest rate buy-down to 0% both add value to the EnergyWise program.

- **Recommendation 3**: National Grid should consider conducting further research to more precisely quantify the impact of incentive levels and interest rates on weatherization uptake and project characteristics.

Conclusion 3: The potential exists for market saturation or other market conditions to slow weatherization project uptake.

- **Recommendation 4:** National Grid should continue to monitor audit-to-weatherization conversion rates and investigate causes of any long-term declines.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
The study will inform program design.

Savings Impact: Not directly.

Study name: DNV-GL, Impact Evaluation of 2014 EnergyWise Single Family Program, National Grid Rhode Island, August 2016

Type of Study: Impact
Evaluation Conducted by: DNV-GL
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
This study estimated deemed savings values and realization rates for electric and gas 2014 participants using billing and engineering analysis. The Company adopted the deemed savings values in the 2017 program plan.

Programs to which the Results of the Study Apply:
EnergyWise Residential single family, gas & electric

Evaluation Recommendations included in the study:

- Adopt the deemed savings estimates produced by this evaluation.
- Update the approach used to estimate energy savings for natural gas weatherization in the tracking system. This can include updating the prescriptive savings formulas used to match results from this evaluation, or a change to a deemed savings estimate.
- Consider using the results from this effort as a starting point for developing savings for LED bulbs in 2017. The numbers reported here are representative of savings from the portion of the 2014 program year that is likely to be most similar to 2017. However, if the program design—especially with regard to the numbers of LED bulbs installed per home—varies significantly from the design used in late 2014, another number such as the Massachusetts Market Adoption Model may be appropriate to substitute. We also recommend that National Grid consider in 2017 whether and how to update the savings estimates for LEDs going forwards. This study did not look into the issue of how well the late-2014 results represent program activity in 2015 and 2016. The fact that most households even in late 2014 installed both LEDs and CFLs suggests that they are not a perfect representation of a future in which only LEDs are installed. Options for updating savings estimates could include a review of tracking data from 2015-16, a literature review of results from other states, or an update to the billing analysis using 2015 data.
- In the future, we recommend that billing analyses include all measures installed by participants who began their participation in the analysis year, including those whose participation spanned multiple years, to the extent possible. At least for natural gas, we found that multi-year participants install more measures overall than single-year participants.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
The Company adopted the deemed savings values in the 2017 program plan.

Savings Impact: The study results have been applied.

Study name: Massachusetts Special and Cross-Cutting Research Area: Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEIs) Study. August 5, 2016.

Type of Study: Non-Energy Impact
Evaluation Conducted by: NMR & Three3
Date Evaluation Conducted: 2016

Evaluation Objective and High Level Findings:

- This study developed Non Energy Impacts for low income programs, based on USODE's Weatherization Assistance Program tailored to MA context. Dollar benefits rose substantially over prior values based on avoidance of deaths due to thermal stress, both cold and hot.

Programs to which the Results of the Study Apply:

Low Income Appliance Management Program, gas & electric

Evaluation Recommendations included in the study:

Following are NMR's recommendations for integrating the results of Three3's MA LI SF NEI study presented in this report into the NEI estimates currently used by the MA PAs (see Section 10.0):

- **Reduced Asthma**—Replace the currently used Health Related NEIs estimate of $19 per year derived from the 2011 NMR study with the asthma NEI value of $9.99 presented in this report (as well as the other health-related NEIs included in this report: reduced thermal stress and fewer missed days at work)
- **Reduced Thermal Stress (both Hot and Cold-Related)**—Replace the currently used Health Related NEI estimate of $19 per year derived from the 2011 NMR study with the cold- and heat-related thermal stress NEI values of $463.21 and $145.93, respectively, presented in this report (as well as the other health-related NEIs included in this report: reduced asthma and fewer missed days at work).
- **Fewer Missed Days at Work**—Replace the currently used Health Related NEIs value estimate of $19 per year derived from the 2011 NMR study with the missed days of work due to illness NEI value of $149.45 presented in this report (as well as the other health related NEIs included in this report: reduced asthma and fewer missed days at work).
- **Reduced Use of Short-Term, High Interest Loans**—NMR does not recommend counting the NEI value produced by Three3 in this report as it is not likely a benefit in the current TRC context, though it could be considered if a different cost were used in the future. Additionally, the PAs could consider further examination of a potential multiplier effect to determine if the benefits accruing to low-income households from bill savings are larger than the corresponding cost in the form of lost PA revenues.
- **Increased Productivity At Home**—The WAP study theorized that the NEI of *increased productivity at home* is attributable to making the weatherized homes more comfortable and conducive to better sleep and therefore likely overlaps with the NEI of improved comfort currently claimed by the PAs.12 Because of the potential overlap,

NMR recommends counting half the NEI value for *increased productivity at home* (to an adjusted value of $18.88).

- **Reduced CO poisoning**—Replace the CO poisoning portion ($6.38 per year) of the Improved Safety NEI derived from the 2011 NMR study with the reduced CO NEI value of $183.30 (one-time PV given the shorter 5-year life of CO detectors) presented in this report.
- **Reduced Risk of Fire and Fire-Related Property Damage**—Replace the fire-safety related NEI of $38.67 per year (for avoided fire deaths, injury, and property damage) currently claimed by the PAs with the fire-safety related NEI value of $57.48 presented in this report

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
The Company adopted the NEI values in the 2017 program plan.

Savings Impact: None.

Study name: Cadmus Group; Large Commercial and Industrial On-Bill Repayment Program Evaluation, September, 2016

Type of Study: Finance
Evaluation Conducted by: Cadmus Group
Date Evaluation Conducted: 2016

Evaluation Objective and High Level Findings:

- National Grid commissioned this study to evaluate the financing component of their large commercial and industrial (LCI) energy efficiency program. Cadmus evaluated the program design, performance, and sustainability; the overall market for the program; and the program's penetration of that market to date.

Programs to which the Results of the Study Apply:

Large Commercial & Industrial

Evaluation Recommendations included in the study:

- Conclusion: The OBR program design is appropriate to program goals, conforms to industry standards, and results in satisfied customers.
- Conclusion: The OBR program requires substantial future allocations to the fund to fulfill its potential for increased participation.
    - Recommendation: Consider setting formal targets for savings and participation in the fund, and establish a funding schedule that will support the projected participation and protect against defaults.
- Conclusion: National Grid may be able to charge interest legally on OBR financing, but the benefits are not worth the negative impacts.
    - Recommendation: Cadmus does not recommend the utility pursue an interest charge at this time, though the utility may want to revisit this issue in the future when the fund reaches a more stable level of participation.
- Conclusion: The OBR Program may benefit from more clearly defined objectives and annual performance targets.
    - Recommendation: Program managers and other National Grid stakeholders should evaluate whether financing's purpose is to encourage more cost-effective energy savings, drive deeper savings per project, drive increased participation, or some other goal or combination of goals.
- Conclusion: Based on survey responses, 78% of participants would not have proceeded with the same project at the same time had they not had access to the financing in addition to the rebates.
    - Recommendation: Eliminating either rebates or financing will likely reduce program participation; however, the absolute value of the incentive may not be as important as its general availability.
- Conclusion: There is significant opportunity for energy efficiency upgrades among LCI customers, as well as significant demand for financing.

    - Recommendation: If funding is available, consider broadening promotion of OBR to a wider audience.
- Conclusion: Customers who own their own buildings and are aware of their energy costs may be more likely to participate in the OBR program.
    - Recommendation: Formalize the desirable characteristics of ideal participants and provide these to sales executives and other stakeholders who play key roles in identifying and offering OBR to customers.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
The study will inform program design.

Savings Impact: Not directly.

Name of Memos: Ductless Mini-Split Heat Pump (DMSHP) Final Heating Season Results; Ductless Mini-Split Heat Pump (DMSHP) Cooling Season Results, COOL SMART Impact Evaluation Team, 2015 / 2016

Type of Study: Impact
Evaluation Conducted by: Cadmus Group
Date Evaluation Conducted: 2015-16

Evaluation Objective and High Level Findings:
Heating and cooling memos that describe the number of full load hours found with field installed systems in MA and RI; these hours were used with historic data on incentivized systems to come up with average savings per unit.

Programs to which the Results of the Study Apply:
Residential HVAC

Evaluation Recommendations included in the study:
As shown in the separate DMSHP baseline memo, the most common heating baseline for DMSHPs was a code-minimum DMSHP. Starting in 2016, all DMSHP units sold in the United States must meet a minimum heating season performance factor (HSPF) of 8.2, up from 7.7. The team calculated equivalent full load hours consistent with a HSPF-based savings calculation and savings against an 8.2 HSPF baseline, shown in Table 1 below.

Stated Purchase Intent	Full Load Hours2	Estimated Annual Savings – 8.2 HSPF Baseline (kWh)	Percent of Total
Purchased for Cooling	220	103	31%
Purchased for Heating	841	395	4%
Purchased for Heating and Cooling	531	250	65%
Total	**447**	**210**	**100%**

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
The memos will be used in savings calculations.

Savings Impact: The memo results will be used to calculate savings.

ATTACHMENT 4

Total Resource Cost Test Description

Introduction

This section has been prepared pursuant to Section 1.2(A)(ii) of the Least Cost Procurement Standards (Standards) for the procurement of energy efficiency resources, approved by the Rhode Island PUC in Docket 4443. Much of the material in this section was presented during the Technical Session on May 8, 2014.

Although this Attachment is being included in the 2017 EEPP, it is the intent of National Grid that the Total Resource Cost (TRC) test as described here will be in place until the next review of the Standards in advance of the 2018-2020 Least Cost Procurement Plan. The component values may be updated over the course of the three year period based on the availability of new study results. The source for many of the avoided cost value components is "Avoided Energy Supply Costs in New England: 2015 Report," (2015 AESC Study) prepared by Tabors Caramanis and Rudkevich (TCR) for the Avoided Energy Supply Component Study Group, April 2015.[1] This report was sponsored by all the electric and gas efficiency program administrators in New England and is designed to be used for cost effectiveness screening in 2016 through 2018.

As specified in the Standards,

a. The Utility shall assess measure, program and portfolio cost-effectiveness according to the TRC test. The Utility shall, after consultation with the Council, propose the specific benefits and costs to be reported and factors to be included in the Rhode Island TRC test and include them in the EE Procurement Plan. These benefits may include resource impacts and non-energy impacts. The accrual of non-energy impacts to only specific programs or technologies, such as income-eligible programs or combined heat and power, may be considered.

b. That test shall include the costs of CO2 mitigation as they are imposed and are projected to be imposed by the Regional Greenhouse Gas Initiative. The test shall also include any other utility system costs associated with reasonably anticipated future greenhouse gas reduction requirements at the state, regional, or federal level for both electric and gas programs. A comparable benefit for

[1] The report is available online at: http://ma-eeac.org/wordpress/wp-content/uploads/2015-Regional-Avoided-Cost-Study-Report1.pdf. This study forecasts avoided costs for three years, compared to prior studies which developed avoided costs applicable to a two-year period. Rhode Island and three other states have opted to have one update during the three year study period. The update will be completed in late 2016, to allow for the consideration of the latest information on regional clean power projects, and will be used in National Grid's 2018 annual and 2018-2020 three-year plans.

greenhouse gas reduction resulting from natural gas or delivered fuel energy efficiency or displacement may be considered.

c. Benefits and costs that are projected to occur over the term of each EE Program Plan shall be stated in present value terms in the TRC test calculation, using a discount rate that appropriately reflects the risks of the investment of customer funds in energy efficiency; in other words, a low-risk discount rate which would indicate that energy efficiency is a low-risk resource in terms of cost of capital risk, project risk, and portfolio risk. The discount rate shall be reviewed and updated for each EE Program Plan, as appropriate, to ensure that the applied discount rate is based on the most recent information available.

The Total Resource Cost Test Overview

The TRC Test compares the present value of a stream of **net benefits** associated with the **net savings** of an energy efficiency measure or program **over the life** of that measure or program to the total costs necessary to implement the measure or program. The term "resource" focuses this test on the benefits and costs associated with the procurement, or acquisition, of a resource, in this case, energy efficiency. The TRC Test may be applied to any energy efficiency program independent of the primary fuel or resource the effort focuses on.

The TRC test captures the value created by efficiency measures installed in a particular program year over the useful life of the measure. The measure life is based on the technical life of the measure modified to reflect expected measure persistence. Because the TRC test captures the value associated with a stream of benefits over a period of time, the benefits from a measure are present valued so that costs and benefits may be compared.

The benefits calculated in the TRC Test are the avoided resource supply and delivery costs, valued at marginal cost for the periods when there is a load reduction, as well as the monetized value of non-resource savings.

The program costs are those paid by both the utility and by participants plus the increase in supply costs for any period when load is increased. All equipment, installation, O&M, removal, evaluation and administration costs are included.

All savings included in the value calculations are net savings. The expected net savings are typically an engineering estimate of savings modified to reflect the actual realization of savings based on evaluation studies. The expected net savings also reflect market effects due to the program. The TRC test captures the combined effects of a program

on both the participating customers and those not participating in a program. From a resource acquisition perspective, if the program induces participants or non-participants to acquire energy efficiency devices without program expenditures, these effects—known as spillover—should be attributed as program benefits in the TRC Test. The costs incurred by customers to acquire equipment on their own are also counted as costs in the TRC Test.

On the other hand, if a customer accepts program funds to implement an energy efficiency measure they would have done anyway, the savings associated with this practice is known as "free ridership." From the perspective of resource acquisition through utility programs, it is important to distinguish whether the customer would have implemented the efficiency measure without the program. Therefore, savings associated with free-ridership are deducted from program savings.[2]

The benefits and costs considered in Rhode Island are detailed in the next section.

Description of Program Benefits and Costs

The following benefits and costs are included in the TRC test. They are listed here with details after.

1) Electric Energy Benefits
2) Electric Generation Capacity Benefits
3) Electric Transmission Capacity and Distribution Capacity Benefits
4) Natural Gas Benefits
5) Fuel Benefits (including the value of delivered fuel savings from programs that influence delivered fuel consumption)
6) Water and Sewer Benefits
7) Non-Energy impacts
8) Price Effects
9) Combined Heat and Power Benefits
10) Utility Costs
11) Participant Costs

All of the benefits are monetized benefits directly associated with the installation of electricity or natural gas efficiency projects. There are additional effects of energy efficiency felt outside the actual project itself, and not included in the valuation of the

[2] Both free-ridership and spillover have been determined from surveys of program participants, non-participants, and other market actors

project. These are called externalities, or non-embedded values. Per the standards, externalities are not included in the calculation of benefits in the TRC test.

1) Electric Energy Benefits.

Avoided electric energy costs are appropriate benefits for inclusion in the TRC Test. When consumers do not have to purchase electric energy because of their investment in energy efficiency, an avoided resource benefit is created.

Electric energy savings are valued using the avoided electric energy costs developed in the 2015 AESC Study, Appendix B.[3] The values in the AESC Study represent wholesale electric energy commodity costs that are avoided when generators produce less electricity because of energy efficiency.[4] They include pool transmission losses incurred from the generator to the point of delivery to the distribution companies, the costs of renewable energy credits borne by generators, and a wholesale risk premium that captures market risk factors typically recovered by generators in their pricing. The avoided energy costs also internalize the expected cost of complying with current or reasonably anticipated future regional or federal greenhouse gas reduction requirements which are borne by generators and passed through in wholesale costs.

The avoided energy costs in the 2015 AESC Study are provided in four different costing periods consistent with ISO-NE definitions. Net energy savings are split up into these periods in the value calculation. The time periods are defined as follows:

- Winter Peak: October – May, 7:00 a.m. – 11:00 p.m., weekdays excluding holidays.
- Winter Off-Peak: October – May; 11:00 p.m. – 7:00 a.m., weekdays. Also including all weekends and ISO defined holidays.
- Summer Peak: June – September, 7:00 a.m. – 11:00 p.m., weekdays excluding holidays.
- Summer Off-Peak: June – September; 11:00 p.m. – 7:00 a.m., weekdays. Also including all weekends and ISO defined holidays.

In the benefits calculation, energy savings are grossed up using factors that represent transmission and distribution losses because a reduction in energy use at the customer

[3] The values for Rhode Island have also been included as Table E-9 in Appendix 5

[4] Avoided costs may be viewed as a proxy for market costs. However, avoided costs may be different from wholesale market spot costs because avoided costs are based on simulation of market conditions, as opposed to real-time conditions. They may be different from standard offer commodity costs because of time lags and differing opinions on certain key assumptions, such as short term fuel costs.

means that amount of energy does not have to be generated, plus the extra generation that is needed to cover the losses that occur in the delivery of that energy is not needed.

Net energy savings for a program (or measures aggregated within a program) are allocated to each one of these time periods and multiplied by the appropriate avoided energy value.[5] The dollar benefits are then grossed up using the appropriate loss factors representing losses from the ISO delivery point to the end use customer.

- Summer Peak Energy Benefit ($) = kWh * $Energy\%_{SummerPk}$ * $SummerPk\$/kWh_{(@Life)}$ * (1 + $\%Losses_{SumPk\text{-}kWh}$)
- Summer OffPeak Energy Benefit ($) = kWh * $Energy\%_{SummerOffPk}$ * $SummerOffPk\$/kWh_{(@Life)}$ * (1 + $\%Losses_{SummerOffPk\text{-}kWh}$)
- Winter Peak Energy Benefit ($) = kWh * $Energy\%_{WinterPk}$ * $WinterPk\$/kWh_{(@Life)}$ * (1 + $\%Losses_{WinterPk\text{-}kWh}$)
- Winter OffPeak Energy Benefit ($) = kWh * $Energy\%_{WinterOffPk}$ * $WinterOffPk\$/kWh_{(@Life)}$ * (1 + $\%Losses_{WinterOffPk\text{-}kWh}$)

2) Electric Generation Capacity Benefits.

Avoided electric generation capacity values are appropriate for inclusion in the TRC Test. When generators do not have to build new generation facilities or when construction can be deferred because of consumers' investments in energy efficiency, an avoided resource benefit is created. In the New England capacity market, capacity benefits accrue because demand reduction reduces ISO-NE's installed capacity requirement. The capacity requirement is based on load's contribution to the system peak, which, for ISO-NE, is the summer peak. Therefore, capacity benefits accrue only from summer peak demand reduction; there is currently no winter generation capacity benefit.

Demand savings created through program efforts are valued using the avoided capacity values from the 2015 AESC Study, Appendix B.[6] The values contained in the study reflect the avoided cost of peaking capacity, and incorporate a reserve margin and losses incurred from the generator to the point of delivery to the distribution companies. ISO-New England reserve margins are incorporated into the capacity values,

[5] The notation "@Life" in the equation for value for this and other value components is an indication that the avoided value component for each benefit (e.g., electric energy, capacity, natural gas, etc.) is the cumulative net present value (in 2017 dollars) of avoided costs for each year of the planning horizon from the base year over the life of the measure. For example, the avoided value component for a measure with an expected life of ten years for any given benefit component is the sum of the net present value of the annual avoided costs for that component in Year 1, Year 2, Year 3, etc., through Year 10.

[6] The values for Rhode Island have also been included as Table E-9 in Appendix 5

since energy efficiency avoids the back-up reserves for that generation as well as the generation itself. A loss factor representing losses from the ISO delivery point to the end-use customer is used as a multiplier, since those losses are not included in the avoided costs. Demand savings are calculated to be coincident with the ISO-NE definition of peak.

The dollar value of benefits are therefore calculated as:

- Generation Capacity Benefit($) = kW_{Summer}*GenerationCapValue$/$kW_{(@Life)}$ * (1 + $\%Losses_{SummerkW}$)

3) Electric Transmission Capacity and Distribution Capacity Benefits.

Avoided transmission and distribution capacity values are appropriate for inclusion in the TRC test. When transmission and distribution facilities do not have to be built or can be deferred because of lower loads as a result of consumers' investments in energy efficiency, an avoided resource benefit is created.

Electric transmission capacity and distribution capacity benefits are valued in the TRC test using avoided transmission and distribution capacity values calculated in a spreadsheet tool that was developed in 2005 by ICF International, Inc., the consultant that performed the biennial avoided cost study for New England's energy efficiency program administrators in that year. The tool calculates an annualized value of statewide avoided transmission and distribution capacity values from company-specific inputs of historic and projected capital expenditures and loads, as well as a carrying charge calculated from applicable tax rates and Federal Energy Regulatory Commission (FERC) Form 1 accounting data.

Capacity loss factors are applied to the avoided T&D capacity costs to account for local transmission and distribution losses from the point of delivery to the distribution company's system to the ultimate customer's facility. Thus, losses will be accounted for from the generator to the end use customer.

T&D benefits could be allocated to summer and winter periods, depending on the relation between summer and winter peaks on the local system. However, the Company's system is summer peaking. Therefore, the T&D benefits will be exclusively associated with summer demand reduction and the dollar value will be calculated as follows:

- Transmission Benefit ($) = ($kW_{Summer}$ * Trans$/$kW_{(@Life)}$ * [1 + ($Losses_{SumkWTrans}$)]
- Distribution Benefit ($) = ($kW_{Summer}$ * Dist$/kWLife_{(@Life)}$ * [1 + ($Losses_{SumkWDist}$)]

4) Natural Gas Benefits

Avoided natural gas consumption is appropriate for inclusion in the TRC Test. When a project in which consumers have invested saves natural gas, an avoided resource benefit is created.

Natural gas benefits in the TRC Test will be valued using avoided natural gas values from the 2015 AESC Study, Appendix C[7]. These costs include commodity, transportation, and retail delivery charges that would be avoided by fuels not consumed by end users. In addition, the costs associated with future anticipated federal CO2 regulations may be avoided by natural gas energy efficiency. Estimates of this value, in $/MMbtu, were obtained from Exhibit 4-14 in the 2015 AESC Study In consultation with the Collaborative, the Company developed a methodology to add the greenhouse gas reduction benefit from reductions in natural gas usage resulting from the Company's energy efficiency programs.

The AESC Study Report presents avoided natural gas value components into end-use categories to match with individual program characteristics. The natural gas categories are:

- Commercial and industrial, non-heating. This assumes savings are constant throughout the year and averages monthly natural gas values over 12 months.
- Commercial and industrial, heating. Averages the monthly values for the months of November through March.
- Residential heating. Averages the monthly values for the months of November through March. As these months have the highest natural gas values, by averaging over a fewer number of months, natural gas savings in this category typically have the highest value.
- Domestic hot water. This assumes savings are constant throughout the year and averages monthly natural gas values over 12 months.

Using each of these end-use value components, the dollar value of fuel benefits is calculated as:

- Natural Gas Benefits ($) = MMBtu Gas Savings * (Gas$/MMBTU$_{(EndUseCategory,@Life)}$ +Greenhouse Gas $/MMBTU$_{(@Life)}$)

[7] The values for Rhode Island have also been included as Table G-9 in Appendix 5

5) Delivered Fuel Benefits

Avoided delivered fuel costs (natural gas, propane, or fuel oil) are appropriate for inclusion in the TRC Test. When a project in which consumers have invested saves fuel an avoided resource benefit is created.

Fuel benefits in the TRC Test are valued using avoided fuel values from the 2015 AESC Study, Appendix D. The fuel oil categories are Residential #2, Commercial #2, Commercial #4, and Commercial and Industrial #6.

Using each of these end-use value components, the dollar value of fuel benefits is calculated as:

- Fuel Benefits ($) = MMBTU_Fuel Savings * Fuel$/MMBTU$_{(EndUseCategory,@Life)}$

6) Water and Sewer Benefits

Water savings created from program efforts should be valued and included in the TRC Test. Water savings can be valued using avoided water and sewer values that are based on average water and sewer rates in Rhode Island. While there are no specific water efficiency measures, when a project in which consumers have invested to save electricity or fuel also affects water consumption—for example, a cooling tower project that reduces makeup water needed—a resource benefit is created. Depending on the project and metering configuration, changes in water consumption may also affect sewerage billings.

Water and sewerage rates were determined from an August 2014 internet survey of rates posted by the City of Providence[8] and the Narragansett Bay Commission[9].

Water and sewer benefits are counted for all projects, where appropriate, and calculated as follows:

- Water and Sewerage Benefits ($) = Water and/or Sewerage Savings * Water and/or Sewer $/Gal$_{(@Life)}$

[8] Water Rates." Providence Water Supply Board. 2014.

<http://www.provwater.com/depts/cs/billrates.htm>

[9] "Rates." Narragansett Bay Commission. 2014.

<http://www.narrabay.com/en/Customer%20Service/Rates.aspx>

7) Non-Energy Impacts

Other quantifiable non-resource or non-energy impacts may be created as a direct result of Least Cost Procurement efforts and, are therefore appropriate for inclusion in the TRC Test. Non-energy impacts are typically associated with the number of measures installed, rather than the energy consumption of the equipment. They may be positive or negative. They may be one time benefits or recur annually. These effects will be included when they are a direct result of the measure and when they are quantifiable and avoidable.

The specific values of non-energy impacts used in the 2017 EEPP for prescriptive measures are documented in the 2017 RI Technical Reference Manual. Non-energy impacts may include – but are not limited to – labor, material, facility use, health and safety, materials handling, property values, and transportation. For low income measures, non-energy impacts also include the impacts of having lower energy bills to pay, such as reduced arrearages or avoided utility shut off costs. Non-energy impacts for Commercial and Industrial custom measures are counted when supported by site specific engineering calculations or other analyses.

The dollar value of non-resource benefits will be calculated as follows

- One-time Non-energy impacts ($) = Non-energy impact ($)/unit * Number of units
- Annual Non-energy impacts ($) = Non-energy impact ($)/unit * Number of units * Present Worth Factor$_{(@Life)}$

8) Price Effects

The Demand-Reduction-Induced Price Effect (DRIPE) is the reduction in prices in energy and capacity markets resulting from the reduction in need for energy and/or capacity due to efficiency and/or demand response programs. Consumers' investments in energy efficiency avoid both marginal energy production and capital investments, but also lead to structural changes in the market due to lower demand. Over a period of time, the market adjusts to lower demand, but until that time the reduced demand leads to a reduction in the market price of electricity. This is the observed in the New England market when ISO-New England activates its price response programs. When this price effect is a result of consumers' investments in energy efficiency, it is appropriate to include it in the TRC Test.

DRIPE effects are very small when expressed in terms of an impact on market prices, i.e., reductions of a fraction of a percent. However, the DRIPE impacts are significant

when expressed in absolute dollar terms over all the kWh transacted in the market. Very small impacts on market prices, when applied to all energy and capacity being purchased in the market, translate into large absolute dollar amounts.

DRIPE values developed for energy efficiency installations in 2017 from the 2015 AESC Study are used in the TRC test. The price effects are expressed as $/kWh for each of the four energy costing periods, $/kW for capacity, and $/MMBtu for natural gas. In addition, there are cross fuel effects that are counted for when natural gas energy efficiency affects the price of electricity. For example, homes and generators compete for natural gas in winter. Scarcity of natural gas for generation may drive up the cost of electricity. Therefore, reduction in natural gas consumption due to energy efficiency may cause a price effect for electricity. (Even though the price effect is in electricity, that DRIPE benefit is converted to $/MMBtu so that it can be attributed to the gas savings that create the effect.) The DRIPE benefit is calculated as:

- Summer Peak Energy DRIPE Benefit ($) = kWh * $Energy\%_{SumPk}$ * ($SummerPkDRIPE\$/kWh_{(@Life}$+$ElectricGasDRIPE\$/kWh_{)}$ * (1 + $\%Losses_{SummerPk\text{-}kWh}$)
- Summer OffPeak Energy DRIPE Benefit ($) = kWh * $Energy\%_{SumOffPk}$ * ($SumOffPkDRIPE\$/kWh_{(@Life}$ +$ElectricGasDRIPE\$/kWh_{)}$ * (1 + $\%Losses_{SummerOffPk\text{-}kWh}$)
- Winter Peak Energy DRIPE Benefit ($) = kWh * $Energy\%_{WinterPk}$ * ($WinterPkDRIPE\$/kWh_{(@Life}$+$ElectricGasDRIPE\$/kWh_{)}$ * (1 + $\%Losses_{WinterPk\text{-}kWh}$)
- Winter OffPeak Energy DRIPE Benefit ($) = kWh * $Energy\%_{WinOffPk}$ * ($WinterOffPkDRIPE\$/kWh_{(@Life}$+$ElectricGasDRIPE\$/kWh_{)}$ * (1 + $\%Losses_{WinterOffPk\text{-}kWh}$)
- Generation Capacity DRIPE Benefit($) = kW_{Summer} * $CapDRIPEValue\$/kW_{(@Life)}$ * (1 + $\%Losses_{SummerkW}$)
- Natural Gas DRIPE Benefit ($) = MMBTU_Fuel Savings * ($GasDRIPEValue\$/MMBTU_{(@Life)}$ +GasElectricDRIPE$/MMBtu)

9) CHP Benefits

R.I.Gen.Laws §39-1-27.7(c) (6) (iii) directs the Company to support the development of combined heat and power (CHP). In addition, the law requires that the following criteria be factored into the Company's CHP plan: (i) economic development benefits in Rhode Island; (ii) energy and cost savings for customers; (iii) energy supply costs; (iv) greenhouse gas emissions standards and air quality benefits; and (v) system reliability

benefits. [10] Of these, energy and cost savings and energy supply costs are captured in the energy benefits described above. The other three benefits – economic development, greenhouse gas, and system reliability benefits – are described here.

Economic Development

For all CHP projects, net economic development benefits will be counted as benefits. The rate of economic development benefit will be $2.73 of lifetime gross state product increase per dollar of program investment, based on the report, "Macroeconomic Impacts of Rhode Island Energy Efficiency Investments: REMI Analysis of National Grid's Energy Efficiency Programs, prepare by National Grid in August 2014, as an update to the 2009 study "Energy Efficiency in Rhode Island: Engine of Economic Growth," prepared by Environment Northeast[11]. The $2.73 multiplier reflects the present value of lifetime gross state product effects. Therefore, the CHP Economic Development benefits will be calculated as:

- Incentive payment($) x $2.73

Greenhouse gas reduction benefits

For all CHP projects, greenhouse gas mitigation and air quality benefits will be counted as benefits to the extent they are not already captured in the BCR screening values and to the extent that usable emissions data is available. The emissions profile of the CHP site facility prior to the installation of the retrofit (most likely a combination of grid supplied generation for electricity and an on-site boiler for thermal needs) will be compared to the emissions post-retrofit (most likely the CHP unit alone). The change in emissions in tons will be multiplied by a value of $/ton for each pollutant and the values will be summed over all pollutants and counted as a benefit in the benefit/cost calculation. This method is contingent on having emissions data for all pollutants. This information is often difficult to come by; for example, ISO-New England annually publishes emissions per kWh for only SOx, NOx, and CO2. Similarly, the amount of emissions for all pollutants associated with a particular CHP unit is not always provided.

When the change in the mount of pollutants has been identified, the environmental/emissions related health costs and benefits will be estimated using methods that connects emissions to monetary damages and are accepted nationally, such as the Co-benefits Risk Assessment (COBRA) Screening Model presented by the

[10] See R.I. Gen.Laws § 39-1-27.7(c) (6) (iii).

[11] The report does not differentiate between job creation and job retention benefits. The Company will attempt to assess whether these benefits can be disaggregated for the purposes of inclusion in the benefit cost test.

U.S. EPA or AP2[12]. The following table, updated for this plan, illustrates the benefits on a per ton basis resulting from the mitigation of several pollutants in Rhode Island from an analysis[13] using a predecessor to the AP2 model, which is an integrated analysis through six modules: emissions, air quality modeling, concentrations, exposures, physical effects, and valuation.

Statewide Health Benefits from One Ton Reduction of Each Pollutant in Indicated

Pollutant	VOC	NH3	NOx	SO2	Fine PM	Coarse PM
$Value/ ton	$204	$1,019	$283	$1,981	$7,076	$192

Value from mitigation of CO2 under enacted legislation in Rhode Island is already embedded in avoided energy costs in benefit-cost analysis.

System Reliability

If a CHP project is proposed in a system reliability target area, the system reliability benefits from deferring a distribution system upgrade would be captured in the System Reliability Procurement report. In the context of CHP located elsewhere in the state, system reliability benefits are the local distribution benefits created by the introduction of the CHP unit in the local area. Notably, CHP projects do not produce the same level of deferred distribution investment savings described in Section (3) above as traditional energy efficiency.[14] Accordingly, the distribution benefits are modified as follows

- For CHP systems of less than 1 MW net capacity, the distribution deferral benefit value estimated by the Company based on system wide averages will be

[12] Muller, N.Z. 2011. Linking Policy to Statistical Uncertainty in Air Pollution Damages. The B.E. Press Journal of Economic Analysis and Policy. Vol. 11(1), Contributions, Article 32.

[13] "Weighing the Value of a Ton of Pollution," Nicholas Z. Muller and Robert Mendelsohn, Cato Institute, http://object.cato.org/sites/cato.org/files/serials/files/regulation/2010/6/regv33n2-5.pdf, accessed 8/20/2015. This article presents national median values for the listed pollutants as a result of an analysis of 60,000 simulation runs. Graphical presentation allows for the identification of values for RI for fine particulate matter and SOx. For the other pollutants, the median value is used, although the value for Rhode Island is higher than the median for FPM and SOx.

[14] With traditional energy efficiency projects, the installed measures permanently reduce load on the electric distribution system and, therefore, reduce the need to make distribution investments. CHP projects may not result in similar deferred distribution investment savings. A CHP unit may not be available at all peak times, and, absent any contractual or mechanical modification to ensure that the load does not reappear, the Company will still need to design and maintain the distribution system for when that unit goes off line during a peak hour on a peak day. This is particularly significant with larger CHP projects, in which a single host customer represents a significant percentage of the total load on a feeder. With multiple smaller units, some level of savings is possible, but these units are still not likely to produce distribution benefits in the same manner as traditional energy efficiency.

multiplied by 0.75 to incorporate an estimate of the reliability experience of discrete deployment of CHP units compared with end-use reduction efficiency measures which are spread across the state;[15]

- For CHP systems equal to or greater than 1 MW net capacity, the distribution benefit will consider location-specific distribution benefits, as opposed to average system-wide benefits. The results of this analysis will replace the adjusted 0.75 of average system-wide distribution benefit described for CHP projects of less than 1 MW. This may entail a detailed engineering analysis performed by the Company, and additional costs. This consideration will have two parts: 1) identification of foreseeable investments that the CHP installation could potentially help defer, and their value; and 2) whether the unit will be sufficiently reliable, or firmed through the provision of physical assurance by the customer, to enable such savings to be realized
- For CHP projects greater of 1 net MW or greater, gas system benefits not paid out as incentives to the Customer via the AGT incentive or gas service contract terms will be counted as benefits.[16]

10) Utility Costs

Utility costs incurred to achieve implementation of energy efficiency measures and programs are appropriate for inclusion in the TRC Test. These costs have been categorized as follows:

- Program Planning and Administration (PP&A): These costs are the administrative costs associated with the utility role in program delivery, including payroll, information technology, contract administration, and overhead expenses.
- Sales, training of program delivery personnel and technical assistance.
- Marketing: These are the costs of marketing and advertising to promote a program. The costs also include the payroll and expenses to manage marketing.

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[15] As explained in footnote 12, *supra*, while multiple small CHP units may produce some level of savings, these units are still not likely to produce distribution benefits in the same manner as traditional energy efficiency. Therefore, the 0.75 factor is adopted as a planning assumption to represent the contingency that, when a single CHP unit on a feeder fails to perform, the load reappears on the system. As more CHP units, particularly smaller units, are deployed in the state, the diversity of operation may allow the adjustment factor to be increased. The Company intends to review this planning assumption based on actual experience for future EE Program Plan filings.

[16] For example, a 3 MW installation with an additional sales volume of approximately 150,000 Dth per year would generate approximately $130,000 of marginal revenue per year under current rates. Assuming $100,000 of capital costs, the project could qualify for up to $573,000 in AGT funding, subject to budget limitations.

- Rebates and Other Customer Incentives: These are the incentives from the programs to customers to move them to install energy efficient equipment. Incentives include, but are not limited to, rebates to customers, copayments to vendors for direct installation of measures, payments to distributors to buy down the cost of their products for sale in retail stores, payments to vendors to create and deliver information, the cost of an education course, or payments to lenders to buy down the interest in a loan. Customer incentives typically cover a portion of the equipment and installation costs directly associated with the energy efficient equipment being installed.[17] For a retrofit project, the customer incentives cover a portion of the full cost of the efficiency project, as it is assumed that the alternative to the project is no customer action. For a failed equipment replacement/renovation/new construction project, these customer incentives cover a portion of the incremental additional costs associated with moving to a higher efficiency item or practice compared to what the customer would have done otherwise.
- Sales, Technical Assistance and Training (STAT): These costs include the training and education of the trade ally community regarding the company's current energy efficiency programs. Examples of trade allies include but are not limited to: equipment vendors, heating contractors, lead vendors, project expediters, weatherization contractors, and equipment installers. These costs also include the tasks associated with internal and contractual delivery of programs. Tasks associated with this budget category include but are not limited to: lead intake, customer service, rebate application, quality assurance, technical assessments, engineering studies, plan reviews, payroll and expenses.
- Evaluation. These are the costs of evaluation or market research studies to support program direction and post-installation studies to study program effectiveness or verification of savings estimates. These costs also include the payroll and expenses to manage the research.
- Shareholder Incentive. This is the incentive received by the Company for meeting specified savings goals and/or performance targets; because the Company would not implement energy efficiency programs to the extent it does without the incentive, the shareholder incentive is included in the cost of energy efficiency.

[17] The full cost of the efficiency project is not necessarily the same thing as the full cost of the project being undertaken by the customer. For example, a customer may be renovating an HVAC system including installation of a new chiller and chilled water distribution. While the new distribution system may be part of the construction project, if it does not contribute to energy savings, it will not be included in the efficiency project cost; only the incremental cost of the new efficient chiller will be considered.

11) Customer Costs

The customer's costs include their contribution to the installation cost of the efficient measure. Typically, this is the portion of the equipment and installation cost not covered by the customer incentive. As noted above, it excludes the cost of equipment that might be part of the customer's construction project, but that is not related to the energy efficiency portion of the project.

Benefit/Cost Calculations

The cost effectiveness of a measure, program, or portfolio is simply the ratio of the net present value of the benefits to the net present value of the costs.

For the 2017 EE Program Plan, all costs and benefits will be expressed in constant 2017 dollars. Where escalation of avoided costs or costs is needed to produce values in 2017 dollars, appropriate inflation rates are used.

The avoided value component for each benefit (e.g., electric energy, capacity, natural gas, etc.) is the cumulative net present value (in 2017 dollars) of lifetime avoided costs for each year of the planning horizon from the base year up to the measure life of the equipment. Since all of the future year values are in constant 2017 dollars, lifetime benefits thus calculated are discounted back to mid-2017 using a real discount rate equal to [(1 + Nominal Discount Rate) / (1 + Inflation)] - 1.

As prescribed by the Standards, all values in the Plan and the benefit-cost model are stated in present value terms, "using a discount rate that appropriately reflects the risks of the investment of customer funds in energy efficiency; in other words, a low-risk discount rate which would indicate that energy efficiency is a low-risk resource in terms of cost of capital risk, project risk, and portfolio risk". Specifically for the 2017 Plan, the Company used a real discount rate of 0.45% equal to the twelve-month average of the historic yields from a twenty-year United States Treasury note, using the 2015 calendar year to determine the twelve-month average.

The total benefits will equal the sum of the NPV of each benefit component:

> [Energy Benefits + Generation Capacity Benefits + Avoided T&D Benefits + Natural Gas Benefits + Fuel Benefits + Water & Sewer Benefits + Non-Resource Benefits + Price Effects Benefits]

The total costs will equal the sum of the NPV of each cost component:

[Program Planning and Administration + Sales, Training, Technical assistance + Marketing + Rebates and Other Customer Incentives + Evaluation + Shareholder incentive+ Customer Cost]

The TRC benefit/cost will then equal:

Total NPV Benefits/Total NPV Costs

Per the Standards, on a program level, all benefit categories are included in the benefit/cost calculation. All cost categories, except the shareholder incentive, are included at the program level because they are tracked at that level.[18]

On a sector level, the cost of pilots and educational/outreach programs which are not focused on producing savings and the projected shareholder incentive, are included with the other costs in the determination of cost effectiveness. The shareholder incentive is included at this level because it is designed to achieve savings targets by sector. At a portfolio level, the allocations to the Office of Energy Resources and EERMC are also included in the cost effectiveness calculation.

Separate calculations of benefits and cost-effectiveness are provided for the electric energy efficiency programs and natural gas energy efficiency programs. Some electric energy efficiency programs are expected to produce natural gas savings in addition to electricity savings while some natural gas energy efficiency programs are expected to produce electricity savings in addition to natural gas savings. All of the resource benefits produced by a program are shown with that program. For example, an HVAC project that improves air distribution incented through the electric Large C&I Retrofit Program will produce natural gas savings when natural gas is used by the participant for heating.

[18] Commitments, if any, of customer incentives made from one year to the next are excluded from the program costs used in the benefit/cost calculation. The costs are only counted in the year in which the incentive is paid and the savings are counted.

ATTACHMENT 5

Table E-1
National Grid
Electric DSM Funding Sources in 2017 by Sector
$(000)

		Projections by Sector			
		Income Eligible Residential	**Non-Income Eligible Residential**	**Commercial & Industrial**	**Total**
(1)	**Projected Budget (from E-2):**	**$12,636.06**	**$33,996.68**	**$47,935.85**	**$94,568.59**
	Sources of Other Funding:				
(2)	Projected DSM Commitments at Year-End 2017:	$0.00	$0.00	$0.00	$0.00
(3)	Projected Year-End 2017 Fund Balance and Interest:	$0.00	($2,677.64)	$0.00	($2,677.64)
(4)	Projected FCM Payments from ISO-NE:	$447.40	$4,483.40	$7,101.00	$12,031.84
(5)	Projected RGGI Payments:	$74.70	$748.80	$1,185.90	$2,009.45
(6)	**Total Other Funding:**	**$522.10**	**$2,554.56**	**$8,286.90**	**$11,363.65**
(7)	**Customer Funding Required:**	**$12,113.96**	**$31,442.11**	**$39,648.95**	**$83,204.93**
(8)	**Forecasted kWh Sales:**	**279,047,785**	**2,796,094,708**	**4,428,550,287**	**7,503,692,780**
(9)	Energy Efficiency Program charge per kWh, excluding uncollectible recovery:				**$0.01108**
(10)	Proposed System Reliability Factor per kWh, excluding uncollectible recovery:				$0.00002
(11)	Total Proposed Energy Efficiency Charge per kWh, excluding uncollectible recovery:				$0.01110
(12)	Currently Effective Uncollectible Rate				1.25%
(13)	**Energy Efficiency Program charge per kWh, including uncollectible recovery:**				$0.01124
(14)	Currently Effective EE Charge				$0.01077
(15)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism				$0.00047

Notes:
(1) Projected Budget from E-2 includes OER and EERMC costs allocated to each sector based on forecasted sales and RIIB costs allocated to C&I sector.
(2) DSM Commitments are projects that are under construction with anticipated completion in 2017.
(3) Fund balance projections include projected revenue and spend through year end with Low Income sector set to $0 through projected subsidization from other sectors, minus commitments which are illustrated separately on line (3).
(4) & (5) The total projection of FCM and RGGI revenues are allocated by kWh sales to each sector.
(5) The Projected RGGI Payments are consistent with the state's 2016-B Plan for the Allocation and Distribution of RGGI Auction proceeds.
(8) Projected street lighting and sales for resale kWh have been allocated to each sector based on the forecasted of sales in each sector excluding expected street lighting sales.
(10) Proposed System Reliability Factor is from the 2017 System Reliability Procurement Plan.
(14) Currently Effective EE Charge includes System Reliability Factor and uncollectible recovery.

Table E-2
National Grid
2017 Electric Energy Efficiency Program Budget ($000)

	Program Planning & Administration	Marketing	Rebates and Other Customer Incentives	Sales, Technical Assistance & Training	Evaluation & Market Research	Shareholder Incentive	Grand Total
Non-Income Eligible Residential							
Residential New Construction	$136.1	$5.9	$433.6	$230.6	$239.2		$1,045.3
ENERGY STAR® HVAC	$107.3	$123.7	$1,018.0	$406.2	$14.4		$1,669.5
Energy*Wise*	$387.9	$410.0	$8,650.0	$35.1	$146.9		$9,630.0
Energy*Wise* Multifamily	$123.9	$45.8	$2,442.1	$730.3	$101.4		$3,443.5
ENERGY STAR® Lighting	$299.5	$507.7	$8,223.8	$267.1	$114.4		$9,412.4
Residential Consumer Products	$154.5	$551.4	$735.0	$671.5	$12.7		$2,125.0
Home Energy Reports	$113.2	$13.5	$2,198.2	$18.1	$104.0		$2,447.0
Energy Efficiency Education Programs	$0.0	$40.0	$0.0	$0.0	$0.0		$40.0
Residential Demonstration and R&D	$54.6	$60.9	$335.5	$357.0	$371.5		$1,179.5
Community Based Initiatives - Residential	$10.2	$42.9	$43.5	$173.8	$0.5		$270.8
Comprehensive Marketing - Residential	$14.1	$518.0	$0.0	$2.4	$0.9		$535.4
Residential Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$1,589.9	$1,589.9
Subtotal - Non-Income Eligible Residential	**$1,401.1**	**$2,319.7**	**$24,079.6**	**$2,892.0**	**$1,105.9**	**$1,589.9**	**$33,388.4**
Income Eligible Residential							
Single Family - Income Eligible Services	$362.5	$155.2	$6,966.7	$1,615.2	$168.4		$9,268.1
Income Eligible Multifamily	$116.6	$12.9	$2,023.4	$488.0	$67.5		$2,708.4
Income Eligible Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$598.8	$598.8
Subtotal - Income Eligible Residential	**$479.1**	**$168.1**	**$8,990.2**	**$2,103.2**	**$235.9**	**$598.8**	**$12,575.4**
Commercial & Industrial							
Large Commercial New Construction	$457.4	$362.1	$2,936.4	$1,240.9	$124.5		$5,121.4
Large Commercial Retrofit	$907.2	$312.7	$18,218.2	$3,962.8	$307.5		$23,708.4
Small Business Direct Install	$498.1	$356.9	$6,671.1	$932.5	$372.9		$8,831.4
Commercial Demonstration and R&D	$6.9	$20.6	$365.0	$481.4	$0.5		$874.4
Finance Costs	$0.0	$0.0	$1,300.0	$0.0	$0.0		$1,300.0
RI Infrastructure Bank	$0.0	$0.0	$4,900.0	$0.0	$0.0		$4,900.0
Commercial & Industrial Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$2,236.78	$2,236.8
Subtotal - Commercial & Industrial	**$1,869.6**	**$1,052.3**	**$34,390.7**	**$6,617.5**	**$805.4**	**$2,236.8**	**$46,972.4**
Regulatory							
OER	$816.3	$0.0	$0.0	$0.0	$0.0		$816.3
EERMC	$816.3	$0.0	$0.0	$0.0	$0.0		$816.3
Subtotal - Regulatory	**$1,632.5**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$1,632.5**
Grand Total	**$5,382.4**	**$3,540.2**	**$67,460.5**	**$11,612.8**	**$2,147.3**	**$4,425.5**	**$94,568.6**
Incremental System Reliability	$50.0	$80.0	$31.2	$118.1	$120.0	$0.0	$399.3

Notes:

(1) 2017 Commitments are anticipated to be $0.

(2) For more information on Finance Costs, please refer to the 2017 C&I Program Description, Attachment 2.

(3) OER and EERMC total 2.0% of customers' EE Program Charge collected on Table E-1, minus 2%.

(4) Incremental System Reliability funds are included for illustrative purposes. They are part of the 2017 System Reliability Procurement Report, filed as a separate docket.

Table E-3
National Grid
Derivation of the 2017 Spending and Implementation Budgets ($000)

	Proposed 2017 Budget From E-2	Regulatory Costs	Shareholder Incentive	Eligible Sector Spending Budget for Shareholder Incentive on E-9	Implementation Expenses for Cost-Effectiveness on E-5
Non-Income Eligible Residential					
Residential New Construction	$1,045.3				$1,045.3
ENERGY STAR® HVAC	$1,669.5				$1,669.5
EnergyWise	$9,630.0				$9,630.0
EnergyWise Multifamily	$3,443.5				$3,443.5
ENERGY STAR® Lighting	$9,412.4				$9,412.4
Residential Consumer Products	$2,125.0				$2,125.0
Home Energy Reports	$2,447.0				$2,447.0
Energy Efficiency Education Programs	$40.0				$40.0
Residential Demonstration and R&D	$1,179.5				$1,179.5
Community Based Initiatives - Residential	$270.8				$270.8
Comprehensive Marketing - Residential	$535.4				$535.4
Residential Shareholder Incentive	$1,589.9		$1,589.9		$0.0
Subtotal - Non-Income Eligible Residential	**$33,388.4**	**$0.0**	**$1,589.9**	**$31,798.4**	**$31,798.4**
Income Eligible Residential					
Single Family - Income Eligible Services	$9,268.1				$9,268.1
Income Eligible Multifamily	$2,708.4				$2,708.4
Income Eligible Shareholder Incentive	$598.8		$598.8		$0.0
Subtotal - Income Eligible Residential	**$12,575.4**	**$0.0**	**$598.8**	**$11,976.5**	**$11,976.5**
Commercial & Industrial					
Large Commercial New Construction	$5,121.4				$5,121.4
Large Commercial Retrofit	$23,708.4				$23,708.4
Small Business Direct Install	$8,831.4				$8,831.4
Commercial Demonstration and R&D	$874.4				$874.4
Finance Costs	$1,300.0				$1,300.0
RI Infrastructure Bank	$4,900.0				$4,900.0
Commercial & Industrial Shareholder Incentive	$2,236.8		$2,236.8		$0.0
Subtotal - Commercial & Industrial	**$46,972.4**	**$0.0**	**$2,236.8**	**$44,735.6**	**$44,735.6**
Regulatory					
OER	$816.3	$816.3			$816.3
EERMC	$816.3	$816.3			$816.3
Subtotal - Regulatory	**$1,632.5**	**$1,632.5**	**$0.0**	**$0.0**	**$1,632.5**
Grand Total	**$94,568.6**	**$1,632.5**	**$4,425.5**	**$88,510.6**	**$90,143.1**

Notes:

(1) Spending budget = Total Budget from E-2 minus Regulatory costs, and shareholder incentive.

(2) Implementation Expenses = Total Budget from E-2 minus shareholder incentive.

Table E-4
National Grid
Proposed 2017 Budget Compared to Approved 2016 Budget ($000)

	Proposed Implementation Budget 2017	Approved Implementation Budget 2016	Difference
Non-Income Eligible Residential			
Residential New Construction	$1,045.3	$736.9	$308.4
ENERGY STAR® HVAC	$1,669.5	$1,219.0	$450.5
Energy*Wise*	$9,630.0	$9,007.7	$622.3
Energy*Wise* Multifamily	$3,443.5	$3,319.1	$124.3
ENERGY STAR® Lighting	$9,412.4	$7,362.1	$2,050.4
Residential Consumer Products	$2,125.0	$2,085.0	$40.0
Home Energy Reports	$2,447.0	$2,796.7	-$349.8
Energy Efficiency Education Programs	$40.0	$40.1	-$0.1
Residential Demonstration and R&D	$1,179.5	$488.1	$691.4
Community Based Initiatives - Residential	$270.8	$284.4	-$13.6
Comprehensive Marketing - Residential	$535.4	$534.0	$1.4
Subtotal - Non-Income Eligible Residential	**$31,798.4**	**$27,873.1**	**$3,925.3**
Income Eligible Residential			
Single Family - Income Eligible Services	$9,268.1	$8,656.1	$612.0
Income Eligible Multifamily	$2,708.4	$2,531.3	$177.1
Subtotal - Income Eligible Residential	**$11,976.5**	**$11,187.4**	**$789.1**
Commercial & Industrial			
Large Commercial New Construction	$5,121.4	$6,864.1	-$1,742.7
Large Commercial Retrofit	$23,708.4	$22,545.5	$1,162.9
Small Business Direct Install	$8,831.4	$8,745.9	$85.5
Community Based Initiatives - C&I	$0.0	$49.6	-$49.6
Commercial Demonstration and R&D	$874.4	$296.2	$578.2
Finance Costs	$1,300.0	$3,000.0	-$1,700.0
RI Infrastructure Bank	$4,900.0	$1,441.5	$3,458.5
Subtotal Commercial & Industrial	**$44,735.6**	**$42,942.7**	**$1,792.9**
Regulatory			
EERMC	$816.3	$793.1	$23.2
OER	$816.3	$793.1	$23.2
Subtotal Regulatory	**$1,632.5**	**$1,586.2**	**$46.3**
TOTAL IMPLEMENTATION BUDGET	**$90,143.1**	**$83,589.4**	**$6,553.6**
OTHER EXPENSE ITEMS			
Commitments	$0.0	$0.0	$0.0
Company Incentive	$4,425.5	$3,878.1	$547.4
Subtotal - Other Expense Items	**$4,425.5**	**$3,878.1**	**$547.4**
TOTAL BUDGET	**$94,568.6**	**$87,467.5**	**$7,101.1**

Notes:

(1) Program Implementation Budget excludes Commitments, Company Incentive; derived on Table E-3

(2) Total Budget includes Implementation, Commitments; illustrated on Table E-3

(3) RI Infrastructure Bank expenses are now included as part of Commercial and Industrial expenses. In 2016 these expenses were included in Regulatory but have been moved to Commercial & Industrial for the purposes of this table to show a true comparison.

Table E-5
National Grid
Calculation of 2017 Program Year Cost-Effectiveness
All Dollar Values in ($000)

	TRC Benefit/ Cost[1]	Total Benefit	Program Implementation Expenses[2]	Customer Contribution	Shareholder Incentive	¢/Lifetime kWh
Non-Income Eligible Residential						
Residential New Construction	1.73	$ 1,852.2	$ 1,045.3	$ 25.0		6.6
ENERGY STAR® HVAC	1.37	$ 3,060.5	$ 1,669.5	$ 569.6		12.4
Energy*Wise*	1.09	$ 12,667.4	$ 9,630.0	$ 1,968.8		16.6
Energy*Wise* Multifamily	1.74	$ 6,913.1	$ 3,443.5	$ 538.8		11.1
Home Energy Reports	1.02	$ 2,504.3	$ 2,447.0	$ -		9.3
ENERGY STAR® Lighting	1.95	$ 29,224.5	$ 9,412.4	$ 5,608.8		3.8
Residential Consumer Products	1.26	$ 3,482.9	$ 2,125.0	$ 639.8		8.1
Energy Efficiency Education Programs		$ -	$ 40.0	$ -		
Residential Demonstration and R&D		$ -	$ 1,179.5	$ -		
Community Based Initiatives - Residential		$ -	$ 270.8	$ -		
Comprehensive Marketing - Residential		$ -	$ 535.4	$ -		
n-Income Eligible Residential SUBTOTAL	**1.40**	**$ 59,704.9**	**$ 31,798.4**	**$ 9,350.9**	**$ 1,589.9**	**7.0**
Income Eligible Residential						
Single Family - Income Eligible Services	3.80	$ 35,232.6	$ 9,268.1	$ -		20.0
Income Eligible Multifamily	2.69	$ 7,294.1	$ 2,708.4	$ -		9.7
Income Eligible Residential SUBTOTAL	**3.38**	**$ 42,526.7**	**$ 11,976.5**	**$ -**	**$ 598.8**	**16.1**
Commercial & Industrial						
Large Commercial New Construction	4.55	$ 23,281.0	$ 5,121.4	$ -		2.2
Large Commercial Retrofit	2.54	$ 105,858.8	$ 23,708.4	$ 18,010.9		4.1
Small Business Direct Install	1.50	$ 16,500.4	$ 8,831.4	$ 2,172.9		7.6
Commercial Demonstration and R&D		$ -	$ 874.4	$ -		
Finance Costs		$ -	1,300			
RI Infrastructure Bank			4,900			
C&I SUBTOTAL	**2.17**	**$ 145,640.2**	**$ 44,735.6**	**$ 20,183.7**	**$ 2,236.8**	**4.6**
Regulatory						
OER			$ 816.3			
EERMC			$ 816.3			
Regulatory SUBTOTAL			**$ 1,632.5**			
TOTAL	**2.00**	**$ 247,871.8**	**$ 90,143.1**	**$ 29,534.6**	**$ 4,425.5**	**5.8**

Notes:
(1) TRC B/C Test = (Energy + Capacity + Resource Benefits) / (Program Implementation + Customer Contribution + Shareholder Incentive)
Also includes effects of free-ridership and spillover.
(2) For Implementation Expenses derivation, see Table E-3.
(3) System Reliability may leverage some of the energy efficiency savings and benefits. Energy efficiency savings and benefits are attributed to the program in which they occur. The incremental costs and benefits of System Reliability appear below along with the resulting Total in order to illustrate that the existing Energy Efficiency programs are cost effective with the additional expenses. For more information please see the 2017 System Reliability Procurement Report for a full benefit cost analysis.

System Reliability Procurement		$ 195.2	$ 399.3	$ 1.0	$ -	
Total with System Reliability	1.99	$ 248,067.1	$ 90,542.4	$ 29,535.6	$ 4,425.5	6.0

Table E-6
National Grid
Summary of 2017 Benefits and Savings by Program

	Benefits (000's)													Load Reduction in kW			MWh Saved		MMBtu of Oil	
		Capacity					Energy					Non Electric								
		Generation					Winter		Summer								Maximum			
	Total	Summer	Winter	Trans	MDC	DRIPE	Peak	Off Peak	Peak	Off Peak	DRIPE	Resource	Non Resource	Summer	Winter	Lifetime	Annual	Lifetime	Annual	Lifetime
Non-Income Eligible Residential																				
Residential New Construction	$1,852	$123	$0	$8	$62	$0	$350	$354	$364	$212	$3	$316	$60	54	117	814	1,065	16,110	-	-
ENERGY STAR® HVAC	$3,061	$757	$0	$52	$378	$0	$381	$413	$359	$164	$4	$554	$0	330	532	4,959	1,376	18,018	-	-
Energy*Wise*	$12,667	$652	$0	$46	$336	$0	$2,204	$1,278	$1,024	$530	$18	$3,946	$2,633	376	981	4,386	6,545	69,886	8,579	170,147
Energy*Wise* Multifamily	$6,913	$438	$0	$31	$230	$0	$1,009	$945	$312	$262	$8	$942	$2,735	288	902	2,997	3,519	35,915	2,442	38,632
Home Energy Reports	$2,504	$298	$0	$34	$246	$0	$778	$626	$270	$201	$53	$0	$0	3,119	4,273	3,119	26,184	26,184	-	-
ENERGY STAR® Lighting	$29,225	$6,471	$0	$482	$3,533	$0	$12,174	$6,998	$5,426	$2,726	$126	-$11,951	$3,241	5,466	7,028	45,701	46,856	391,763	-	-
Residential Consumer Products	$3,483	$712	$0	$55	$400	$0	$741	$678	$453	$371	$12	$62	$0	705	677	5,156	4,708	33,949	-	-
Non-Income Eligible Residential SUBTOTAL	**$59,705**	**$9,452**	**$0**	**$707**	**$5,186**	**$0**	**$17,637**	**$11,291**	**$8,207**	**$4,466**	**$222**	**-$6,133**	**$8,669**	**10,337**	**14,510**	**67,134**	**90,254**	**591,825**	**11,021**	**208,779**
Income Eligible Residential																				
Single Family - Income Eligible Services	$35,233	$969	$0	$70	$511	$0	$1,385	$1,022	$597	$365	$11	$7,044	$23,259	652	794	6,646	4,350	46,339	15,768	306,287
Income Eligible Multifamily	$7,294	$220	$0	$16	$116	$0	$734	$700	$276	$238	$6	$625	$4,364	145	527	1,504	2,726	27,835	1,656	25,837
Income Eligible Residential SUBTOTAL	**$42,527**	**$1,189**	**$0**	**$85**	**$627**	**$0**	**$2,119**	**$1,722**	**$873**	**$602**	**$18**	**$7,668**	**$27,624**	**797**	**1,321**	**8,150**	**7,076**	**74,174**	**17,424**	**332,124**
Commercial & Industrial																				
Large Commercial New Construction	$23,281	$2,855	$0	$195	$1,431	$0	$7,390	$4,903	$3,645	$2,079	$38	$745	$0	1,276	906	18,720	14,270	233,957	-	-
Large Commercial Retrofit	$105,859	$23,559	$0	$1,658	$12,162	$0	$26,925	$24,430	$12,860	$10,173	$192	-$11,469	$5,368	13,317	12,858	158,463	77,611	1,020,139	-	-
Small Business Direct Install	$16,500	$5,017	$0	$354	$2,597	$0	$3,724	$3,333	$1,745	$1,379	$29	-$1,678	$0	2,815	2,758	33,783	12,136	145,636	-	-
C&I SUBTOTAL	**$145,640**	**$31,432**	**$0**	**$2,207**	**$16,190**	**$0**	**$38,039**	**$32,667**	**$18,250**	**$13,631**	**$259**	**-$12,402**	**$5,368**	**17,409**	**16,522**	**210,967**	**104,017**	**1,399,733**	**-**	**-**
TOTAL	**$247,872**	**$42,072**	**$0**	**$2,999**	**$22,002**	**$0**	**$57,795**	**$45,680**	**$27,330**	**$18,699**	**$499**	**-$10,867**	**$41,661**	**28,543**	**32,353**	**286,250**	**201,347**	**2,065,732**	**28,445**	**540,903**

Table E-7
National Grid
Comparison of 2016 and 2017 Goals

	Proposed 2017			Approved 2016		Difference	
	Annual Demand Savings (kW)	Annual Energy Savings (MWh)	Planned Unique Participants	Annual Demand Savings (kW)	Annual Energy Savings (MWh)	Annual Demand Savings (kW)	Annual Energy Savings (MWh)
Non-Income Eligible Residential							
Residential New Construction	54	1,065	561	83	1,213	-29	-148
ENERGY STAR® HVAC	330	1,376	1,900	235	1,011	95	365
Energy*Wise*	376	6,545	9,000	1,701	11,729	-1,326	-5,184
Energy*Wise* Multifamily	288	3,519	4,000	579	4,061	-291	-543
Home Energy Reports	3,119	26,184	208,063	3,759	32,186	-640	-6,002
ENERGY STAR® Lighting	5,466	46,856	279,425	3,620	43,098	1,846	3,758
Residential Consumer Products	705	4,708	14,700	696	4,647	9	61
Non-Income Eligible Residential SUBTOTAL	**10,337**	**90,254**	**517,648**	**10,673**	**97,947**	**-335**	**-7,693**
Income Eligible Residential							
Single Family - Income Eligible Services	652	4,350	2,625	554	4,061	98	289
Income Eligible Multifamily	145	2,726	2,894	366	2,830	-221	-104
Income Eligible Residential SUBTOTAL	**797**	**7,076**	**5,519**	**920**	**6,891**	**-123**	**185**
Commercial & Industrial							
Large Commercial New Construction	1,276	14,270	201	1,540	15,728	-264	-1,458
Large Commercial Retrofit	13,317	77,611	2,188	13,906	67,030	-589	10,581
Small Business Direct Install	2,815	12,136	744	2,507	12,165	309	-29
C&I SUBTOTAL	**17,409**	**104,017**	**3,133**	**17,953**	**94,922**	**-544**	**9,094**
TOTAL	**28,543**	**201,347**	**526,299**	**29,545**	**199,760**	**-1,003**	**1,586**

Notes:

(1) Planned 2017 particpation takes into account net-to-gross and estimates unique participation by taking into account 2015 unique customer accounts to savings ratios. Therefore the number of planned measures may be more than the estimated participants shown. For measure counts please view the widget tables in Attachments 1 and 2. Table E-7 no longer includes a comparison to the previous year's participation. Due to the way unique participation is calculated it is not possible to compare year-over-year results.

(2) There are additional Low Income participants in Residential New Construction.

(3) A customer can participate in more than one program, for example, ENERGY STAR® Lighting and Home Energy Reports, therefore the population reached can be more than 100%.

(4) Beginning in 2017, Home Energy Reports participation will be counted as the number of customers receiving reports (i.e., the “treatment group”) adjusted by the “Read Rate” of 75% from the most recent Customer Engagement Tracker Survey.

Table E-8
National Grid
Avoided Costs Used in 2017 Benefit-Cost Model

	Rhode Island					DRIPE for Installations in 2017				
	Winter Peak Energy	Winter Off-Peak Energy	Summer Peak Energy	Summer Off-Peak Energy	Annual Market Capacity Value	Winter Peak Energy	Winter Off-Peak Energy	Summer Peak Energy	Summer Off-Peak Energy	Annual Market Capacity Value
Units:	$/kWh	$/kWh	$/kWh	$/kWh	$/kW-yr	$/kWh	$/kWh	$/kWh	$/kWh	$/kW-yr
Period:										
2017	0.07	0.07	0.06	0.04	123.69	0.00	0.00	0.00	0.00	
2018	0.06	0.06	0.06	0.05	143.56	0.00	0.00	0.00	0.00	
2019	0.06	0.06	0.06	0.05	133.16					
2020	0.06	0.06	0.06	0.05	146.61					
2021	0.07	0.06	0.06	0.05	149.69					
2022	0.07	0.06	0.06	0.05	151.10					
2023	0.07	0.06	0.07	0.06	148.75					
2024	0.07	0.07	0.07	0.06	151.82					
2025	0.08	0.07	0.07	0.06	154.98					
2026	0.08	0.07	0.08	0.06	155.61					
2027	0.08	0.07	0.07	0.06	154.17					
2028	0.08	0.07	0.08	0.07	157.87					
2029	0.08	0.08	0.08	0.07	164.01					
2030	0.09	0.08	0.10	0.07	165.82					
2031	0.09	0.09	0.10	0.08	158.74					
2032	0.10	0.09	0.11	0.08	158.74					
2033	0.10	0.09	0.11	0.08	158.74					
2034	0.10	0.10	0.12	0.09	158.74					
2035	0.11	0.10	0.12	0.09	158.74					
2036	0.11	0.10	0.13	0.09	158.74					
2037	0.12	0.11	0.14	0.10	158.74					
2038	0.12	0.11	0.14	0.10	158.74					
2039	0.12	0.12	0.15	0.11	158.74					
2040	0.13	0.12	0.16	0.11	158.74					
2041	0.13	0.12	0.16	0.11	158.74					
2042	0.14	0.13	0.17	0.12	158.74					
2043	0.14	0.13	0.18	0.12	158.74					
2044	0.15	0.14	0.19	0.13	158.74					
2045	0.15	0.14	0.19	0.14	158.74					

Table E-9
National Grid
2017 Targeted Shareholder Incentive

Energy Incentive Rate: 3.50%

Sector	(1) Spending Budget $(000)	(2) Target Incentive $(000)	(3) Annual kWh Savings Goal	(4) Threshold kWh Savings	(5) Target Incentive Per kWh
Income Eligible Residential	$11,977	$419	7,076,222	5,307,166	$0.059
Non-Income Eligible Residential	$31,798	$1,113	90,253,592	67,690,194	$0.012
Commercial & Industrial	$44,736	$1,566	104,016,753	78,012,564	$0.015
Total	$88,511	$3,098	201,346,566	151,009,925	$0.015

Demand Incentive Rate: 1.50%

Sector	(6) Spending Budget $(000)	(7) Target Incentive $(000)	(8) Annual kW Savings Goal	(9) Threshold kW Savings	(10) Target Incentive Per kW
Income Eligible Residential	$11,977	$180	797	597	$225.527
Non-Income Eligible Residential	$31,798	$477	10,337	7,753	$46.141
Commercial & Industrial	$44,736	$671	17,409	13,057	$38.545
Total	$88,511	$1,328	28,543	21,407	$46.514

Notes:

(1) and (6) Eligible Spending Budget excludes Regulatory Costs, and Shareholder Incentive. See Table E-3 for details.

(2) Equal to the incentive rate (3.5%) x Column (1).

(3) and (8) See Table E-7

(4) and (9) 75% of Column (3). No incentive is earned on annual kWh savings in the sector unless the Company achieves at least this threshold level of performance.

(5) Column (2)*1000/Column (3). This illustration is for achieved savings equal to the savings target. The incentive earned per kWh will vary with the percent of the savings target achieved

(7) Equal to the incentive rate (1.5%) x Column (1).

(10) Column (7)*1000/Column (8). This illustration is for achieved savings equal to the savings target. The incentive earned per kW will vary with the percent of the savings target achieved

The shareholder incentive for Energy and Demand incentives will be calculated as follows, where SB is the Spending Budget in the sector:

- From 75% of savings to 100% of savings: Shareholder Incentive = SB x (0.15 x % of savings achieved – 0.10)
- x 0.7 for electric energy savings
- x 0.3 for electric demand savings
- x 1.0 for natural gas savings
- From 100% of savings to 125% of savings: Shareholder Incentive = SB x (0.05 x % of savings achieved)

Table E- 10
National Grid
Revolving Loan Fund Projections

Large C&I Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2016**	**$**	**17,979,678**
(2)	Current Loan Fund Balance	$	13,158,859
(3)	Projected Loans by Year End 2016	$	5,450,000
(4)	Projected Repayments by Year End 2016	$	1,400,000
(5)	**Projected Year End Loan Fund Balance 2016**	**$**	**9,108,859**
(6)	2017 Fund Injection	$	1,000,000
(7)	**Projected Loan Fund Balance, January 2017**	**$**	**10,108,859**
(8)	Projected Repayments throughout 2017	$	3,600,000
(9)	Estimated Loans in 2017	$	9,000,000
(10)	**Projected Year End Loan Fund Balance 2017**	**$**	**4,708,859**

Small Business Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2016**	**$**	**4,158,971**
(2)	Current Loan Fund Balance	$	1,759,554
(3)	Projected Loans by Year End 2016	$	1,300,000
(4)	Projected Repayments by Year End 2016	$	994,945
(5)	**Projected Year End Loan Fund Balance 2016**	**$**	**1,454,499**
(6)	2017 Fund Injection	$	300,000
(7)	**Projected Loan Fund Balance, January 2017**	**$**	**1,754,499**
(8)	Projected Repayments throughout 2017	$	2,000,000
(9)	Estimated Loans in 2017	$	3,000,000
(10)	**Projected Year End Loan Fund Balance 2017**	$	754,499

Public Sector Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2016**	**$**	**1,315,851**
(2)	Current Loan Fund Balance	$	831,308
(3)	Projected Loans by Year End	$	270,321
(4)	Projected Repayments by Year End	$	157,272
(5)	**Projected Year End Loan Fund Balance**	**$**	**718,260**
(6)	Fund Injection	$	(500,000)
(7)	**Projected Loan Fund Balance, January 2016**	**$**	**218,260**
(8)	Projected Repayments throughout 2017	$	312,340

Notes

The Public Sector Revolving Loan Fund was previously named Municipal Revolving Loan Fund. It began with $1.5 million from RGGI, $500k reallocated to RI PEP incentives in May 2015. The RGGI allocation plan allows for repurpose of funds in the future and OER has confirmed that $500k should be repurposed to RIIB in 2017, see
1 line (6).

2 Current Loan Fund Balance is through August 2016; it includes all loans made and reapayments made by August 2016.

3 Projected Loans by Year End 2016 is estimated based on current commitments

4 Projected Repayments by Year End 2016 is estimated based on the monthly average amount of repayments

5 Equal to (2) - (3) + (4)

7 Equal to (5) + (6)

8 Assumption based on monthly average repayments in 2016 over 12 month period; repayments accumulate over time and may vary widely.

Table E- 11
National Grid
Historic and Planned RGGI Proceeds

Auctions	Received	EE Funding	Initiative	Budget	2011 Spend	2012 Spend	2013 Spend	2014 Spend	2015 Spend	2016 Spend
1-5	March 2010	$ 3,950,152	Program Spending	$ 3,950,152	$ 3,950,152					
	December 2010	$ 2,633,434	Heat Loan	$ 449,463	$ 146,698	$ 302,765				
			Homes Tier III Pilot	$ 65,000	$ -	$ -				
			Deep Energy Retrofit Pilot	$ 260,000	$ 27,848	$ 297,152*				
			Small Bus. Revolving Loan Fund	$ 1,858,971	$ 1,843,371	$ 15,600				
6-10	January 2012	$ 4,034,678	Small Bus. Revolving Loan Fund	$ 2,300,000	n/a	$ 2,300,000				
			Large Bus. Revolving Loan Fund	$ 1,734,678	n/a	$ 1,734,678				
11-14	August 2013	$ 1,813,732	RI Public Energy Partnership	$ 1,515,851						
			Loan Fund	$1,015,851				$ 1,015,851		
			Incentives**	$ 417,340				$ -	$ -	$ 254,824
			Small Bus Community Bldgs	$ 372,288			$ 303,851		$ 68,437	
15-18	February 2014	$ 1,427,713	Residential Delivered Fuels	$ 800,000				$ 800,000		
			Agricultural Delivered Fuels	$ 194,300				$ 1,600	$ 38,854	$ 5,167
			Small Bus Community Bldgs	$ ***433,413				$ 363,931	$ 69,482	
19-22	January 2015	$ 3,635,495	Lower 2015 System Benefit Charge	$ 3,635,495					$ 3,635,495	
23-28	October 2015	$ 6,118,674	Lower 2016 System Benefit Charge	$ 3,588,674						$ 3,588,674
			RI Public Energy Partnership	$ 1,000,000						
			Electric Loan Fund	$800,000						$ 800,000
			Gas Loan Fund	$100,000						$ 100,000
			Incentives	$100,000						
			Residential Delivered Fuels	$ 1,500,000					$ 1,199,867	$ 300,133
			Agricultural Delivered Fuels	$ 100,000						
29-30	May 2016	$ 1,000,001	Residential Delivered Fuels	$ 1,000,001						$ 539,486
31-32	TBD	$ 2,009,452	Lower 2017 System Benefit Charge	$ 2,009,452						
Total				**$ 26,767,738**	**$ 5,968,069**	**$ 4,650,195**	**$ 303,851**	**$ 2,181,382**	**$ 5,012,135**	**$ 5,588,284**

2016 Spend is updated through June, 2016

*Deep Energy Retrofit Pilot includes funds from Homes Tier III Pilot as detailed in the 2012 RGGI Report to OER

**In May 2015, $82,660 was transferred from RI PEP incentives back to the RI Office of Energy Resources for the Block Island project.

**In June, $5,700 was transferred from Agricultural Delivered Fuels to Small Business Community Buildings to meet high customer demand.

ATTACHMENT 6

Table G-1
National Grid
Gas DSM Funding Sources in 2017 by Sector
$(000)

		Projections by Sector			
		Income Eligible Residential	Non-Income Eligible Residential	Commercial & Industrial	Total
(1)	**Projected Budget (from G-2):**	**$6,175.5**	**$13,183.5**	**$10,388.0**	**$29,747.1**
	Sources of Other Funding:				
(2)	Estimated Year-End 2016 Fund Balance and Interest:	($173.16)	($1,159.9)	($182.6)	($1,515.7)
(3)	Low Income Weatherization in Base Rates:	$200.00			$200.00
(4)	**Total Other Funding:**	**$26.8**	**($1,159.9)**	**($182.6)**	**($1,315.7)**
(5)	**Customer Funding Required:**	**$6,148.7**	**$14,343.4**	**$10,570.7**	**$31,062.8**
(6)	Forecasted Firm Dth Sales	1,666,249	17,859,201	19,935,126	39,460,576
(7)	Forecasted Non Firm Dth Sales			1,781,011	1,781,011
(8)	Less: Exempt DG Customers			(1,437,350)	(1,437,350)
(9)	**Forecasted Dth Sales:**	**1,666,249**	**17,859,201**	**20,278,787**	**39,804,237**
(10)	Average Energy Efficiency Program Charge per Dth excluding Uncollectible Recovery:				$0.780
(11)	Proposed Energy Efficiency Program Charge per Dth excluding Uncollectible Recovery	$0.860	$0.860	$0.703	
(12)	Currently Effective Uncollectible Rate	3.18%	3.18%	3.18%	
(13)	**Proposed Energy Efficiency Program Charge per Dth including Uncollectible Recovery:**	**$0.888**	**$0.888**	**$0.726**	
(14)	Currently Effective Energy Efficiency Program Charge per Dth	$0.748	$0.748	$0.487	
(15)	Adjustment to Reflect Fully Reconciling Funding Mechanism	$0.140	$0.140	$0.239	

Notes

(1) Projected Budget from G-2 includes OER and EERMC costs allocated to each sector based on forecasted sales, and RIIB costs allocated to C&I.

(2) Fund Balance projections include projected revenue and spend through year-end with Residential and C&I sector subsidies applied to Income Eligible as detailed in the 2016 EE Plan Table G-1.

(11) As agreed to by the settling parties, the proposed EE program charges allow for the use of collections from one sector to fund energy efficiency services in other sectors that would otherwise not be supported with the proposed collection rates. Specifically, the C&I charge includes a subsidy of $0.18 per Dth and the Residential charge includes a subsidy of $0.06 per Dth to fund the Income Eligible sector programs.

Table G-2
National Grid
2017 Gas Energy Efficiency Program Budget ($000)

	Program Planning and Administration	Marketing	Rebates and Other Customer Incentives	Sales, Technical Assistance and Training	Evaluation & Market Research	Shareholder Incentive	Grand Total
Non-Income Eligible Residential:							
ENERGY STAR® HVAC	$61.1	$118.8	$1,360.3	$258.3	$5.0	$0.0	$1,803.5
Energy*Wise*	$262.1	$81.8	$6,087.2	$456.1	$29.9	$0.0	$6,917.2
EnergyWise Multifamily	$83.7	$35.6	$1,312.3	$370.5	$21.4	$0.0	$1,823.6
Home Energy Reports	$30.3	$1.8	$436.8	$8.9	$19.2	$0.0	$497.0
Residential Demonstration and R&D	$1.2	$19.6	$75.0	$168.5	$0.1	$0.0	$264.4
Residential New Construction	$31.2	$4.4	$573.8	$172.0	$59.4	$0.0	$840.7
Comprehensive Marketing - Residential	$1.3	$68.1	$0.0	$0.3	$0.1	$0.0	$69.8
Community Based Initiatives - Residential	$0.5	$6.9	$14.5	$57.6	$0.0	$0.0	$79.6
Residential Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$614.8	$614.8
Subtotal - Non-Income Eligible Residential	**$471.3**	**$337.1**	**$9,859.9**	**$1,492.2**	**$135.2**	**$614.8**	**$12,910.5**
Income Eligible Residential:							
Single Family - Income Eligible Services	$155.2	$19.3	$2,655.0	$775.1	$36.0	$0.0	$3,640.6
Income Eligible Multifamily	$94.9	$12.8	$1,698.4	$395.4	$15.1	$0.0	$2,216.6
Income Eligible Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$292.9	$292.9
Subtotal - Income Eligible Residential	**$250.1**	**$32.1**	**$4,353.4**	**$1,170.5**	**$51.1**	**$292.9**	**$6,150.0**
Commercial & Industrial							
Large Commercial New Construction	$132.0	$179.0	$1,182.5	$556.7	$36.2	$0.0	$2,086.3
Large Commercial Retrofit	$245.9	$296.1	$3,852.7	$1,403.2	$32.6	$0.0	$5,830.5
Small Business Direct Install	$9.8	$23.7	$70.0	$134.3	$30.9	$0.0	$268.7
Commercial & Industrial Multifamily	$33.1	$17.1	$528.4	$152.2	$8.1	$0.0	$738.9
Commercial Demonstration and R&D	$5.4	$0.2	$25.0	$42.9	$0.2	$0.0	$73.8
Finance Costs	$0.0	$0.0	$500.0	$0.0	$0.0	$0.0	$500.0
RI Infrastructure Bank	$0.0	$0.0	$100.0	$0.0	$0.0	$0.0	$100.0
Community Based Initiatives - C&I	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Commercial & Industrial Shareholder Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$479.9	$479.9
Subtotal - Commercial & Industrial	**$426.1**	**$516.2**	**$6,258.5**	**$2,289.3**	**$108.0**	**$479.91**	**$10,078.0**
Regulatory							
EERMC	$304.3	$0.0	$0.0	$0.0	$0.0	$0.0	$304.3
OER	$304.3	$0.0	$0.0	$0.0	$0.0	$0.0	$304.3
Subtotal - Regulatory	**$608.5**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$608.5**
Grand Total	**$1,756.1**	**$885.4**	**$20,471.7**	**$4,952.1**	**$294.3**	**$1,387.5**	**$29,747.1**

Notes:

(1) OER and EERMC is equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 2%.

Table G-3
National Grid
Derivation of the 2017 Spending & Implementation Budgets ($000)

	Proposed 2017 Budget From G-2 ($000)	Outside Finance and Stakeholder Oversight Costs ($000)	Shareholder Incentive ($000)	Eligible Sector Spending Budget for Shareholder Incentive on G-9 ($000)[1]	Implementation Expenses for Cost-Effectiveness on G-5 ($000)[2]
Non-Income Eligible Residential					
ENERGY STAR® HVAC	$ 1,803.5		$ -		$ 1,803.5
Energy*Wise*	$ 6,917.2		$ -		$ 6,917.2
EnergyWise Multifamily	$ 1,823.6		$ -		$ 1,823.6
Home Energy Reports	$ 497.0		$ -		$ 497.0
Residential Demonstration and R&D	$ 264.4		$ -		$ 264.4
Residential New Construction	$ 840.7				$ 840.7
Comprehensive Marketing - Residential	$ 69.8		$ -		$ 69.8
Community Based Initiatives - Residential	$ 79.6		$ -		$ 79.6
Residential Shareholder Incentive	$ 614.8		$ 614.8		$ -
Subtotal - Non-Income Eligible Residential	**$ 12,910.5**	**$ -**	**$ 614.8**	**$ 12,295.7**	**$ 12,295.7**
Income Eligible Residential					
Single Family - Income Eligible Services	$ 3,640.6		$ -		$ 3,640.6
Income Eligible Multifamily	$ 2,216.6		$ -		$ 2,216.6
Income Eligible Shareholder Incentive	$ 292.9		$ 292.9		$ -
Subtotal - Income Eligible Residential	**$ 6,150.0**	**$ -**	**$ 292.9**	**$ 5,857.2**	**$ 5,857.2**
Commercial & Industrial					
Large Commercial New Construction	$ 2,086.3		$ -		$ 2,086.3
Large Commercial Retrofit	$ 5,830.5		$ -		$ 5,830.5
Small Business Direct Install	$ 268.7		$ -		$ 268.7
Commercial & Industrial Multifamily	$ 738.9		$ -		$ 738.9
Commercial Demonstration and R&D	$ 73.8		$ -		$ 73.8
Finance Costs	$ 500.0	$ 500.0	$ -		$ 500.0
RI Infrastructure Bank	$ 100.0	$ 100.0	$ -		$ 100.0
Community Based Initiatives - C&I	$ -		$ -		$ -
Commercial & Industrial Shareholder Incentive	$ 479.9		$ 479.9		$ -
Subtotal - Commercial & Industrial	**$ 10,078.0**	**$ 600.0**	**$ 479.9**	**$ 9,598.1**	**$ 9,598.1**
Regulatory					
EERMC	$ 304.3	$ 304.3			$ 304.3
OER	$ 304.3	$ 304.3			$ 304.3
Subtotal - Regulatory	**$ 608.5**	**$ 608.5**	$ -		**$ 608.5**
Grand Total	**$ 29,747.1**	**$ 1,208.5**	**$ 1,387.5**	**$ 27,751.0**	**$ 28,359.5**

Notes:
(1) Eligible Sector Spending Budget = Budget from G-2 minus Regulatory Costs and Shareholder Incentive
(2) Implementation Expenses = Budget from G-2 minus Shareholder Incentive

Table G-4
National Grid
Proposed 2017 Budget Compared to Approved 2016 Budget ($000)

	Proposed Budget 2017 from G-2	2016 Approved Gas Budget	Difference
Non-Income Eligible Residential			
ENERGY STAR® HVAC	$ 1,803.5	$ 1,619.2	$ 184.3
EnergyWise	$ 6,917.2	$ 6,929.5	$ (12.4)
EnergyWise Multifamily	$ 1,823.6	$ 1,978.6	$ (155.0)
Home Energy Reports	$ 497.0	$ 436.6	$ 60.3
Residential Demonstration and R&D	$ 264.4	$ 81.3	$ 183.0
Residential New Construction	$ 840.7	$ 836.9	$ 3.8
Comprehensive Marketing - Residential	$ 69.8	$ 69.8	$ 0.1
Community Based Initiatives - Residential	$ 79.6	$ 25.8	$ 53.8
Residential Shareholder Incentive	$ 614.8	$ 598.9	$ 15.9
Subtotal - Non-Income Eligible Residential	**$ 12,910.5**	**$ 12,576.6**	**$ 333.9**
Income Eligible Residential			
Single Family - Income Eligible Services	$ 3,640.6	$ 3,285.5	$ 355.1
Income Eligible Multifamily	$ 2,216.6	$ 2,063.3	$ 153.3
Income Eligible Shareholder Incentive	$ 292.9	$ 267.4	$ 25.4
Subtotal - Income Eligible Residential	**$ 6,150.0**	**$ 5,616.2**	**$ 533.8**
Commercial & Industrial			
Large Commercial New Construction	$ 2,086.3	$ 1,694.7	$ 391.6
Large Commercial Retrofit	$ 5,830.5	$ 4,871.1	$ 959.4
Small Business Direct Install	$ 268.7	$ 282.4	$ (13.7)
Commercial & Industrial Multifamily	$ 738.9	$ 754.7	$ (15.8)
Commercial Demonstration and R&D	$ 73.8	$ 97.3	$ (23.5)
Finance Costs	$ 500.0	$ 500.0	$ -
RI Infrastructure Bank	$ 100.0	$ 429.0	$ (329.0)
Community Based Initiatives - C&I	$ -	$ 6.4	$ (6.4)
Commercial & Industrial Shareholder Incentive	$ 479.9	$ 385.3	$ 94.6
Subtotal Commercial & Industrial	**$ 10,078.0**	**$ 9,020.9**	**$ 1,057.1**
Regulatory			
EERMC	$ 304.3	$ 233.3	$ 71.0
OER	$ 304.3	$ 233.3	$ 71.0
Subtotal Regulatory	**$ 608.5**	**$ 466.5**	**$ 142.0**
TOTAL BUDGET	**$ 29,747.1**	**$ 27,680.2**	**$ 2,066.8**

Table G-5
National Grid
Calculation of 2017 Program Year Cost-Effectiveness
All Dollar Values in ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Shareholder Incentive	TRC $/Lifetime MMBtu
Non-Income Eligible Residential						
Energy Star® HVAC	1.25	$ 6,428.2	$ 1,803.5	$ 3,331.6		$ 10.82
EnergyWise	1.27	$ 12,547.0	$ 6,917.2	$ 2,976.8		$ 14.63
EnergyWise MultiFamily	1.38	$ 3,422.1	$ 1,823.6	$ 662.8		$ 13.22
Home Energy Reports	1.08	$ 536.8	$ 497.0	$ -		$ 8.40
Residential New Construction	1.27	$ 2,062.6	$ 840.7	$ 789.0		$ 8.30
Comprehensive Marketing - Residential			$ 69.8			
Community Based Initiatives - Residential			$ 79.6			
Residential Demonstration and R&D			$ 264.4			
Non-Income Eligible Residential Subtotal	**1.21**	**$ 24,996.7**	**$ 12,295.7**	**$ 7,760.2**	**$ 614.8**	**$ 12.58**
Income Eligible Residential						
Single Family - Income Eligible Services	2.35	$ 8,561.9	$ 3,640.6	$ -		$ 16.50
Income Eligible Multifamily	2.42	$ 5,366.2	$ 2,216.6	$ -		$ 7.94
Income Eligible Residential Subtotal	**2.38**	**$ 13,928.1**	**$ 5,857.2**	**$ -**	**$ 292.9**	**$ 11.72**
Large Commercial & Industrial						
Large Commercial New Construction	2.50	$ 9,720.4	$ 2,086.3	$ 1,799.0		$ 3.93
Large Commercial Retrofit	2.17	$ 15,614.6	$ 5,830.5	$ 1,351.0		$ 4.07
Small Business Direct Install	1.52	$ 442.5	$ 268.7	$ 23.1		$ 7.74
Commercial & Industrial Multifamily	2.33	$ 1,856.1	$ 738.9	$ 58.7		$ 12.82
Commercial Demonstration and R&D			$ 73.8			
Community Based Initiatives - C&I			$ -			
Finance Costs			$ 500.0			
RI Infrastructure Bank			$ 100.0			
Commercial & Industrial Subtotal	**2.08**	**$ 27,633.6**	**$ 9,598.1**	**$ 3,231.8**	**$ 479.9**	**$ 4.50**
Regulatory						
EERMC			$ 304.3			
OER			$ 304.3			
Regulatory Subtotal			**$ 608.5**			
Grand Total	**1.63**	**$ 66,558.4**	**$ 28,359.5**	**$ 10,992.0**	**$ 1,387.5**	**$ 7.96**

Table G-6
National Grid
Summary of 2017 Benefits and Savings by Program

	Benefits ($000)			MMBTU Gas Saved	
	Total(1)	Natural Gas(2)	Non-Gas Benefit (3)	Annual	Lifetime(4)
Non-Income Eligible Residential					
Energy*Wise*	$12,547.0	$7,465.7	$5,081.4	28,587	676,502
Energy Star® HVAC	$6,428.2	$4,878.0	$1,550.2	27,393	474,685
EnergyWise Multifamily	$3,422.1	$2,052.1	$1,370.0	11,518	188,087
Home Energy Reports	$536.8	$536.8	$0.0	59,164	59,164
Residential New Construction	$2,062.6	$2,062.6	$0.0	11,575	196,268
Non-Income Eligible Residential SUBTOTAL	**$24,996.7**	**$16,995.1**	**$8,001.6**	**138,237**	**1,594,705**
Income Eligible Residential					
Single Family - Income Eligible Services	$8,561.9	$2,345.4	$6,216.5	11,032	220,640
Income Eligible Multifamily	$5,366.2	$3,128.3	$2,237.9	15,810	279,130
Income Eligible Residential SUBTOTAL	**$13,928.1**	**$5,473.7**	**$8,454.4**	**26,842**	**499,770**
Commercial & Industrial					
Large Commercial New Construction	$9,720.4	$9,718.0	$2.4	53,516	988,409
Large Commercial Retrofit	$15,614.6	$15,614.6	$0.0	187,938	1,762,771
Small Business Direct Install	$442.5	$442.5	$0.0	3,639	37,711
Commercial & Industrial Multifamily	$1,856.1	$618.9	$1,237.2	4,434	62,198
Commercial & Industrial SUBTOTAL	**$27,633.6**	**$26,394.0**	**$1,239.6**	**249,527**	**2,851,089**
TOTAL	**$66,558.4**	**$48,862.9**	**$17,695.5**	**414,606**	**4,945,564**

Table G-7
National Grid
Comparison of 2016 and 2017 Goals

	Proposed 2017		Approved 2016	Difference
	Annual Energy Savings (MMBTU Natural Gas)	**Planned Unique Participants**	**Annual Energy Savings (MMBTU Natural Gas)**	**Annual Energy Savings (MMBTU Natural Gas)**
Non-Income Eligible Residential				
Energy*Wise*	28,587	2,250	68,117	-39,530
Energy Star® HVAC	27,393	2,104	26,064	1,329
EnergyWise Multifamily	11,518	4,101	17,208	-5,689
Home Energy Reports	59,164	99,001	53,989	5,175
Residential New Construction	11,575	373	10,907	668
Non-Income Eligible Residential SUBTOTAL	**138,237**	**107,829**	**176,284**	**-38,047**
Income Eligible Residential				
Single Family - Income Eligible Services	11,032	590	9,368	1,664
Income Eligible Multifamily	15,810	2,709	19,915	-4,105
Income Eligible Residential SUBTOTAL	**26,842**	**3,299**	**29,283**	**-2,441**
Commercial & Industrial				
Large Commercial New Construction	53,516	149	43,424	10,092
Large Commercial Retrofit	187,938	147	133,613	54,325
Small Business Direct Install	3,639	86	3,667	-28
Commercial & Industrial Multifamily	4,434	806	9,490	-5,056
Commercial & Industrial SUBTOTAL	**249,527**	**1,188**	**190,194**	**59,333**
TOTAL	**414,606**	**112,316**	**395,760**	**18,846**

Notes:

(1) Participants can participate in more than one program, for example Home Energy Reports and EnergyWise.

(2) Planned 2017 participation takes into account net-to-gross and estimates unique participation by taking into account 2015 unique customer accounts to savings ratios. Therefore the number of planned measures may be more than the planned participants. For measure counts please view the widgets tables at the end of the Residential and C&I text sections. Table G-7 no longer includes a comparison to the previous year's participation. Due to the way unique participation is calculated it is not possible to compare year-over-year results.

(3) Beginning in 2017, Home Energy Reports participation will be counted as the number of customers receiving reports (i.e., the “treatment group”) adjusted by the “Read Rate” of 75% from the most recent Customer Engagement Tracker Survey.

Table G-8
National Grid
Avoided Costs Used in 2017 Benefit-Cost Model

	RESIDENTIAL				COMMERCIAL & INDUSTRIAL			ALL
Year	Non Heating	Hot Water	Heating	All	Non Heating	Heating	All	RETAIL END USES
2017	5.98	7.38	7.85	7.64	6.21	7.17	6.82	7.24
2018	6.45	7.84	8.30	8.08	6.68	7.62	7.28	7.69
2019	6.50	7.77	8.19	8.01	6.69	7.56	7.25	7.64
2020	6.14	7.39	7.81	7.63	6.33	7.17	6.87	7.26
2021	6.45	7.71	8.13	7.94	6.63	7.49	7.18	7.57
2022	6.53	7.78	8.20	8.02	6.71	7.56	7.26	7.65
2023	6.62	7.87	8.28	8.10	6.80	7.65	7.35	7.73
2024	6.81	8.07	8.49	8.31	6.99	7.85	7.54	7.93
2025	6.92	8.17	8.59	8.41	7.11	7.96	7.66	8.04
2026	7.03	8.28	8.70	8.52	7.21	8.07	7.76	8.15
2027	7.11	8.36	8.78	8.60	7.29	8.15	7.84	8.23
2028	7.22	8.47	8.89	8.72	7.41	8.25	7.95	8.35
2029	7.41	8.67	9.08	8.91	7.60	8.45	8.15	8.54
2030	7.69	8.94	9.36	9.19	7.88	8.73	8.43	8.82
2031	7.83	9.08	9.49	9.32	8.02	8.86	8.56	8.95
2032	7.97	9.21	9.63	9.46	8.15	9.00	8.70	9.09
2033	8.11	9.35	9.77	9.60	8.30	9.13	8.84	9.23
2034	8.26	9.49	9.91	9.74	8.44	9.28	8.98	9.37
2035	8.40	9.63	10.05	9.88	8.59	9.42	9.13	9.52
2036	8.55	9.78	10.19	10.03	8.74	9.56	9.27	9.66
2037	8.71	9.93	10.33	10.17	8.89	9.71	9.42	9.81
2038	8.86	10.08	10.48	10.32	9.04	9.86	9.58	9.96
2039	9.02	10.23	10.63	10.47	9.20	10.01	9.73	10.11
2040	9.18	10.38	10.78	10.63	9.36	10.16	9.89	10.27
2041	9.34	10.54	10.94	10.78	9.52	10.32	10.05	10.43
2042	9.51	10.69	11.09	10.94	9.69	10.48	10.21	10.59
2043	9.68	10.85	11.25	11.10	9.85	10.64	10.37	10.75
2044	9.85	11.02	11.41	11.27	10.02	10.80	10.54	10.91
2045	10.03	11.18	11.57	11.43	10.20	10.97	10.71	11.08

From 2015 Avoided Cost Study
Appendix C for Southern New England

Table G-9
National Grid
2017 Targeted Shareholder Incentive

Incentive Rate: 5.00%

Sector	(1) Eligible Spending Budget $(000)	(2) Target Incentive $(000)	(3) Target Savings Goal (MMBTU)	(4) Threshold Savings (MMBTU)	(5) Target Incentive Per Annual MMBTU
Income Eligible Residential	$5,857	$292.9	26,842	20,131	$10.911
Non-Income Eligible Residential	$12,296	$614.8	138,237	103,678	$4.447
Commercial & Industrial	$9,598	$479.9	249,527	187,145	$1.923
Total	$27,751	$1,387.5	414,606	310,955	$3.347

Notes:

(1) Eligible Spending Budget excludes EERMC, OER, and Shareholder Incentive. See Table G-3 for details.

(2) Equal to the incentive rate (5.0%) x Column (1).

(3) See Table G-7

(4) 75% of Column (3). No incentive is earned on annual MMBTU savings in the sector unless the Company achieves at least this threshold level of performance.

(5) Column (2)*1000/Column (3). This illustration is for achieved savings equal to the savings target. The incentive earned per MMBtu will vary with the percent of the savings target achieved

The shareholder incentive will be calculated as follow, where SB is the Spending Budget in the sector:

- From 75% of savings to 100% of savings: Shareholder Incentive = SB x (0.15 x % of savings achieved – 0.10)
- From 100% of savings to 125% of savings: Shareholder Incentive = SB x (0.05 x % of savings achieved)

Table G- 10
National Grid
Revolving Loan Fund Projections

Large C&I Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2016**	**$**	**1,780,000**
(2)	Current Loan Fund Balance	$	1,196,857
(3)	Projected Loans by Year End 2016	$	910,646
(4)	Projected Repayments by Year End 2016	$	92,962
(5)	**Projected Year End Loan Fund Balance 2016**	**$**	**379,172**
(6)	2017 Fund Injection	$	500,000
(7)	**Projected Loan Fund Balance, January 2017**	**$**	**879,172**
(8)	Projected Repayments throughout 2017	$	735,019
(9)	Estimated Loans in 2017	$	1,200,000
(10)	**Projected Year End Loand Fund Balance 2017**	**$**	**414,191**

Notes

2 Current Loan Fund Balance is through August 2016

3 Projected Loans by Year End 2016 is estimated based on current commitments

4 Projected Repayments by Year End 2016 is estimated based on projected loans by year end and repayment schedules

5 Equal to (2) - (3) + (4)

6 Fund Injection, as budgeted on E-2

7 Equal to (5) + (6)

8 Assumption based on average repayments over 12 months; repayments accumulate over time and may vary widely.

ATTACHMENT 7

2017 Energy Efficiency Program Plan Bill Impacts

Summary

National Grid performed an analysis of the electric and gas bill impacts resulting from the proposed 2017 Energy Efficiency Program Plan. Bill impacts are distinct from rate impacts because they model the long-term effects of efficiency programs on customer bills by aggregating rate and consumption changes. In the electric bill impact analysis, rate impacts are modeled by mapping energy efficiency (EE) programs to rate classes and estimating changes in both delivery service rates and supply costs due to the EE program charge proposed in the Plan. Consumption impacts are predicted from proposed participation and energy efficiency savings. Where possible, other effects of energy efficiency beyond direct energy savings – such as price suppression and avoided infrastructure investments – are also included. In the gas bill impact analysis, rate impacts for different sectors account for the EE charge, while consumption impacts are modeled based on predicted participation and energy savings in the 2017 plan.

The key finding of the bill impact analyses is that, over the lifetimes of the programs proposed for 2017; the average Rhode Island customer's (participants and non-participants combined) bill will be less than if there were no programs. Overall, rates may increase, but participation in EE programs balances out the costs of the EE program charge and revenue recovery.

Electric Bill Impacts

The electric bill impact models used to generate the electric results were adapted from models originally built by Synapse Energy Economics on behalf of the Division of Public Utilities and Carriers in 2013. These models are distinct from the traditional electric bill impacts models the Company presents in Rates proceedings before the PUC. The new models analyze two cases: the fulfillment of the 2017 Plan and the absence of an efficiency plan in 2017. This comparison isolates the effects of the proposed 2017 EE program charge and Fully Reconciling Funding Mechanism. It assumes EE plans have not been implemented before 2017 nor will be offered after 2017. The analysis also incorporates how system-wide reduction in energy consumption affects the different elements of rates such as transmission, distribution, and commodity charges.

Four separate electric models were developed, one for each of the main customer segments: Residential, Income Eligible, Small Commercial, and Large Commercial and Industrial. For all of the electric models, the key inputs are the net planned participation and savings numbers from Table E-7 in Attachment 5. The models combine these data with rate class information to determine the benefits to customer bills from program participation. Table 1 below shows the mapping of efficiency programs to rate classes for

the four models.[1] The diversity of the commercial customer profile means that customers from multiple rate classes can participate in any commercial program. Assumptions on these rate-class blends were made based on historical program participation data.

Table 1: Electric Rate and Program Mapping

Bill Impact Model	Rate Class(es)	Efficiency Programs
Residential Electric	A-16	Home Energy Reports
		ENERGY STAR® HVAC
		EnergyWise
		EnergyWise Multifamily
		ENERGY STAR® Lighting
		Residential Consumer Products
Income Eligible Electric	A-60	Income Eligible Single Family
		Income Eligible Multifamily
		Home Energy Reports
		ENERGY STAR® Lighting
Small Commercial Electric	C-06 and G-02	Small Business Direct Install
Large Commercial Electric	G-02 and G-32	Large Commercial New Construction
		Large Commercial Retrofit

The results of the models are shown in Tables 2 through 5, and some highlights of the results are presented after the Tables. The columns in the Tables are as follows:

- Long-term rate impacts are defined as the average rate increase percentage from 2017 to 2037 (positive numbers indicate rate increase).
- Typical energy savings refer to the average percentage of energy savings to total annual consumption from 2017 to 2037 (positive numbers indicate electricity consumption reduction).
- Typical bill savings are defined as average percentage of bill decrease to total customer bill from 2017 to 2037 (positive numbers indicate electricity bill reduction).

The long-term rate impacts, typical energy savings, and typical bill savings are shown for average participants in energy efficiency programs, non-participants, and average customers within each of the four main customer segments.

On the residential side, rates and non-participant bills increase slightly, mostly from lost revenue recovery, while participant and average customer bills go down. The decreased average customer bills demonstrate that the scale and savings of program participation outweighs non-participant costs. On

[1] Delivery service rate docket used in the analysis are R.I.P.U.C No. 2100 for basic residential rate, R.I.P.U.C No. 2101 for low-income residential rate, R.I.P.U.C No. 2104 for small C&I rate, R.I.P.U.C No. 2147 for large C&I rate. Standard Offer Service rates used in the analysis are R.I.P.U.C. No. 2096 A-06 & A-16 total commodity charge for standard and low income residential rate group, C-06 total commodity charge for small C&I rate group, and G-32 total commodity charge for large C&I rate group.

the commercial side, long-term rates increase slightly for small C&I customers and stay roughly constant for large C&I customers, while bills decrease for participants and average customers in both rate groups.

Table 2: 2017 Residential Bill Impact Analysis (2017 EE vs. No EE)

Residential	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Average Participant	1.26%	3.21%	2.00%
Non-Participant	1.26%	0.00%	-1.26%
Average Customer	1.26%	2.91%	1.69%

Table 3: 2017 Income Eligible Bill Impact Analysis (2017 EE Plan vs. No EE)[2]

Income-Eligible	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Average Participant	1.45%	5.23%	3.86%
Non-Participant	1.45%	0.00%	-1.45%
Average Customer	1.45%	4.53%	3.16%

Table 4: Small Commercial Bill Impact Analysis (2017 EE Plan vs. No EE)

	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Small C&I Participant	0.41%	35.74%	35.47%
Non-Participant	0.41%	0.00%	-0.41%
Average Customer	0.41%	0.62%	0.16%

Table 5: Large Commercial & Industrial Bill Impact Analysis (2017 EE Plan vs. No EE)

Commercial & Industrial	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Participant	0.10%	4.72%	4.63%
Non-Participant	0.10%	0.00%	-0.10%
Average Customer	0.10%	3.54%	3.44%

Explanation of Electric Bill Impact Results

- Residential long-term rate impacts: EE programs bring system benefits in terms of avoided infrastructure investment in generation, transmission, and distribution in the long-run. These avoided investments will ultimately flow through rates and offset the short-term contribution of

[2] Home Energy Reports and Energy Star Lighting participation and savings are split between standard residential and income-eligible customers, since these measures reach all residential customers. For analysis purposes, it is assumed that income-eligible customers account for 10% of participation and 10% of savings in the two programs.

the EE program charge to 2017 rates (about 7%) and bring the long-term rate increase down to 1.26% for standard residential customers and 1.45% for income-eligible residential customers.

- Small and Large C&I long-term rate impact: avoided infrastructure costs flow through rates and partially offset the EE program charge for 2017 and beyond, leading to only 0.41% increase in rates for small C&I customers and roughly constant large C&I rates in the long-run.

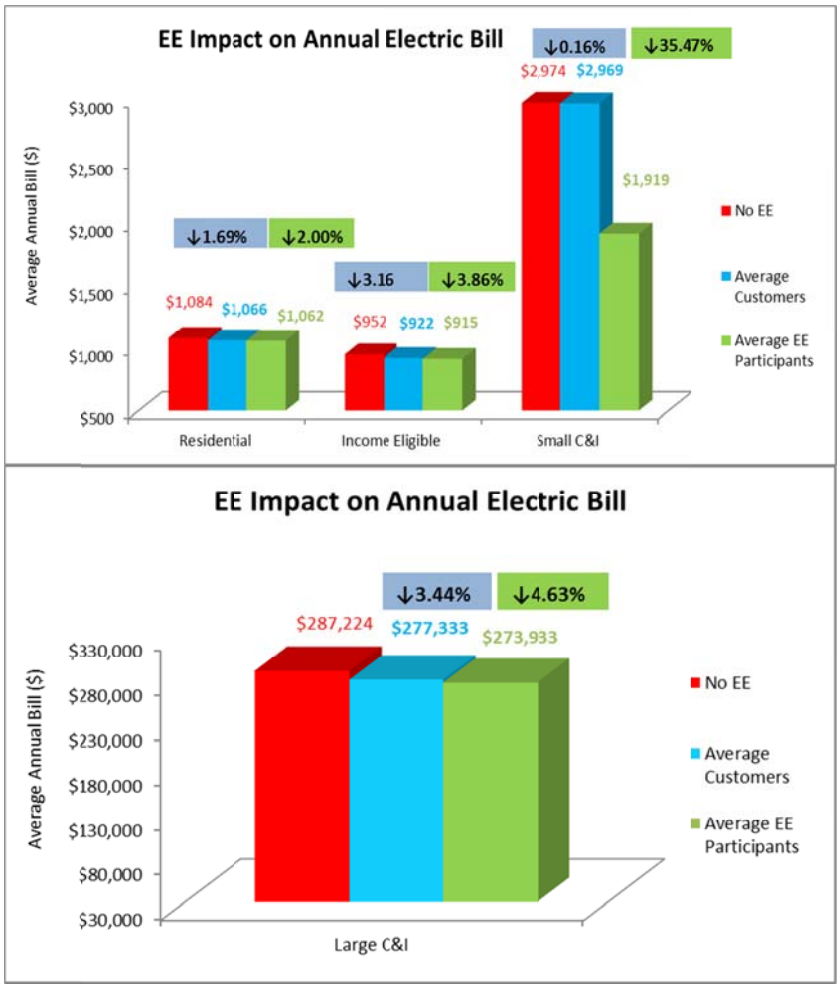
- Average participant bill savings: the proposed EE programs will bring bill savings to participants in all rate groups. Specifically, typical bill savings are 2.00% for standard residential participants, 3.86% for income-eligible residential participants, 35.47% for small C&I participants, and 4.63% for large C&I participants (Table 2-5).

- The bill savings for small C&I average participants increased compared to 2016, even though the planned energy savings stayed relatively consistent. This is because the customer group split between small C&I and large C&I customers was revised. The small C&I customer count in this analysis is higher than 2016, which reduces the consumption per customer and increases the size of the bill impact on each participant. The high average participant bill savings and low average customer bill savings indicate that the program participation is low, thus each participant sees significant benefit but average customer bill savings is then diluted by the slight increase in non-participants bills.

- Average customer typical bill savings: among all participants and non-participants, typical bill savings is 1.69% for standard residential customers, 3.16% for income-eligible residential customers, 0.16% for small C&I customers, and 3.44% for large C&I customers, indicating that the proposed EE programs will bring net benefits to all types of electric customers in Rhode Island (Table 2-5).

Figure 1 shows an example of electric bill reduction for average residential, income eligible, small C&I, and large C&I customers and participants. Bills are calculated based on average annual consumption of a typical customer in Rhode Island (residential and low-income: 6000 kWh; small C&I in C-06 rate group: 18000 kWh, large C&I in G32 rate group: 2.4 million kWh). Rates used in this example are same as rates used in the bill impact analysis. This bill example is different from traditional incremental bill impact because it shows the long-term bill impact of the proposed EE programs.

Figure 1: Example of Typical Participant and Customer Annual Electric Bill Impact (2017 EE Plan v. No EE)



Gas Bill Impacts

The natural gas bill impacts were analyzed by adapting an existing gas bill impact model used by the Company in dockets 4634 and 4647.[3] The updated model analyzes the effects of the 2017 Plan by looking at a change in average consumption due to energy efficiency. The adapted gas models do not account for efficiency's effects on future gas rates. They only look at direct energy savings for the rate classes that best map to the four efficiency customer segments: Residential, Income Eligible, Small Business, and Large Commercial and Industrial. The table below shows the mapping of rates to customer segments.[4]

[3] Proposed DAC rates are in Docket 4634 and proposed GCR rate are in Docket 4647.

[4] The analysis uses residential and income eligible heating to represent the two groups. As of August 2016, residential heating represents 91% of standard residential customers and income eligible heating represents 99% of income eligible customers.

Table 6: Gas Rate Mapping

Bill Impact Model	Rate Class(es)
Residential Gas	Residential Heating
Income Eligible Gas	Residential Heating – Low Income
Small Commercial Gas	C&I Small
Large Commercial Gas	C&I Medium, Large Low Load, Large High Load, Extra Large Low Load, Extra Large High Load

The proposed EE programs lead to reduction in participant bills. Moreover, the annual bills for average customer (participants and non-participants combined) are also projected to decrease for all four rate groups (residential heating, low-income heating, small commercial and large commercial). The detailed bill reduction percentages are shown in Table 7. The columns in the Tables are as follows:

- The rate impact is calculated as percent increase in rates due to EE (positive numbers indicate rate increase).
- The participant bill savings is defined as percent change in participant bill over the lifetime of the EE programs (positive numbers indicate participant bill decrease).
- The average customer bill savings is expressed as the percent change in total bill for average customers (participants and non-participants combined and positive numbers indicate average customer bill decrease).

Table 7: RI Gas Bill Impact Analysis

Rate Group	Rate Impact (% of 2017 Total Rate)	Average Participant Bill Savings (% Change in 2017 Bill)	Average Customer Bill Savings (% Change in 2017 Bill)
Residential Heating	6.23%	0.85%	0.60%
Low Income Heating	6.23%	8.47%	1.49%
Small Commercial	5.19%	3.53%	0.02%
Large Commercial	5.27%	4.38%	0.85%

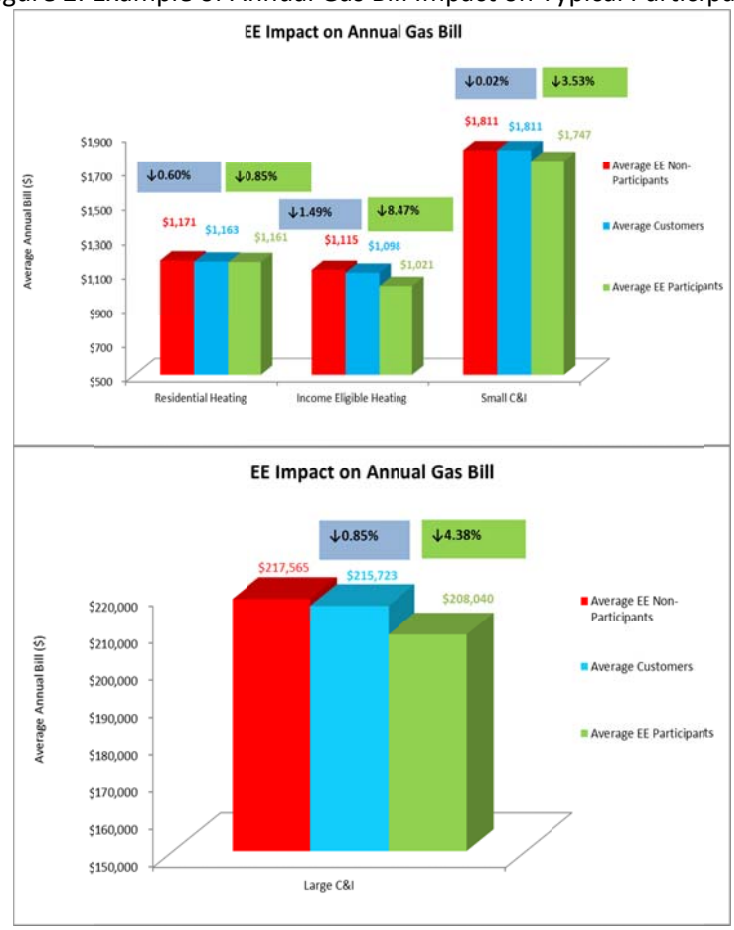
Explanation of Gas Bill Impact Results:

- The total EE contribution to the 2017 gas rate is 6.23% for residential rates and, 5.19% for small C&I rates, and 5.27% for large C&I rates.

- Typical bill savings is 0.85% for standard residential participants, 8.47% for income-eligible residential participants, 3.53% for small C&I participants, and 4.38% for large C&I participants (Table 7). [5]
- The average customers in all rate groups will experience bill decrease (0.60% for standard residential customers, 1.49% for income-eligible residential customers, 0.02% for small C&I customers, and 0.85% for large C&I customers), indicating that the proposed EE programs will bring net benefits to all types of gas customers in Rhode Island (Table 7).

Figure 2 shows an example of gas bill reduction for average residential heating, income-eligible heating, small C&I, and large C&I customers and participants. Bills are calculated based on average annual consumption of a typical customer in Rhode Island (standard residential: 846 Therms, low-income residential: 846 Therms, small C&I: 1,352 Therms, large C&I: 269,689 Therms).

Figure 2. Example of Annual Gas Bill Impact on Typical Participant and Customer



[5] The difference in bill reduction percentage between standard residential and income-eligible participants is mainly driven by Home Energy Reports for standard residential customers. Home Energy Report brings less direct energy savings to participants. This analysis assumes Home Energy Reports are offered to standard residential customers.