STATE OF RHODE ISLAND
PUBLIC UTILITIES COMMISSION

In Re: The Narragansett Electric Company d/b/a National Grid	**Docket No. 5076**

2021-2023 Energy Efficiency Program Plan & 2021 Annual Energy Efficiency Program Plan

October 15, 2020

Filing Letter

Andrew Marcaccio
Senior Counsel

October 15, 2020

BY HAND DELIVERY AND ELECTRONIC MAIL

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

RE: Docket No. 5076 – The Narragansett Electric Company d/b/a National Grid 2021-2023 Energy Efficiency Program Plan & 2021 Annual Energy Efficiency Program Plan

Dear Ms. Massaro:

On behalf of The Narragansett Electric Company d/b/a National Grid ("National Grid" or the "Company"), enclosed[1], please find the Company's 2021-2023 Energy Efficiency and Conservation Procurement Plan ("Three-Year Plan") and 2021 Annual Energy Efficiency and Conservation Procurement Program Plan ("Annual Plan") (the Three-Year Plan and Annual Plan are referred to collectively as the "Combined Plan").[2] The Combined Plan is being filed with the Public Utilities Commission ("Commission") in accordance with R.I. Gen. Laws § 39-1-27.7(c) and the Least Cost Procurement Standards as approved and adopted pursuant to Order No. 23890 in Docket No. 5015 (the "LCP Standards").

The Combined Plan is a settlement between National Grid, the Office of Energy Resources ("OER"), the Division of Public Utilities and Carriers, ("Division"), the Energy Efficiency and Resource Management Council ("EERMC"), Acadia Center, and the Green Energy Consumers Alliance (collectively, the "Settlement Parties"). The Company respectfully requests approval by the Commission of the Combined Plan as specified in Section 13 of the Three-Year Plan and Section 17 of the Annual Plan.

In support of the Combined Plan, the Company has included joint pre-filed direct testimony of Christopher Porter, Matthew Ray, and John Tortorella. Please note that the joint pre-filed direct testimony is being submitted on behalf of the Company and not on behalf of the other Settlement Parties as they have not had an opportunity to review the testimony prior to this filing.

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[1] Per Commission counsel's update on October 2, 2020, concerning the COVID-19 emergency period, the Company is submitting an electronic version of this filing followed by an original and five hard copies filed with the Clerk within 24 hours of the electronic filing.

[2] The Company exercised the option available through section 3.3 (B)(v) of the LCP Standards, which allows for a combined filing of the Annual Plan (first year) with the Three-Year Plan.

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In addition to the joint pre-filed direct testimony, the Company is providing the Commission with the benefit cost models in electronic form[3] which were used in the development of the Annual and Three-Year Plans. Specifically, the models contain measure level information such as planned quantities, costs, energy saving impacts, quantifiable customer benefits, and demonstrate the portfolio's cost effectiveness. Under separate cover,[4] the Company will be filing a Technical Reference Manual for Estimating Savings from Energy Efficiency Measures ("TRM") for the 2021 Program Year. The TRM documents the methodologies and assumptions used by Company to estimate the savings, including reductions in energy and demand consumption and other resource and non-energy impacts, attributable to its electric and gas energy efficiency programs.

The Three-Year Plan outlines the Company's overall programmatic focus and strategies, including illustrative and provisional budgets, system benefits charges, and savings goals for the three years of implementation. It lays out a vision for National Grid's continued transformation of the energy efficiency sector in Rhode Island, including key themes and areas of focus for 2021-2023 that will then be further developed in each subsequent annual plan. The Three-Year Plan also defines the structure of a new performance incentive mechanism ("PIM") for the energy efficiency portfolios.

If approved as filed, the Annual Plan is expected to create over $751 million in benefits over the life of the installed electric, active demand response, and natural gas energy efficiency measures. Specifically, the electric-funded portion of the Annual Plan is anticipated to create electric energy savings of 1,306,562 net lifetime MWhs, 139,478 net annual MWhs, and 22,723 net annual kW from passive energy efficiency. The Annual Plan is anticipated to generate electric energy savings of 39,339 net annual kW from active demand reduction measures. The natural gas-funded portion of the Annual Plan is anticipated to create energy savings of 4,206,444 net lifetime MMBtus and 425,359 net annual MMBtus. In addition, the Company anticipates that investments made in energy efficiency to achieve these energy savings will add $341.8 million to Rhode Island's state gross domestic product ("GDP").

The Annual Plan proposes total budgets of $122.3 million and $38.6 million for electric and gas, respectively. Given the current economic climate and the uncertainty caused by the COVID-19 pandemic, the Annual Plan proposes a fully reconciling funding mechanism that would hold flat current energy efficiency surcharges for all electric and gas customers. Please see Section 11 of the Annual Plan for additional details.

As the Company has done in prior years, it will update the surcharges by submitting revised Tables E-1 and G-1 on or around December 1, 2020.

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[3] The Company is sending two Excel files to the Commission Clerk via Egress Switch
[4] On or by October 22, 2020.

Thank you for your attention to this filing. If you have any questions, please contact me at 401-784-4263.

Sincerely,

Andrew S. Marcaccio

cc: John Bell, Division
Jon Hagopian, Esq.

Joint Testimony

JOINT PRE-FILED DIRECT TESTIMONY

OF

CHRISTOPHER PORTER, MATTHEW RAY

AND

JOHN TORTORELLA

October 15, 2020

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SCHEDULES

SCHEDULE A: National Grid 2021-2023 Energy Efficiency Plan

SCHEDULE B: Annual Energy Efficiency Plan for 2021 and Attachments

I. INTRODUCTION

Christopher Porter

Q. Mr. Porter, please state your name and business address.

A. My name is Christopher Porter. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what position?

A. I am employed by National Grid USA Service Company, Inc. (Service Company), a subsidiary of National Grid USA as Director, Customer Energy Management, New England. In this role, I lead the teams responsible for the Company's energy efficiency strategy, policy, and planning in Rhode Island and Massachusetts.

Q. Please describe your education and your professional experience.

A. I received a Bachelor of Arts with Honors in Political Science from Brown University in 1997 and a Masters in Business Administration from the Sloan School at the Massachusetts Institute of Technology in 2005. I have worked in various consulting capacities in the energy and utility industries since 2004, including covering the North American natural gas industry for Cambridge Energy Research Associates (now IHS) and serving in the Energy & Environment practice at Charles River Associates (CRA International). Prior to joining National Grid, I was Director of Utility Services at

EnerNOC, where I was responsible for overseeing delivery, implementation, and customer success for EnerNOC's bilateral utility demand response programs, utility customer engagement software, and strategic energy management businesses. I joined National Grid in November of 2017 and have been in my current role since August of 2018.

Q. Have you previously testified before the Rhode Island Public Utilities Commission (PUC)?

A. I testified before the PUC in the Company's 2020 Energy Efficiency Program Plan proceeding in Docket No. 4979. I have also appeared before the PUC in Technical Sessions in Docket Nos. 5015 and 5023. I have also testified before the Massachusetts Department of Public Utilities in docket MA DPU 17-140, Joint Petition of Electric Distribution Companies for Approval of Model Solar Massachusetts Renewable Target Tariff pursuant to An Act Relative to Solar Energy.

<u>Matthew Ray</u>

Q. Mr. Ray, please state your name and business address.

A. My name is Matthew Ray. My business address is 280 Melrose Street, Providence, Rhode Island 02907.

Q. By whom are you employed and in what position?

A. I am employed by National Grid USA Service Company, Inc as Manager, Rhode Island Customer Energy Management. In this role, I manage the team that develops the Annual and Three-Year Energy Efficiency Plans.

Q. Please describe your education and your professional experience.

A. I received a Bachelor of Arts in Criminal Justice from the University of Nevada-Las Vegas in 2009 and a Juris Doctor from Roger Williams University School of Law in 2012. In former roles at the Company, I led stakeholder engagement through the Energy Efficiency Technical Working Group (EE TWG), oversaw strategic decisions for Income Eligible Multifamily, Market Rate Multifamily, and Behavioral energy efficiency programs and the Company's Community-Based Initiative in Rhode Island. Prior to joining the Company in 2015, I worked for a non-profit that created clean energy community engagement programs for states, municipalities and utilities.

Q. Have you previously testified before the PUC?

A. Yes. Since 2015, I have testified before the PUC on multiple occasions related to energy efficiency dockets, including in the 2020 Energy Efficiency Program Plan, Docket No. 4979.

John Tortorella

Q. Mr. Tortorella, please state your name and business address.

A. My name is John Tortorella. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what position?

A. I am employed by National Grid USA Service Company, Inc. (Service Company), a subsidiary of National Grid USA as Senior Analyst, Customer Energy Management, Rhode Island. In this role, I am a member of the team responsible for the Company's energy efficiency strategy, policy, and planning in Rhode Island. I contribute to many aspects of the development of the Company's Annual and Three-Year Energy Efficiency Plans and lead stakeholder engagement through the EE TWG.

Q. Please describe your education and your professional experience.

A. I received a Bachelor of Science in Resource Economics from the University of Connecticut in 2009 and a Master of Environmental Management from the Nicholas School of the Environment at Duke University in 2011. Prior to joining National Grid, I most recently worked for Opinion Dynamics where I was involved in a variety of evaluation and market research engagements related to energy efficiency. I have also

previously held consulting roles with ICF International supporting primarily federal and state clients. I joined National Grid in June of 2019 and have been in my current role since that time.

Q. Have you previously testified before the PUC?

A. Yes. I testified before the PUC in the Company's 2020 Energy Efficiency Program Plan proceeding in Docket No. 4979. I have also appeared before the PUC in Technical Sessions in Docket Nos. 5015 and 5023.

II. BACKGROUND

Q. What is the purpose of this joint testimony?

A. The purpose of our joint testimony is to highlight certain key aspects of the 2021-2023 Three Year Energy Efficiency and Conservation Procurement Plan (the Three-Year Plan) and of the 2021 Annual Energy Efficiency and Conservation Procurement Plan (the Annual Plan, collectively the Plans). The purpose of this testimony is also to demonstrate that the Plans meet the applicable statutory and regulatory requirements and to request PUC approval of the proposed measures, programs, and portfolios which are discussed in greater detail herein and within the Plans.

Q. What did the Company review when structuring and preparing this year's pre-filed testimony?

A. When structuring and preparing this testimony, the Company referred to the PUC's directive in the latest revision to the Least Cost Procurement (LCP) Standards in PUC Docket No. 5015, Sections 3.3(B)(iv) and 3.4(B)(xii), which outlines the topics that should be addressed in the pre-filed testimony.

Q. How did the Company prepare the Plans?

A. The Plans were prepared by National Grid in collaboration with key stakeholders throughout the planning process spanning from March to October of 2020. The plans were also informed by the Targets setting process in Docket No. 5023 and the updated LCP Standards in Docket No. 5015. The plans are the result of a process of extensive stakeholder input and engagement including the Energy Efficiency Technical Working Group (EE TWG[1]) which led to the unanimous endorsement of both plans by the Energy Efficiency and Resource Management Council (EERMC) on October 8, 2020.

Q. Are you sponsoring any attachments through your testimony?

A. Yes. The proposed Plans are attached as Schedules A & B to our testimony. Moreover, the Annual Plan includes the following Attachments, which we are also sponsoring:

[1] Presently, members of the EE TWG include: The Company, the Division and the Division's consultant, Green Energy Consumers Alliance, the Office of Energy Resources, and Acadia Center. In addition, The City of Providence, The George Wiley Center, The Center for Justice, the Rhode Island Infrastructure Bank (RIIB), and several EERMC members and representatives from the EERMC's Consulting Team participate in the EE TWG. The EE TWG was previously referred to as the "Collaborative."

Attachment 1: 2021 Residential and Income Eligible EE Solutions and Programs;

Attachment 2: 2021 Commercial and Industrial (C&I) EE Solutions and Programs

Attachment 3: 2021 Evaluation, Measurement, and Verification Plan

Attachment 4: 2021 Rhode Island Test Description

Attachment 5: 2021 Electric Energy Efficiency Program Tables

Attachment 6: 2021 Gas Energy Efficiency Program Tables

Attachment 7: 2021 Bill and Rate Impacts

Attachment 8: 2021 Pilots, Demonstrations and Assessment

Attachment 9: 2021 Cross-Program Summary

III. THE THREE-YEAR PLAN

Q. Please describe the Company's Three-Year Plan.

A. The Three-Year Plan outlines the Company's overall programmatic focus and strategies, including illustrative and provisional ranges of budgets, associated potential resulting system benefits charges, and savings goals for the three years of implementation. It lays out a vision for National Grid's continued transformation of the energy efficiency sector in Rhode Island, including key themes and areas of focus for 2021-2023 that will then be further developed in each subsequent Annual Plan. The Three-Year Plan also defines the structure of a new performance incentive mechanism (PIM) for the Energy Efficiency portfolios as noted in Section 11 of the Three-Year Plan.

Q. What is the Three-Year Plan expected to accomplish?

A. Cumulatively, the proposed investments for years 2021 – 2023 in the Three-Year Plan will create total net annual savings of 442,076 – 460,689 MWh (electric) and 1,398,927 – 1,561,692 MMBtu (natural gas), and net lifetime savings of 4,678,382 – 4,905,459 MWh (electric) and 14,468,336 – 16,553,713 MMBtu (natural gas). Achieving these goals will generate benefits between $2.5 - $2.7 billion over the life of the measures, with $2.0 – $2.1 billion in benefits coming from electric efficiency and $500 – $600 million from natural gas efficiency. The electric, gas, and delivered fuel energy efficiency measures proposed for years 2021 – 2023 in this Three-Year Plan will avoid between 2,850,899 – 3,085,574 tons of carbon over the lifetime of the installed measures. Tables 1 through 5 in the Three-Year Plan summarize the illustrative benefits and costs proposed through the Three-Year Plan. The Company also expects that investments made in energy efficiency under the Three-Year Plan will add $1.1 - $1.2 billion to Rhode Island's Gross State Product (GSP), with every $1 spent on energy efficiency generating $1.76 - $1.77 of GSP.

Q. Are there any important changes made to this Three-Year Plan that the Company wishes to highlight?

Yes. In this Three-Year Plan, in addition to proposing binding savings goals and budgets for year 2021 (which are also included in the Company's Annual Plan), the Company is proposing a range of illustrative savings goals and budgets for years 2022 and 2023 of the

Three-Year Plan that reflect savings levels that the Company views to be achievable only in the context of a robust economic recovery in 2022 and 2023. The range for 2022 and 2023 spans from a "Base Case" to a "High Scenario." The "Base Case" of these ranges represent savings goals and budgets that the Company believes, conditional upon the economic recovery expectations, could be attained in those years. The higher end of these ranges (i.e. the "High Scenario"), which are consistent with the electric and gas savings goals presented in the "Mid Scenario" of the Market Potential Study, adjusted for known evaluation, measurement and verification impacts that differ from assumptions used in that study, do not represent savings goals that the Company believes it currently has a clear path to achieving in years 2 and 3 of the Three-Year Plan. Further discussion of the savings goals can be found in Section 9 of the Three-Year Plan.

Q. Is the inclusion of these higher values consistent with prior Three-Year Plans?

A. The inclusion of these "High Scenario" values is consistent with the use of the "Future Innovation Adder" included in the 2018-2020 Three-Year Plan (previously approved by the PUC in Docket No. 4684), where the Company recognized aspirational savings in addition to what it believed was achievable based on the information available at the time. The Company recognizes both the value of higher savings as well as the desire of stakeholders to see those savings come to fruition, and the inclusion of the higher end of the range is intended to signal to all stakeholders the Company's commitment to pursuing

and evaluating paths to this higher level of achievement, even if the viability of these pathways is not currently clear.

Statutory and Regulatory Requirements

Q. Please describe the Least Cost Procurement law and Standards.

A. The LCP statute, R.I. Gen. Laws § 39-1-27.7 and the new LCP Standards (recently approved by the PUC in Docket No. 5015) require the Company to meet the "electrical and natural gas energy needs in Rhode Island in a manner that is optimally cost effective, reliable, prudent, and environmentally responsible." R.I. Gen. Laws § 39-1-27.7.

Q. How does the Three-Year Plan meet the statutory and regulatory requirements for LCP?

A. The proposed Three-Year Plan meets the statutory and regulatory requirements for LCP by being cost effective, prudent, reliable, environmentally responsible, and because the cost of energy efficiency is less than the cost of additional supply. As noted in our discussion regarding prudency and reliability below, the goals and budgets set in the Three-Year Plan are illustrative and provisional and will guide future binding annual plans.

1. <u>Cost Effectiveness</u>

Q. Is cost effectiveness assessed at the measure, program or portfolio level?

A. As required by the revised LCP Standards, the Company has assessed the cost effectiveness of the Three-Year Plan at the program and portfolio level. In prior iterations of the LCP Standards, cost effectiveness was required exclusively at the portfolio level.

Q. What benefit-cost test was conducted by the Company?

A. In accordance with Least Cost Procurement Standards as approved in Docket No. 5015, and in effect for this Three-Year Plan, and the PUC's guidance in Docket No. 4600, the Company assessed cost effectiveness of the proposed investments using the RI Test as the primary test. The Company also provides Total Resource Cost (TRC) Test results for comparability with past plans.

Q. Are the proposed investments in the Three-Year Plan cost effective under the RI Test?

A. Yes. The electric and natural gas portfolios are cost effective under the RI Test, as shown in Table 35 of the Three-Year Plan. For example, the 2021 RI Test result for the electric portfolio shows a RI Test Benefit-Cost (BC) Ratio of 4.31. This means that for every $1 of investment in the electric portfolio $4.31 of benefits are generated. In aggregate the portfolios included in this Three-Year Plan submission are robustly cost effective, as the

benefits exceed the costs to acquire the efficiency resources and implement the programs. Across years and "Base Case" and "High Scenarios" the electric portfolio achieves a RI Test BC ratio range of 4.02 – 4.31 and the gas portfolio achieves a RI Test BC ratio range of 3.00 – 3.06. All programs within the electric and gas portfolios are also cost effective per the RI Test. Pursuant to the LCP Standards, any program with a quantified BC ratio greater than 1.0 (i.e., where quantified benefits are greater than quantified costs), should be considered cost effective. Please reference Section 8.4 of the Three-Year Plan for additional information regarding cost effectiveness.

2. <u>Prudency</u>

Q. Please summarize what the Company considers in its prudency analysis.

A. The Company considers the following factors in its prudency analysis: (1) how the investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement and what the potential for synergy savings may be based on alternatives that address multiple needs; (2) the groups of customers the Company can reach with program offerings and whether the Company can ensure that all customers are served equitably and share in the cost of energy efficiency; (3) the impacts to customer rates and bills that will be required to deliver the efficiency goals, and how can those impacts be mitigated through alternative funding, as well as the risks, if any, that customers and the Company see from the investments in energy efficiency and conservation procurements; and (4) the constraints, such as available workforce and

prevailing economic conditions, that exist in the marketplace that may impact the achievement of the goals as developed and proposed in the Three-Year Plan.

Q. Please provide a summary of the Company's analysis of each of these factors as they relate to the proposed Three-Year Plan.

A. (1) Investment supporting energy efficiency goals: This Plan secures cost effective energy efficiency resources that drive the realization of benefits as enumerated in the RI Test. In aggregate the portfolios included in this Three-Year Plan are robustly cost effective, as the benefits exceed the costs to acquire the efficiency resources and implement the programs. Further, as will be described in greater detail below, the cost of procuring electric and gas supply is less than if that electric and gas load was met by purchasing additional electric or gas supply.

(2) Equity: The Three-Year Plan is designed to ensure equity across residential programs. In the context of energy efficiency, this means programs serve all customer segments, the energy efficiency rate has parity, and energy efficiency services provide assistance to the most vulnerable customers who may pay a higher proportion of their income towards energy costs. The Company intends to continue to identify and target groups and geographic areas with historically low participation and continue to pursue opportunities to enhance the equity of the portfolios during the 2021 – 2023 period.

(3) Rate and Bill Impacts: The rate and bill impacts for electric and natural gas customers are located in Tables 24 through 33 in Section 8.1.3 of the Three-Year Plan. The tables are broken down by customer groupings, year, and illustrative "Base Case" and "High Scenario" for each of the years covered in the Three-Year Plan. Attachment 7 of the Annual Plan also provides additional details on rate and bill impacts methodology.

(4) Constraints: The Company considered the financial, workforce, customer, code, and other barriers such as dependencies on outside actors or programmatic modifications. For a more in-depth discussion of the constraints that were considered in the planning process, please see Section 9 of the Three-Year Plan.

Q. Is the proposed Three-Year Plan prudent?

A. Yes. The illustrative goals and budgets included in the Three-Year Plan provide a prudent basis upon which to establish binding goals, with the benefit of incremental information that will become available to the Company and other stakeholders between this filing and the submission of future binding Annual Plan goals and budgets. The Company will use these illustrative goals and budgets in establishing binding Annual Plan goals and budgets once it has the benefit of additional information and reduced uncertainty surrounding several factors that are critical to setting the goals and budgets, including economic conditions, customer ability and appetite to adopt energy efficiency measures during a pandemic and potential sources of funding outside of the system

benefit charge (SBC). The illustrative nature of the proposed Three-Year Plan is consistent with the mandate provided in Section 3.3(A)(ii) of the LCP Standards, which provides that the "initial budgets and goals [of the Three-Year Plan] shall be illustrative and provisional and shall guide [annual Energy Efficiency plans] over the three-year period."

3. <u>Reliability</u>

Q. Is the Three-Year Plan Reliable?

A. Yes. The illustrative goals and budgets included in the Three-Year Plan provide a reliable basis upon which to establish binding goals in future Annual Plans. As noted in our discussion regarding the prudency of the proposed Three-Year Plan, the Company will use these illustrative goals and budgets in establishing binding Annual Plan goals and budgets once it has the benefit of additional information not yet available at the time the Three-Year Plan is prepared and reduced uncertainty regarding economic conditions.

In developing this Three-Year Plan, the Company's Customer Energy Management team worked closely with program implementation professionals, industry experts, and vendors, to assess the current state of existing programs, the potential for program scalability, the economic environment, and the ability to deliver reliable energy savings as a result. Supporting the Company's efforts to deploy energy efficiency to Rhode Island customers is a robust and long-standing evaluation, measurement, and verification

(EM&V) apparatus. The Company hires independent third-party consulting firms to regularly conduct evaluation studies as part of its EM&V process. The EM&V process is continual, and every year results from EM&V studies are used to update the savings in the Technical Reference Manual (TRM) and benefit cost calculations of the measures, programs, and portfolios. Furthermore, the EM&V process supports the Company's participation of efficiency resources in the ISO-NE Forward Capacity Market (FCM). Please refer to Section 8.2 of the Three-Year Plan for additional discussion regarding reliability.

4. <u>Environmental Responsibility</u>

Q. Is the Three-Year Plan Environmentally Responsible?

A. Yes. The energy efficiency programs and portfolios provide significant emissions reductions benefits, reduce the potential environmental costs and footprint of avoided infrastructure investments, support the ongoing growth and development of a sustainable, green job ecosystem in Rhode Island, and contribute to the realization of state environmental policy goals and initiatives. The electric and natural gas portfolios, considered together across all years and the range of "Base Case" and "High Scenario," will reduce lifetime emissions of between 2.85 and 3.09 million tons of carbon dioxide. The Company's energy efficiency programs also help to ensure that the local workforce will exist to support the state's environmental policy goals. Moreover, educating and engaging residential and business customers on the potential environmental impacts and

benefits of the implementation of energy efficiency measures is a foundational element of the Company's energy efficiency go-to-market strategy. Please refer to Section 8.3 of the Three-Year Plan for additional discussion regarding environmental responsibility.

5. <u>Cost of Additional Supply</u>

Q. When analyzing the cost of additional supply as required by the LCP Standards, does the Company evaluate at the measure, program or portfolio level?

A. When analyzing the cost of additional supply, the Company evaluates at the portfolio level and not at the program or measure level. The portfolio level is appropriate to assess the cost of energy efficiency compared to additional supply because of the aggregate impact generated by the set of measures and programs included within the portfolios and the nature of some costs of energy efficiency being aggregated at portfolio level. A single measure may not be cost effective or less than the cost of additional supply when viewed on its own, however, as part of a program and portfolio it may play a key role in serving a particular market segment, enabling additional savings from complementary measures and further opportunities for customers to manage their energy use.

Q. Which mechanism is appropriate to determine what costs to include when assessing the cost of additional supply?

A. The categories of benefits and costs included in the RI Test are appropriate starting points to determine which costs to include in this assessment. The RI Test captures the aspects

of the Rhode Island Benefit Cost Framework (as included in guidance documents in Docket No. 4600) that pertain to energy efficiency programs and details what is considered a cost of energy efficiency. The RI Test includes the benefits to Rhode Island derived from investing in energy efficiency instead of investing in additional energy supply. For the purpose of the RI Test, these energy efficiency benefits are described as avoided costs. The avoided costs can also be applied as the costs of procuring additional energy supply or cost of supply. These include costs incurred by the utility to implement the Three-Year Plan and the expense borne by the customer for its share of the energy efficiency measure cost.

Q. Please describe the cost of additional supply compared to the cost of energy efficiency or conversation portfolios.

A. Across the Three-Year Plan and the "Base Case" and "High Scenario," the cost of procuring between 4,678,382 – 4,905,459 MWh of lifetime electric energy efficiency savings through the Three-Year Plan is between $347,367,903 – $364,578,538 less than the cost of purchasing additional electric supply. The cost of procuring between 14,468,336 – 16,553,713 MMBtu lifetime natural gas energy efficiency savings through the Three-Year Plan is between $53,718,499 – $62,328,085 less than the cost of purchasing additional natural gas supply. Please reference Tables 37 and 38 of the Three-Year Plan and Section 8.5 for further discussion of cost of supply.

Savings Goals

Q. Do the savings goals meet the targets approved by the PUC in Docket No. 5023?

A. No. The savings goals presented here reflect energy savings that are ambitious but also achievable under the specified circumstances conveyed in the Three-Year Plan itself. The savings goals secure significant cost savings and other benefits for Rhode Island energy consumers. These goals were developed using the Targets approved by the PUC in Docket No. 5023 for electric and natural gas energy efficiency, combined heat and power, and active electric demand response as guideposts and then applying the requisite standards of prudency and reliability that were not considered when the Targets are set. The application of these standards resulted in savings goals that do not meet the Targets approved by the PUC for the period 2021 through 2023. Tables 43, 44, and 45 show the electric and gas portfolio savings goals with associated benefits, costs, and benefit-cost results in comparison to the Targets as proposed by the EERMC and approved by the PUC.

Q. Please describe the Company's savings goals that are unique to this Three-Year Plan and why the PUC Targets were not met.

A. The Company's savings goals and associated budgets are intrinsically linked and given the primary funding mechanism for energy efficiency programs, the long-term benefits associated with savings goals must be balanced against the short-term rate impacts necessary to achieve these savings. During program planning for this Three-Year Plan and the concurrently filed Annual Plan, the Company applied more detailed cost estimates to

savings opportunities, incorporated reliability considerations (i.e. workforce, market continuity, and program scalability), further refined program plans to ensure proposed investments and program designs supported equitable access, and considered rate and bill impacts on all customers as required to meet the prudency criteria. Incorporating these considerations had the effect of reducing planned savings relative to the PUC's targets, particularly in 2021, in order to ensure that the filed plans achieve the prudency and reliability requirements as laid out in the LCP Standards.

Requested Ruling

Q. What approval is the Company seeking as it relates to the Three-Year Plan?

A. In accordance with the LCP Standards, the Company requests that the PUC approve:

1) the illustrative range of three-year energy savings goals and strategies for Energy Efficiency and Conservation Procurement programs and portfolios, provided that such goals will be updated annually in the Company's Annual Plans;
2) the illustrative range of three year budgets associated with the proposed Energy Efficiency and Conservation Procurement programs and portfolios, provided that specific budgets will be proposed, and approval sought annually through the Company's Annual Plans; and
3) the structure of the performance incentive mechanism proposed in Section 11 of the Three-Year Plan, provided that specific goals, earnings rates, allocations and target

earning opportunities will be proposed and approval sought annually through the Company's subsequent Annual Plans.

IV. THE ANNUAL PLAN

Q. Please describe the Annual Plan.

A. The Annual Plan is built as the first year of a new 2021-2023 Three-Year Energy Efficiency Plan, developed and filed concurrently. The Annual Plan provides firm savings goals, budgets, funding plans, and a proposed performance incentive mechanism earning opportunity. Further, the Annual Plan provides more detail on the strategies, market approaches, programs, and measures that will be offered in the 2021 calendar year. The Annual Plan seeks to ensure that all Rhode Island energy consumers, regardless of their geographic location, income, home ownership status, primary language, business size, or other relevant barriers are empowered to be active in their energy choices, control their energy use, and enjoy the economic, environmental, and cost savings benefits of energy efficiency.

Q. What is the Annual Plan expected to accomplish?

In total, the Annual Plan is expected to create $751,465,779 in total benefits over the life of the installed electric, demand response, and natural gas energy efficiency measures. Investments made in energy efficiency to achieve these savings will add $341,806,660 to Rhode Island's Gross State Product (GSP). The projected lifetime energy savings from

this Annual Plan will avoid 873,292 tons of carbon dioxide, the equivalent of removing 171,158 passenger vehicles from the road for one year. The electric-funded portion of the Annual Plan will create electric and delivered fuels savings of 1,306,562 net lifetime MWhs, 139,478 net annual MWhs, and 22,723 net annual kW from passive energy efficiency. In addition, the Annual Plan will generate savings of 39,339 net annual kW from active demand reduction measures. The natural gas-funded portion of the Annual Plan will create savings of 4,206,444 net lifetime MMBtu and 425,359 net annual MMBtu. Of the total $751,465,779 benefits, $606,490,655 stems from the electric portfolio and $144,975,124 is derived from the natural gas portfolio.

Q. How does the Annual Plan meet the statutory requirements for LCP?

A. The Annual Plan meets the statutory requirements for LCP by being cost effective, prudent, reliable, environmentally reliable, and because the cost of energy efficiency savings is less than the cost of additional supply.

1. <u>Cost Effectiveness</u>

Q. When assessing cost effectiveness of the proposed investments in the Annual Plan as required by the LCP Standards, does the Company evaluate at the measure, program or portfolio level?

A. Consistent with the revised LCP Standards approved in Docket 5015, both the portfolios as well as the programs proposed in the Annual Plan must be cost effective. (This is a

departure from requirements in past plans - in the most recent prior version of the LCP Standards, only portfolios were required to be cost effective). Tables 19 and 20 of the Annual Plan provide the electric and natural gas BC ratio at both the program and portfolio level.

Q. Are the programs and the portfolios proposed in the Annual Plan cost effective?

A. Yes. Attachment 5, Table E-5 shows that the proposed portfolio of electric programs, including active demand response, is expected to have a benefit/cost ratio of 4.31, which means that approximately $4.31 in benefits is expected to be created for each $1 spent on the portfolio. Attachment 6, Table G-5 shows that the proposed portfolio of gas programs is expected to have a BC ratio of 3.00, which means that $3.00 in benefits is expected to be created for each $1 spent on the portfolio. Each program contained within the electric and gas portfolios is also cost effective as shown in Tables E-5 and G-5, respectively. Figures 2 and 3 of the Annual Plan detail the costs and benefits for the electric and gas portfolios, respectively, calculated using the RI Test. A detailed summary of the benefits and costs included in the RI Test is included in Attachment 4 of the Annual Plan, including alignment of the electric portfolio investments to the to the Docket 4600 Benefit Cost Framework.

Attachment 5, Table E-5 and Attachment 6, Table G-5 of the Annual Plan provide the calculations of 2021 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 program goals from 2020. This increase in efficiency investment continues the progress of acquiring all energy efficiency resources that are cost effective and lower cost than supply.

2. <u>Prudency</u>

Q. What factors are considered in the Company's prudency analysis?

A. As noted in the discussion of the Three-Year Plan, the Company considers the following factors in its prudency analysis: (1) how the investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement and what the potential for synergy savings may be based on alternatives that address multiple needs; (2) the groups of customers the Company can reach with program offerings and whether the Company can ensure that all customers are served equitably and share in the cost of energy efficiency; (3) the impacts to customer rates and bills that will be required to deliver the efficiency goals, and how can those impacts be mitigated through alternative funding, as well as the risks, if any, that customers and the Company see from the investments in energy efficiency and conservation procurements; and (4) the constraints, such as available workforce and prevailing economic conditions, that exist in the marketplace that may impact the achievement of the goals as developed and proposed in the Annual Plan.

Q. Please analyze these factors as they relate to the proposed Annual Plan.

A. (1) Investment supporting energy efficiency goals: In aggregate the portfolios included in the Annual Plan submission are robustly cost effective, as the benefits exceed the costs to acquire the efficiency resources and implement the programs. The electric portfolio achieves a BC Ratio of 4.31 and the gas portfolio achieves a BC Ratio of 3.00.

(2) Equity: As noted, beginning in early 2021, the Company will work with OER to start an equity working group to further refine areas of focus. At this point, OER and National Grid envision the working group to be comprised of representatives from OER, other state agencies, National Grid, community-based organizations, advocacy organizations, and local subject matter experts in equity. The Company will also initiate several studies to better understand historic customer participation and the extent to which geography, income, homeownership status, and primary language may be different among participants and non-participants. The Company proposes to take further action in 2021 to enhance income eligible customer participation. This proposal is outlined in greater detail in Section 8.1.2 of the Annual Plan. In considering the prudency of the set of proposed investments contained in the Annual Plan, the Company has also assessed the parity among sectors along dimensions of collections, budgets, and savings. As shown in Figure 4 of the Annual Plan, there is approximate parity between the collections by a customer class and its resulting budget and savings in the electric portfolio. The only exception is the income-eligible sector where there is an established agreement amongst

the Parties that the residential and C&I customer classes use part of their collections to help cover the income eligible sector funding needs.

(3) Rate and Bill Impact: The rate and bill impacts conducted for this Annual Plan provide one quantitative data point in determining the merits of the investment in energy efficiency overall. The rate and bill impact estimates are considered in conjunction with the robust benefit cost analysis conducted on measures, programs, and portfolios included in the Annual Plan and the analysis of the cost of alternative supply compared to the proposed energy efficiency investments. Summary results for the rate and bill impacts are included in Section 8.1.4 of the Annual Plan, while additional detail is also available in Attachment 7 to the Annual Plan.

(4) Constraints: The Company considered the financial, workforce, customer, code, and other barriers such as dependencies on outside actors or programmatic modifications in developing the set of proposed programs and investments in the Annual Plan. The ongoing challenges of the COVID-19 pandemic, and specifically the desire to limit annual increases to the SBC surcharges in 2021, were identified as the key constraint in 2021 during the course of the plan development process.

Q. Is the Annual Plan Prudent?

A. Yes. For the reasons summarized in our discussion of the factors considered when assessing prudency and provided in greater detail in Section 8.1 of the Annual Plan, the Company believes that the proposed Annual Plan meets the prudency requirement as defined in the current LCP Standards.

3. <u>Reliability</u>

Q. Is the proposed Annual Plan reliable?

A. Yes. In building this Annual Plan, the Company's Customer Energy Management team worked closely with program implementation professionals, industry experts, and vendors to assess the current state of existing programs, the potential for program scalability, the prevailing economic conditions, and the ability to deliver reliable energy savings as a result. By speaking with on-the-ground implementers and engaging in discussions on regional and national best practices in the face of the COVID-19 pandemic, the Company positions the programs for success in what is a generally uncertain time. Supporting the Company's efforts to deploy energy efficiency to Rhode Island customers is a robust and long-standing evaluation, measurement, and verification (EM&V) apparatus, as noted in Section 5 of the Annual Plan.

4. <u>Environmental Responsibility</u>

Q. Is the proposed Annual Plan environmentally responsible?

A. Yes. Both electric and natural gas efficiency portfolios will make a meaningful contribution to reduction in emissions by driving reductions in customer energy usage in both the short and long term. The electric and natural gas portfolios, considered together, will reduce lifetime emissions of 873,292 tons of Carbon Dioxide. The non-embedded values of CO2 and NOx benefits generated by the Annual Plan over the lifetime of the measures are $53,440,738 and $4,192,909, respectively. These monetized benefits of non-embedded emissions are included as benefits in the RI Test. In addition, the Company's energy efficiency programs help to ensure that the local workforce will exist to support the state's environmental policy goals and plays a key role in raising customer awareness of environmental issues and the impacts of their choices. Please refer to Section 8.3 of the Annual Plan for further discussion of environmental responsibility.

5. <u>Cost of Additional Supply</u>

Q. When analyzing the cost of additional supply as required by the LCP Standards, does the Company evaluate at the measure, program or portfolio level?

A. As noted in the Three-Year Plan discussion, when analyzing the cost of additional supply, the Company evaluates at the portfolio level and not at the program or measure level. The portfolio level is appropriate to assess the cost of energy efficiency compared to additional supply because of the aggregate impact generated by the set of measures and

programs included within the portfolios. A single measure may not be cost effective or less than the cost of additional supply when viewed on its own, however, as part of a program and portfolio it may play a key role in serving a particular market segment, driving savings and further opportunities for customers to manage their energy use.

Q. Please describe the cost of additional supply compared to the cost of energy efficiency or conversation portfolios.

A. Based on the Company's calculation, the total cost of energy efficiency for the electric portfolio is $140.7 million and the total cost of electric supply is $262.0 million. This is a total savings of $121.2 million over the life of the installed energy efficiency measures from investing in energy efficiency instead of electric supply. The total cost of energy efficiency for the natural gas portfolio is $48.3 million and the total cost of natural gas supply is $62.5 million. This is a total savings of $14.2 million over the life of the installed energy efficiency measures from investing in energy efficiency instead of natural gas supply. The methodology for calculating Cost of Supply is detailed in Section 8.5 of the Annual Plan and is consistent with the methodology used in the Three-Year Plan.

Docket 4600 Goals

Q. Does the Annual Plan advance the Docket 4600 principles and goals?

A. Yes. Along with the quantitative benefits detailed in the Annual Plan, as measured by the RI Test, the energy efficiency investments and innovation planned for 2021 also advance the Docket 4600 principles and goals. The Company describes how the Annual Plan either advances, detracts, or remains neutral on achieving the Docket 4600 goals for the electric system in Table 26 of the Annual Plan.

Requested Ruling

Q. What approval is the Company seeking as it related to the Annual Plan?

A. The Company respectfully requests that the PUC approve the Annual Plan in its entirety. The Company specifically requests approval of the following three items:

1) The savings goals, programs, measures, budgets, and associated customer collections required to fund the energy efficiency programs in 2021. Specifically, the electric energy efficiency charge proposed for 2021 is $0.01323/kWh, the charge proposed for residential natural gas energy efficiency is $1.011/Dth and the charge proposed for commercial and industrial natural gas energy efficiency is $0.704/Dth;
2) The pilots, demonstrations, and assessments the Company proposes for program year 2021 and the associated budgets and customer collections required to fund those efforts; and

3) The performance incentive mechanism and associated earning opportunity as included in the Three-Year Plan and further detailed for 2021 in this Annual Plan.

V. CONCLUSION

Q. Does this conclude this joint testimony?

A. Yes, it does.

Schedule A
2021-2023 EE Plan

The Narragansett Electric Company
d/b/a National Grid

National Grid 2021-2023 Energy Efficiency Plan

October 15, 2020

RIPUC Docket No. 5076

Submitted to:
Rhode Island Public Utilities Commission

Submitted by:

nationalgrid

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EXECUTIVE SUMMARY AND INTRODUCTION

2021-2023 RHODE ISLAND ENERGY EFFICIENCY PLAN ROAD MAP

$2.5 - $2.7 Billion in total lifetime benefits

ECONOMIC

Good Green Jobs

Supporting Economic Recovery

Delivering Energy Savings to Rhode Island

ENERGY SAVINGS

4.7 - 4.9 TWh lifetime electric savings

$347.3 - $364.5 million less than cost of purchasing electric supply

14.4 - 16.5 million MMBtu lifetime natural gas savings

$53.7 - $62.3 million less than cost of purchasing natural gas

INVESTMENT RESULTS

$1.13 - $1.22 billion increase in Rhode Island Gross State Product

2.8 - 3.0 million tons of avoided carbon = **558,752 - 604,746** cars off the road

71% of companies delivering energy efficiency are based in Rhode Island

nationalgrid

2021-2023 RHODE ISLAND ENERGY EFFICIENCY PLAN

National Grid's 2021-2023 Energy Efficiency Plan continues to offer the nation-leading customer energy efficiency services that provide all customers with the tools needed to take control of their energy usage and lower their costs, including access to no-cost home energy assessments and comprehensive home weatherization and efficiency upgrades for income eligible customers, opportunities to purchase high efficiency products such as thermostats and lighting upgrades through upstream vendors, and tailored programs to support commercial and industrial customers in upgrading their facilities with the latest efficiency measures to increase productivity and reduce operating costs, whether they are small businesses or large manufacturing companies.

For more information on these energy efficiency programs, tips, and other information please go to ngrid.com/save.

5 Key Priorities

- Deepen customer relationships
- Drive adoption of comprehensive measures
- Expand active demand response
- Achieve cost optimization+efficiency
- A deeper equity lens across all program planning and delivery

2 Introduction

The Narragansett Electric Company d/b/a National Grid (National Grid or the Company) submits this 2021-2023 Three Year Energy Efficiency and Conservation Procurement Plan (Three-Year Plan or Plan), submitted alongside the 2021 Annual Energy Efficiency and Conservation Procurement Plan (Annual Plan), in fulfillment of the Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006.[1]

Energy efficiency is the most cost-effective way to supply new energy and meet customers' energy needs. Customers who directly participate in energy efficiency programs save energy and see direct cost savings in the form of lower energy bills. Energy efficiency also lowers long-term base load and peak demand and reduces the need for additional generation and transmission infrastructure. This benefits all customers, regardless of whether they participate directly in the Company's efficiency programs. Efficiency programming enables the Company to deliver prudent, reliable, environmentally responsible, and cost-effective energy to Rhode Island customers, while generating a host of non-energy environmental, health, and other benefits for customers and society.

The purpose of the Three-Year Plan is to propose illustrative and provisional energy efficiency procurement budgets and savings goals that will help guide annual energy efficiency and conservation plans, and to provide the focus and strategies for the three years of program implementation that will help Rhode Island energy consumers meet their energy needs through optimally cost-effective, reliable, prudent, and environmentally responsible energy efficiency. Notably, in a departure from past Three-Year Plans, this Three-Year Plan includes both a "Base Case" as well as a "High Scenario" for illustrative budgets and savings. The "Base Case" savings and budgets include savings and required budgets that the Company believes it has a current delivery and technology pathway to achieving, assuming a robust economic recovery over the term of the Plan. As with the "Future Innovation Adder" included in the 2018-2020 Three-Year Plan, the savings and budgets included in the "High Scenario" do not represent savings that the Company currently views itself as having a clear path to achieving, but are included in order to signal a recognition of stakeholder desire for greater energy efficiency savings and a Company commitment to continued efforts towards those goals.

This Three-Year Plan is delivered in the context of rapidly changing energy and economic landscapes. The Plan has been drafted as Rhode Island and the nation grapple simultaneously with both the COVID-19 pandemic and an evolving understanding of equity and the need for re-doubled efforts to achieve shared equity goals. Investing in efficiency measures that deliver both energy and cost savings to customers, while supporting economic recovery and green jobs, is now more critical than ever. It is equally critical that the Company work with stakeholders to identify and address barriers to equitable access to energy efficiency, so that all Rhode Island energy consumers are empowered to make active energy choices, control their energy use, and enjoy the economic, environmental, and cost savings benefits of energy efficiency, regardless of their geographic location, income, homeownership status, primary language, business size, or other potential barriers.

[1] R.I. Gen. Laws §39-1-27.7

The primary goal of the Plan is to guide annual program planning to use energy efficiency to secure energy and economic cost savings for Rhode Island consumers. As this Three-Year Plan is submitted concurrently with the 2021 Annual Plan, the Company will use the final Three-Year Plan as a roadmap, while also taking into account developments between the approval of this Three-Year Plan and the submission of the 2022 and 2023 Annual Plans, in developing the more detailed Annual Energy Efficiency Program Plans and associated binding savings goals and budgets for those years.

In proposing this Plan the Company is mindful of the prevailing economic conditions, including the unknown impacts the COVID-19 pandemic will continue to have on the Rhode Island economy. The Company is also aware that energy efficiency programming can make significant contributions towards an economic recovery. To balance these considerations the Company has set the proposed investment budget for the 2021 year to ensure that there is no increase to the energy efficiency surcharge and has weighted the investments toward helping those who may be hardest hit by the economic impacts of the pandemic, including low and moderate income customers and small businesses. The Company is also increasing its investment in workforce development to mitigate the workforce losses caused by COVID-19 and to help bring new workers into growth areas of clean energy technologies. The planned programs and budgets seek to maintain the flexibility needed to ensure that we can continue to deliver nation-leading energy efficiency services and maintain and grow clean energy jobs under multiple potential scenarios for the 2021 program year, and, at the behest of stakeholders, build on an assumption of a robust economic recovery in 2022 and 2023.

Programmatic Focus and Strategies for the Three Years of Program Implementation

This Three-Year Plan seeks to maintain Rhode Island's position as a national leader in energy efficiency. It presents a robust set of ongoing efficiency programs and strategies, as well as program enhancements and innovations. The Plan details the cost-effectiveness of programs and strategies, explains how it achieves prudency and reliability, and offers a funding plan with illustrative budgets, funding sources, and savings goals. The Plan proposes a strategic set of programs and strategies that are both flexible and targeted, geared towards five key objectives across the Company's Commercial and Industrial (C&I), Residential, and Income Eligible Service (IES) sectors:

- Deepen customer relationships;
- Drive adoption of comprehensive measures;
- Expand active demand response;
- Achieve cost optimization and efficiency; and
- Apply a deeper equity lens across all program planning and delivery.

The Plan also marks a major milestone, as the transformation of the residential lighting market means that 2021 will be the final year that incentives will be offered for residential lighting at the retail level. As the highly cost-efficient savings secured in previous plan cycles from lighting decline as a portion of program portfolio savings, the Company continues to seek new opportunities to drive deeper savings and transform additional markets. Consequently, this Plan focuses on building upon existing customer

relationships to encourage comprehensive measures that accrue greater savings over their lifetime. Because these deeper and more comprehensive measures require higher upfront costs to secure the same levels of claimable energy savings that lighting provided in previous plan cycles (*i.e.*, they produce fewer savings per dollar invested), cost control and efficiency are key. The remaining measures, such as weatherization, heating, cooling and control technologies, with high savings potential and longer lifetime savings horizons, have higher costs, and while still cost effective will not deliver savings at costs comparable to lighting.

Because the low-cost savings that lighting programs have historically provided will no longer be a significant driver of savings or a cornerstone of the portfolio, the Company must now go deeper and broader to secure the next unit of efficiency. This means encouraging continuous, multi-year engagement that increases opportunities for comprehensive savings through installation of multiple efficiency measures, including new and cutting-edge technologies.

Over the next three years, National Grid will test and begin to scale new ways of achieving energy savings. Newer technologies and integrated systems come with significant product, design, and training costs, even as the lower incremental savings constrain incentive budgets. While the cost to achieve savings will therefore increase, the Company will continue to deliver cost effective efficiency programs that remain less expensive than purchasing additional supply. The effects of the COVID-19 pandemic may also continue to impact program delivery–particularly in-person services–and could therefore compound pressure on program delivery costs. In the face of this uncertainty, National Grid anticipates the need for flexibility in how energy efficiency services are delivered, and will continue to work with industry and workforce partners to prepare for and respond to unfolding events. The Company is committed, both in its immediate response and in its multi-year planning, to supporting and growing an energy efficiency workforce while adapting to the impacts and continuing uncertainties that delivery partners, workforce, and customers are experiencing.

Savings Goals

The Three-Year Plan identifies the illustrative and provisional range of energy savings goals for 2021-2023 that will secure all cost-effective energy efficiency and conservation resources that are consistent with Least Cost Procurement Standards while continuing to build the infrastructure needed to achieve desired savings and benefits.

The "Base Case" savings goals presented here aim for ambitious but achievable energy savings that will secure significant cost savings and other benefits for Rhode Island energy consumers. In Docket 5023 the Rhode Island Public Utilities Commission (Commission or PUC) approved the Rhode Island Energy Efficiency & Resource Management Council's (EERMC or Council) Proposed Energy Efficiency Savings Targets (Targets) for 2021-2023, with the exception of the proposed delivered fuels targets.[2] The goals in this Plan were developed using the Targets approved by the PUC for electric and natural gas energy

[2] RI PUC Docket 5023. Targets approved at an Open Meeting on May 8, 2020. http://www.ripuc.ri.gov/eventsactions/docket/5023page.html

efficiency and active electric demand response as guideposts, and then applying the requisite standards of prudency and reliability.

The approved Targets represent maximum program achievable potential as outlined in the 2020 Rhode Island Energy Efficiency Market Potential Study (Market Potential Study)[3], but did not account for prudency and reliability, which are requirements the Company must demonstrate in its Plans.[4] The Targets were also approved prior to a complete understanding of the likely duration and economic impact of the COVID-19 pandemic on Rhode Island's citizens, businesses, and economy was known. The savings goals proposed here therefore do not match the targets approved by the PUC for the period 2021 through 2023.

At the behest of stakeholders, and in a departure from past practice, the Company has included a range of illustrative savings goals and budgets for years 2022 and 2023 of the Three-Year Plan that reflect savings levels that the Company views to be achievable only in the context of a robust economic recovery in 2022 and 2023. The Company believes, assuming that the economic recovery expectations outlined above are met, that the "Base Case" low end of these ranges represents savings goals and budgets that meet the standard's requirements for prudency and reliability and are achievable. The higher end of these ranges, which are consistent with the electric and gas savings and Demand Response goals presented in the "Mid Scenario" of the Market Potential Study, adjusted for known evaluation, measurement, and verification impacts that differ from assumptions used in that study, do not represent savings goals that the Company believes it has a clear path to achieving in years 2 and 3 of the Three-Year Plan. Achieving these higher values would require significant market, technology or breakthrough approaches that are not currently known.

The inclusion of these higher values is consistent with the use of the "Future Innovation Adder" included in the 2018-2020 Three-Year Plan (Doc. No. 4684), where the Company recognized aspirational savings in addition to what it believed was achievable based on the information available at the time. The Company recognizes both the value of higher savings as well as the desire of stakeholders to see those savings come to fruition, and the inclusion of the higher end of the range is intended to signal to all stakeholders the Company's commitment to pursuing and evaluating paths to this higher level of achievement, even if the viability of these pathways is not currently clear.

The Company will review available technologies, programs, evaluation results, and strategies with the EERMC and Technical Working Group in subsequent Annual Plans in order to achieve our commitment to delivering cost-effective energy savings that are potentially achievable through Least-Cost Procurement as set forth in statute.[5] The Three-Year Plan is consistent with the revised Least-Cost Procurement Standards as approved in Docket 4684.

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[3] Rhode Island Market Potential Study (2021-2026) https://rieermc.ri.gov/rhode-island-market-potential-study-2021-2026/

[4] The PUC acknowledged these Targets represent high goalposts for what is potentially achievable with efficiency programs, not accounting for other constraints, and that the Targets did not account for prudency and reliability, which are requirements the Company must demonstrate in its plans.

[5] R.I. Gen. Laws §39-1-27.7

The following tables summarize illustrative benefits and costs proposed in this Three-Year Plan.

Table 1. Electric Portfolio Summary, 2021 – 2023

Electric Portfolio	**2021**	**2022**		**2023**	
Savings and Benefits		**Base Case**	**High Scenario**	**Base Case**	**High Scenario**
Annual Electric Savings (MWh)	139,478	143,872	149,013	158,726	172,198
Lifetime Electric Savings (MWh)	1,306,562	1,571,295	1,634,312	1,800,526	1,964,585
Savings as a Percent of 2019 Sales	1.92%	1.98%	2.05%	2.19%	2.37%
Summer Passive Peak Demand Savings (kW)	22,723	21,866	22,774	22,776	25,104
Winter Passive Peak Demand Savings (kW)	27,695	32,657	33,690	32,045	34,695
Active Peak Demand Savings (kW)	39,339	46,452	59,682	53,656	76,181
Total Benefits (RI Test)	$606,490,655	$653,356,839	$696,592,377	$726,732,762	$830,726,438
Costs					
Total Funding Required	$122,306,026	$135,867,936	$143,189,075	$148,404,519	$166,848,275
Cost per lifetime kWh	$0.104	$0.100	$0.101	$0.095	$0.098
EE Program Charge per kWh	$0.01323	$0.01813	$0.01922	$0.02013	$0.02281
Benefit Cost Ratio (RI Test)	4.31	4.02	4.08	4.13	4.20
Benefit Cost Ratio (TRC Test)	1.95	1.81	1.84	1.86	1.91
Participation	462,114	394,616	398,176	411,247	421,954

Table 2. Natural Gas Portfolio Summary, 2021 – 2023

Natural Gas Portfolio	**2021**	**2022**		**2023**	
Savings and Benefits		**Base Case**	**High Scenario**	**Base Case**	**High Scenario**
Annual Natural Gas Savings (MMBtu)	425,359	448,390	501,616	525,178	634,717
Lifetime Natural Gas Savings (MMBtu)	4,206,444	4,635,880	5,317,230	5,626,011	7,030,038
Savings as a Percent of 2019 Sales	1.01%	1.07%	1.19%	1.25%	1.51%
Total Benefits (RI Test)	$144,975,124	$157,697,125	$181,080,604	$187,070,491	$234,086,409
Costs					

Natural Gas Portfolio	2021	2022		2023	
Savings and Benefits		**Base Case**	**High Scenario**	**Base Case**	**High Scenario**
Total Funding Required	$38,616,618	$40,839,177	$46,643,860	$47,806,605	$59,395,535
Cost per lifetime MMBtu	$11.09	$10.85	$10.86	$10.63	$10.65
Residential EE Program Charge per Dth	$1.0110	$1.2341	$1.4097	$1.4026	$1.7431
C&I EE Program Charge per Dth	$0.7040	$0.8593	$0.9816	$0.9767	$1.2138
Benefit Cost Ratio (RI Test)	3.00	3.03	3.04	3.04	3.06
Benefit Cost Ratio (TRC Test)	1.61	1.66	1.66	1.67	1.67
Participation	168,694	170,078	172,742	172,054	177,062

Table 3. 2021-2023 Docket 5023 Electric Energy Targets and Three-Year Plan Proposed Electric Energy Goals[6]

Ref	Electric Energy	2021	2022		2023	
			Base Case	**High Scenario**	**Base Case**	**High Scenario**
a	Docket 5023 Electric Energy Targets (Lifetime MWh)	1,949,782	2,037,314	2,037,314	2,059,265	2,059,265
b	Docket 5023 Electric Energy CHP Targets (Lifetime MWh)[7]	723,337	723,337	723,337	723,337	723,337
c	**Docket 5023 Electric Energy Total (Lifetime MWh) (a + b)**	**2,673,119**	**2,760,651**	**2,760,651**	**2,782,602**	**2,782,602**
d	3YP Electric Energy Goal (Lifetime MWh)	1,277,943	1,287,194	1,350,211	1,371,597	1,535,656
e	3YP CHP Energy Goal (Lifetime MWh)	28,619	284,101	284,101	428,929	428,929
f	**3YP Electric Goals Total (Lifetime MWh)**	**1,306,562**	**1,571,295**	**1,634,312**	**1,800,526**	**1,964,585**
g	Difference (f – c)	-1,366,557	-1,189,356	-1,126,339	-982,076	-818,017
h	Docket 5023 Electric Energy Targets (Annual MWh)	182,299	187,378	187,378	171,353	171,353

[6] The RI PUC approved Targets in lifetime savings units. The equivalent annual savings units from the Market Potential Study "Max Scenario" that is the source of the Targets are shown for comparability with prior Plans that used annual units.

[7] The approved targets also included 11.1 MW of annual peak demand reduction from CHP for each year of 2021 - 2023. Not shown in this table.

Ref	Electric Energy	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
i	Docket 5023 Electric Energy CHP Targets (Annual MWh)	45,209	45,209	45,209	45,209	45,209
j	**Docket 5023 Electric Energy Total (Annual MWh) (h + i)**	**227,508**	**232,587**	**232,587**	**216,562**	**216,562**
k	3YP Electric Energy Goal (Annual MWh)	138,047	129,667	134,808	137,279	150,751
l	3YP CHP Energy Goal (Annual MWh)	1,431	14,205	14,205	21,446	21,446
m	**3YP Electric Goals Total (Annual MWh) (k + l)**	**139,478**	**143,872**	**149,013**	**158,726**	**172,198**
n	Difference (m – j)	-88,030	-88,715	-83,574	-57,836	-44,364

Table 4. 2021-2023 Docket 5023 Natural Energy Targets and Three-Year Plan Proposed Natural Gas Energy Goals[8]

Ref	Natural Gas Energy	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
a	Docket 5023 Natural Gas Targets (Lifetime MMBtu)	9,598,108	9,948,779	9,948,779	9,958,127	9,958,127
b	3YP Natural Gas Goals (Lifetime MMBtu)	4,206,444	4,635,880	5,317,230	5,626,011	7,030,038
c	Difference (b – a)	-5,391,664	-5,312,899	-4,631,549	-4,332,116	-2,928,089
d	Docket 5023 Natural Gas Targets (Annual MMBtu)	749,344	770,569	770,569	787,805	787,805
e	3YP Natural Gas Goals (Annual MMBtu)	425,359	448,390	501,616	525,178	634,717
f	Difference (e – d)	-323,985	-322,179	-268,953	-262,627	-153,088

Table 5. 2021-2023 Docket 5023 Peak Demand Reduction Targets and Three-Year Plan Proposed Peak Demand Reduction Goals

Ref	Electric Peak Demand	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
a	Docket 5023 Energy Efficiency Passive Peak Demand Reduction Target (Annual MW)	30.8	33.2	33.2	33.5	33.5
b	Docket 5023 CHP Peak Demand Reduction Target (Annual MW)	11.1	11.1	11.1	11.1	11.1

[8] The RI PUC approved Targets in lifetime savings units. The equivalent annual savings units from the Market Potential Study "Max Scenario" that is the source of the Targets are shown for comparability with prior Plans that used annual units.

Ref	Electric Peak Demand	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
c	**Docket 5023 Total Energy Efficiency Passive Peak and CHP Demand Reduction Target (Annual MW) (a +b)**	**41.9**	**44.3**	**44.3**	**44.6**	44.6
d	3YP Energy Efficiency Passive Peak Demand Reduction Goal (Annual MW)	22.6	21.9	22.8	22.8	25.1
e	3YP CHP Passive Peak Demand Reduction Goal Total (Annual MW)	0.2	0.0	0.0	0.0	0.0
f	**3YP Energy Efficiency Passive Peak Demand Reduction Goal Total (Annual MW) (d + e)**	**22.7**	**21.9**	**22.8**	**22.8**	**25.1**
g	Difference (f – c)	-19.2	-22.4	-21.5	-21.8	-19.5
h	Docket 5023 Active Demand Response Peak Demand Reduction (Annual MW)	33.9	52.7	52.7	74.5	74.5
i	Dunsky Max Scenario ISO-NE Equivalent Peak			See Footnotes[9]	103	103
j	3YP Active Peak Demand Reduction Goal (Annual MW)	39.3	46.5	59.7	53.7	76.2
k	Difference (j - i)			See Footnotes	-49.3	-26.8

2.1 Benefits of Energy Efficiency

Energy efficiency programming enables the Company to deliver prudent, reliable, environmentally responsible, and cost-effective energy to Rhode Island customers, while generating a host of non-energy environmental, health, and other benefits for customers and society. In total, the illustrative savings goals in the Three-Year Plan will result in significant benefits to electric and gas customers, the Rhode Island economy, and the environment. The Three-Year Plan will create cumulative net annual savings of 442,076 – 460,689 MWh (electric) and 1,398,927 – 1,561,692 MMBtu (natural gas), and net lifetime savings of 4,678,382 – 4,905,459 MWh (electric) and 14,468,336 – 16,553,713 MMBtu (natural gas). Achieving these goals will generate benefits of more than $2.5 - $2.7 billion over the life of the measures, with $2.0 – $2.1 billion in benefits coming from electric efficiency and $500 - $600 million from natural gas efficiency.

Energy efficiency programs help create jobs and local investment in the Rhode Island economy. The Company expects that investments made in energy efficiency under the Plan will add $1.1 - $1.2 billion to Rhode Island's state GDP, with every $1 spent on energy efficiency generating $1.76 - $1.77 of state

[9] The ISO-NE equivalent peak demand reduction targets from Appendix G of the Market Potential Study are shown in this table for year 2023. This study result is comparable to the method by which National Grid tracks and reports peak reductions and is more comparable than the Target value. Appendix G from the MPS does not provide ISO-NE equivalent values for 2021 and 2022. See the EERMC's website for detailed Appendix G file: http://rieermc.ri.gov/wp-content/uploads/2020/05/ri-study-appendix-g-read-only.xlsx

GDP.[10] While the Plan is forward looking, a recent analysis of job impacts from National Grid's energy efficiency programs estimated that 877 full-time equivalent employees were supported by the Company's 2019 investments in energy efficiency programs for Rhode Island customers.[11] The vast majority of jobs associated with the Annual Plan's energy efficiency investments are local, because they are tied to the installation of equipment and materials; an analysis of National Grid's 2019 energy efficiency programs found that 71% of companies involved in the Company's energy efficiency programs are either headquartered or have a presence in Rhode Island.[12] Over the next three years, the Company anticipates its programs will continue to support jobs in a wide range of energy efficiency services, including jobs for independent contractors and plumbers, rebate processers, engineers, and National Grid Staff.

Energy efficiency also generates a number of positive non-energy impacts, including environmental and health benefits, for both participants and society. Environmental benefits include greenhouse gas reductions from avoided carbon dioxide emissions and improved air quality from reduced nitrogen oxide (NOX) found in smog and other dangerous particulates. The electric, gas, and delivered fuel energy efficiency measures proposed in this Plan will avoid over 2,850,899 – 3,085,574 tons of carbon over the lifetime of the installed measures.[13] This is the equivalent of removing approximately 558,752 – 604,746 passenger vehicles from the road for one year.[14] Customers participating in energy efficiency programs gain increased comfort and health from homes and businesses that are warmer in winter and cooler in summer. Weatherization also results in drier, properly ventilated buildings, lowering the risk of mold growth and illness.

The cost of procuring 4,678,382 – 4,905,459 MWh of lifetime electric energy efficiency savings through the Plan is $347,367,903 - $364,578,538 less than if that electric load was met by purchasing additional electric supply. The cost of procuring 14,468,336 – 16,553,713 MMBtu lifetime natural gas energy efficiency savings through the Plan is $53,718,499 - $62,328,085 less than if that natural gas load was met by purchasing additional natural gas supply.[15]

Energy savings and benefits are measured and verified by third-party evaluation firms.

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[10] Macroeconomic multipliers for the economic growth and job creation benefits of investing in cost-effective energy efficiency are derived from the "Review of RI Test and Proposed Methodology" prepared for National Grid by the Brattle Group on January 31, 2019

[11] RI PUC Docket 4888. "2019 Energy Efficiency Year-End Report" Attachment 5: Rhode Island 2019 Energy Efficiency Workforce Analysis Final Report. http://www.ripuc.ri.gov/eventsactions/docket/4888-NGird-Year-End%20Report%202019%20(5-15-20).pdf.

[12] Peregrine Energy Group, "Analysis and Recommendations regarding the Current and Future Workforce associated with Rhode Island Energy Efficiency Programs," May 5, 2019 (filed as part of National Grid's 2018 Year-End Report).

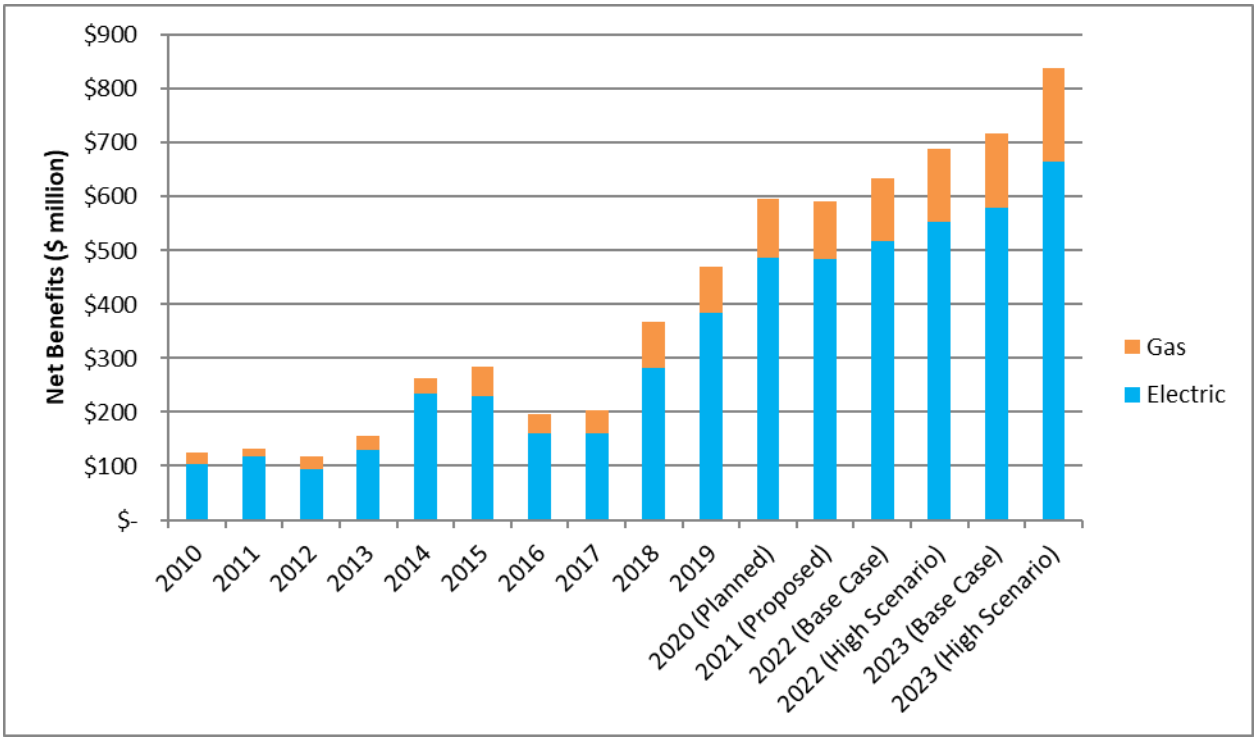
[13] Takes into account the net impact of EE measures on carbon emissions. The marginal carbon emission rates are from "Avoided Energy Supply Components in New England: 2018 Report" Appendix K. pages 368-370.

[14] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

[15] For more information on how this was calculated, see Section 3 of the Main Text, "Cost of Annual Plan Compared to the Cost of Energy Supply"

Figure 1 shows the net benefits of energy efficiency program years since 2009, with projected net benefits from this Three-Year Plan.[16]

Figure 1. Net Benefits of Energy Efficiency Plans[17]



As detailed in Table 6 and Table 7, from 2009 to 2019 the Company served 5,163,499 electric program participants,[18] resulting in cumulative annual electric savings of 1,871,538 MWh and cumulative lifetime savings of 19,207,318 MWh at an average cost of $0.0387 per lifetime kWh saved. The Company also served 969,609 gas participants,[19] resulting in cumulative annual natural gas savings of 3,659,729 MMBtu, and cumulative lifetime savings of 45,156,569 MMBtu at an average cost of $4.38 per lifetime MMBtu.

[16] In 2018 the Company adopted a new benefits framework, the Rhode Island Test, which included additional benefits from prior years. In 2020 the Company updated its macroeconomic benefits calculation using updated methodology and multipliers resulting in higher macroeconomic benefits.
[17] Net benefits calculated as total benefits minus program implementation expenses.
[18] Electric participation is aggregate and includes repeat participation by individual customers. Annual Reports include a participation analysis that details unique cumulative participation since 2012.
[19] Gas participation is aggregate and includes repeat participation by individual customers. Annual Reports include a participation analysis that details unique cumulative participation since 2012.

Table 6. Summary of 2009-2019 Electric Energy Efficiency Year End Reports

Year	Annual MWh Savings	Lifetime MWh Savings	Total Benefits ($000)	Total Spending* ($000)	TRC BC Ratio**	RI Test BC Ratio (1)	EE Program Charge/kWh	$ per lifetime kwh***	Participants
2009	81,543	899,331	$123,045	$29,536	3.02		$0.00320	$0.027	106,525
2010	81,275	929,242	$128,864	$29,712	3.73		$0.00320	$0.027	153,611
2011	96,009	1,076,778	$151,542	$39,308	3.35		$0.00526	$0.031	254,747
2012	119,666	1,288,325	$140,104	$50,719	2.24		$0.00589	$0.036	201,351
2013	159,035	1,612,371	$192,418	$72,875	2.24		$0.00862	$0.039	470,245
2014	268,468	3,278,088	$314,673	$80,321	2.69		$0.00911	$0.041	551,882
2015	222,822	2,287,785	$312,000	$82,897	2.38		$0.00942	$0.036	622,822
2016	214,329	2,034,220	$234,234	$74,274	2.16		$0.01077	$0.034	758,284
2017	232,023	2,327,916	$249,986	$90,012	1.91		$0.01124	$0.039	687,141
2018	206,209	1,848,845	$369,835	$88,123	1.88	2.99	$0.00972	$0.048	688,471
2019	190,159	1,624,417	$489,299	$104,620	2.49	3.43	$0.01121	$0.064	668,420

*Total Spending includes implementation, evaluation, commitments, EERMC, and OER. Does not include customer contribution or shareholder incentive.

**TRC Benefit/Cost Ratio = Benefits/(Implementation Expenses + Customer Contribution + Evaluation Cost + Shareholder Incentives).

***Implementation costs/Lifetime savings

**** December 2011 PUC voted to increase gas EE Program charge to $0.411/Dth.

(1) RI Test Benefit/Cost Ratio = (Energy + Capacity + Resource Benefits + Economic Benefits + Carbon Benefits + NOx Benefits) / (Program Implementation + Customer Contribution + Shareholder Incentive)

(2) B/C Ratio changed from TRC to RI Test from 2018 onwards

Table 7. Summary of 2009-2019 Natural Gas Energy Efficiency Year End Reports

Year	Annual MMBtu Savings	Lifetime MMBtu Savings	Total Benefits ($000)	Total Spending * ($000)	TRC BC Ratio**	RI Test BC Ratio (1)	EE Program Charge/Dth	$ per lifetime MMBtu***	Particip-ants
2009	195,200	2,553,828	$26,071	$6,552	2.83		$0.150	$2.44	8,339
2010	140,097	2,155,112	$26,309	$5,496	2.31		$0.150	$2.33	5,670
2011	119,613	1,623,922	$18,196	$4,868	2.21		$0.150 ****$0.411	$2.73	3,080
2012	229,811	3,300,583	$36,237	$13,310	1.68		$0.384	$3.72	11,681
2013	311,585	4,377,672	$44,747	$19,501	1.78		$0.414	$4.21	135,646
2014	409,029	5,958,381	$50,417	$20,034	2.41		$0.600 (Resi) $0.492 (C&I)	$3.84	143,655
2015	419,778	5,249,170	$54,762	$20,129	2.60		$0.781 (Resi) $0.637 (C&I)	$3.47	146,098
2016	417,820	5,282,221	$51,103	$23,135	1.93		$0.748 (Resi) $0.487 (C&I)	$4.78	150,160
2017	468,211	4,615,034	$70,972	$27,513	1.86		$0.888 (Resi) $0.726 (C&I)	$5.96	112,202
2018	497,119	5,513,499	$113,117	$27,231	2.62	3.11	$0.869 (Resi) $0.671 (C&I)	$4.94	101,423
2019	451,466	4,527,147	$115,736	$30,142	2.17	2.66	$0.715 (Resi) $0.420 (C&I)	$6.66	151,655

*Total Spending includes implementation, evaluation, commitments, EERMC, and OER. Does not include customer contribution or shareholder incentive.

**TRC Benefit/Cost Ratio = Benefits/(Implementation Expenses + Customer Contribution + Evaluation Cost + Shareholder Incentives).

***Implementation costs/Lifetime savings

**** December 2011 PUC voted to increase gas EE Program charge to $0.411/Dth.

(1) RI Test Benefit/Cost Ratio = (Energy + Capacity + Resource Benefits + Economic Benefits + Carbon Benefits + NOx Benefits) / (Program Implementation + Customer Contribution + Shareholder Incentive)

(2) B/C Ratio changed from TRC to RI Test from 2018 onwards

In sum, the benefits of the Company's implemented energy efficiency programming far outweigh the costs, providing significant cost savings to Rhode Island electric and natural gas customers. In 2020, the Company's savings trajectory has been impacted by the COVID-19 pandemic, which has touched all segments of the economy and necessitated a pause in some energy efficiency program implementation. Achievement of planned 2020 savings is likely to be negatively impacted by this significant and unanticipated situation.[20] In spite of such obstacles, the Company appreciates the opportunity to continue working with the PUC, the TWG, and the EERMC to deliver nation-leading cost-effective energy savings over the next three years and to meet growing customer demand for energy efficiency programs and services.

2.2 Three-Year Plan Development and Stakeholder Process

This Three-Year Plan was developed with entities that have historically joined the Company in settlements for the Company's Annual Plans. Together with the Company, these entities are collectively called the Technical Working Group (TWG).[21] Members of the TWG include the Rhode Island Division of Public Utilities and Carriers (Division or DPUC), Acadia Center, the Rhode Island Office of Energy Resources (OER), Green Energy Consumer's Alliance, EERMC, the City of Providence, the George Wiley Center, the Center for Justice, and the Rhode Island Infrastructure Bank. The Energy Council of Rhode Island (TEC-RI) previously participated in the TWG. The Company hosts the Technical Working Group on a monthly basis as a forum for in-depth discussion of energy efficiency topics and engages the TWG throughout the planning process to leverage their expertise and seek their feedback. In addition to TWG technical experts, the Company solicits feedback from vendors and customers to inform energy efficiency planning and implementation. This includes listening forums, surveys, results of Evaluation Measurement and Verification studies, and EERMC public meetings and comment periods.

The Company has engaged the TWG throughout the planning process to leverage their expertise and seek their feedback. In early 2020, TWG members were asked to identify their priorities for the Three-Year Plan. TWG members also previewed and provided input on key themes and major changes in a Three-Year Plan Outline Memorandum circulated in April 2020 and reviewed and provided detailed feedback on the draft 2021-2023 Three-Year Plan. The Company is grateful for the substantive critiques and innovative ideas that have come through this process of continued engagement. The Company has incorporated the priorities of TWG stakeholders into many components of this Three-Year Plan. The discussions of equity, in particular, have helped shape and elevate the Company's explicit equity commitments, establishing equity as a core overarching strategic objective of both the Three Year and Annual Plan, and adding multiple specific, measurable actions across the portfolio of efficiency programs.

In addition, this Three-Year Plan is directly informed by the Rhode Island Energy Efficiency Market Potential Study (Market Potential Study) commissioned by the EERMC and completed by Dunsky Energy Consulting in May 2020. The EERMC, OER, and DPUC managed the study, with input from National Grid. The results of this study were used by the EERMC to recommend Targets for the three-year period,

[20] https://www.cdc.gov/coronavirus/2019-ncov/index.html
[21] https://www.nationalgridus.com/ri-energy-efficiency-technical-working-group

further described in Section 9.1 of this Three-Year Plan. The Market Potential Study represents the most detailed assessment of the energy efficiency potential in the state over the next six years.

Throughout the Three-Year Plan development process, National Grid staff collaborated with the EERMC consultant team to identify measures from the Market Potential Study to inform the savings programs and strategies included in this Three-Year Plan. This has resulted in specific emphasis in program design on deeper measures of weatherization (insulation and air sealing), heating and hot water measures, particularly for residential and small business customers, and an increasing focus on combining sophisticated building and equipment controls alongside high potential measures offered to commercial and industrial customers. Building on the successes achieved through prior plans, this plan continues to expand active demand response programs.

During conversations with Stakeholders around the development of this plan, the parties determined a need to document approaches to addressing gaps between the goals outlined in this Plan and the results of the Market Potential Study that informed the Targets as approved by the PUC. Over the course of several months, the Company undertook an analysis of the top measures identified in the Potential Study and considered the barriers to adoption of these measures at levels that would support the Targets. The Company then presented and discussed these findings with stakeholders at Technical Working Group (TWG) and EERMC meetings. Further analysis was undertaken to group barriers into categories with relative weighting of the impact to achieving targets. These measures were then analyzed across five categories of barriers (financial, workforce, customer information, code, other) and ranked based on ability to deliver savings. The Company and stakeholders agree that further analysis to not only identify the impact of these barriers, but develop solutions to mitigate that impact, will be needed over the course of the Three-Year Plan. This process is already underway and will continue through the next three years.

2.3 Timeline

Per the recent updates to the Least-Cost Procurement Standards, the Company was given the option to combine the filing of the 2021-2023 Three-Year Plan with the first year (2021) of the Annual Plans, or to continue to file Plans separately. The Company elected the combined filing option with both Plans submitted to the EERMC seeking their endorsement by formal vote on October 8, 2020.[22] While the revised timeline associated with the combined filing meant the Company's 2021 Annual Plan filing was earlier than previously planned (November 2020), it also allowed more time for the Company to file the Three-Year Plan (previously planned for September 1, 2020).

The filing schedule and other key timeline considerations for 2021-2023 Three-Year and Annual Plans, as prescribed in the Standards, is summarized and detailed below. National Grid will continue to work with the EERMC and the TWG to meet these Three-Year and Annual Plan timelines.

[22] Consistent with R.I. Gen. Laws § 42-140.1-5.

Table 8. Summary of Plan Filing Schedule

Energy Efficiency and Conservation Procurement Plan	Expected Filing Date
Combined 2021-2023 Three-Year and 2021 Annual Plan	**October 15, 2020**
2022 Annual Plan	**October 1, 2021**
2023 Annual Plan	**October 1, 2022**

Combined Three-Year and First Year of Annual Energy Efficiency and Conservation Procurement Plans

Three-Year Plans that include a combined filing of the first year of Annual Plans shall be filed on or before October 15, 2020 and triennially thereafter. Prior to filing, the EERMC voted to endorse the Plans at the monthly EERMC meeting on October 8, 2020.

Subsequent Annual Energy Efficiency and Conservation Procurement Plans

All subsequent Annual Plans will be filed on or before October 1 of the year preceding the implementation year. This will include the annual program implementation plan and detailed budget for the next program year. The Annual Plan filing shall also provide any adjustments, as needed, to the remaining years of the Energy Efficiency and Conservation Procurement Plan based on experience, ramp-up, and increased assessment of the resource levels available.

National Grid will submit a draft Annual Plan to the EERMC for their review and comment at least one week before the EERMC's scheduled meeting prior to the filing date, annually. The EERMC will vote whether to endorse the Annual Plan prior to the filing date, annually.

2.4 How to Read This Plan

For ease of review, this Plan has been organized to align with the revised LCP Standards. There are three overarching sections: Strategies and Approaches to Planning; Consistency with Standards; and Funding Plan, Budget and Goals. The **Strategies and Approaches to Planning** section provides a detailed discussion of the Company's areas of program focus and priorities, high-level program descriptions, along with the major enhancements and innovations. This section also includes a discussion of the Company's approach to planned pilots and demonstrations and assessments, evaluation, measurement and verification, coordination with other energy programs, and multi-year strategies. The **Consistency with Standards** section explains how the Plan meets Prudency (including a detailed discussion of equity and rate and bill impacts), Reliability, Environmentally Responsible, and Cost Effectiveness requirements, as set forth in the LCP Standards. **The Funding Plan, Budget and Goals** detail these elements and discuss the performance incentive plan and performance metrics. **Requested rulings** are provided at the conclusion of the plan.

There are three attachments to this Three-Year Plan which provide additional detail on specific Plan elements:

- **Attachment 1 Energy Efficiency Funding;**
- **Attachment 2 Program Level Benefit Cost Summary; and**

- **Attachment 3 Definitions.**

This 2021-2023 Three-Year Plan is filed in combination with the Annual Plan. This Three-Year Plan outlines the Company's overall programmatic focus and strategies, including illustrative and provisional budgets and savings goals for the three years of implementation. It lays out a vision for National Grid's continued transformation of the energy efficiency sector in Rhode Island, including key themes and areas of focus for 2021-2023. The Annual Plan solidifies that vision for the year 2021, formalizing budgets and savings goals associated with time tested programming, while outlining program enhancements and innovations planned for 2021.

The Three-Year Plan satisfies the statutory requirements for Least Cost Procurement and the Least Cost Procurement Standards and is consistent with the concurrently filed 2021 Annual Energy Efficiency Procurement Plan (Annual Plan).[23] The overarching goal of both plans is to enable Rhode Island energy consumers to meet their energy needs through cost-effective, reliable, prudent, and environmentally responsible energy efficiency.

[23] The Company intends to submit the Annual Plan to the PUC on October 15, 2020, at the same time this Three-Year Plan is filed.

STRATEGIES AND APPROACHES TO PLANNING

3 Programs and Priorities

3.1 Strategic Overview of Programs and Priorities

The 2021-2023 Three-Year Plan sets an ambitious agenda to continue to drive energy saving benefits for Rhode Island commercial and residential consumers, while proposing new approaches to meet the challenges of the rapidly changing energy landscape. The intentional transformation of the lighting market with light-emitting diode ("LED") technology is a signature achievement of the design and implementation of prior Three-Year and Annual Plans. LED lighting moved quickly from emerging technology to rapid scale up, as the Company recognized this valuable opportunity for customers and pushed for rapid adoption through multiple channels across the portfolio. While some savings from high efficiency LED lighting are expected through 2021, the Company anticipates a saturated market by 2022, at which point lighting will no longer be a significant driver of claimable savings or a cornerstone of residential programs.

The Market Potential Study provided a detailed assessment of the energy efficiency measures that are reaching saturation and those that offer the highest remaining opportunity. It also quantified the shift in program opportunity from easy-to-install independent energy savings measures to dependence on comprehensive packages of measures with high installation costs and customer acceptance barriers. The low-cost electric energy savings opportunity presented by lighting cannot be replaced with other measures in the portfolio. The Company's focus has therefore, by necessity, shifted to programs with leaner savings opportunities and greater barriers, as well as customers who have been less able or inclined to pursue energy efficiency to date. The cost to achieve savings will increase as subsequent offerings require much more intense promotion, greater customer education and support, and higher incentive budgets, and require longer development cycles. Newer technologies and integrated systems come with significant product, design, and training costs, even as the lower incremental savings constrain incentive budgets. This Three-Year Plan reflects National Grid's commitment to identify, test, and begin to scale new ways of achieving efficiency savings with programs that go deeper and broader for the long-term benefit of Rhode Islanders, while remaining cognizant of the heightened costs of such measures and the need to maintain reasonable bills for ratepayers. The Company has created a comprehensive, multi-pronged portfolio that encourages continuous engagement and continues to deliver great customer and community benefits. The primary strategies to achieve savings goals are guided by five strategic priorities: expand and deepen customer relationships; drive adoption of comprehensive measures; expand active demand response; achieve cost optimization and efficiency; and apply an equity lens across all planning and delivery.

For Rhode Island to remain a nationwide energy efficiency leader, National Grid must innovate and create new models that increase the breadth and depth of the portfolio's reach. This means encouraging continuous, multi-year engagement that in turn increases opportunities for comprehensive savings through the installation of multiple efficiency measures, including new and cutting-edge technologies. To meet this challenge, National Grid proposes a set of programs and strategies that are both flexible

and targeted, grouped by **key themes** across the Company's Commercial and Industrial, Residential, and Income Eligible Service sectors. This Three-Year Plan is purposely designed with intensive planning and testing of program refinements and innovations in the first year.

It all starts with **deepening customer relationships** by optimizing existing tools and processes to improve residential customer targeting and marketing, while exploring new energy management frameworks for commercial and industrial customers and enhanced incentive designs for all customers that invest in deeper savings over a specific timeframe. In parallel, the Company will undertake tailored program enhancements and technology-based opportunities that **drive adoption of comprehensive measures**. This includes tailoring programs to new commercial and residential markets such as telecommunications and the sub-segment of multifamily condominiums. A new Zero Net Energy Ready and Whole Building Energy Use Intensity Reduction pathway for new construction will be incorporated and offered across all customer segments. Comprehensive technology-based measures emphasized over the next three-years include commercial Heating, Ventilation, and Air Conditioning (HVAC) systems with controls, lighting controls, and storage, while Air Source Heat Pumps will be emphasized for all customers, in support of the state's Heating Sector Transformation initiative.

National Grid will also deploy multiple forward-looking strategies and innovations that pivot the portfolio to ensure continued savings and benefits for customers. The innovations in this Three-Year Plan include expansion of the Community-Based Initiative into a new Community Solutions Initiative and a forward-looking Codes and Standards effort, both of which cut across the portfolio and seek to fundamentally broaden program partners and approaches to reach the next level of clean energy transformation. The Three-Year Plan continues to **expand active demand response** efforts that will have an impact on summer peak demand and winter reliability while supporting Rhode Island's greenhouse gas reduction goals. Active demand response offerings are included for commercial, industrial, and residential customers. The Company will also explore cutting-edge technologies, such as fuel cells and geothermal heating systems, with an aim to integrate them into the portfolio in a staged approach that supports bringing these technologies to scale. The Company will continue to assess financing programs and seek alternative funding to support program development and customer adoption to minimize increases to the customer surcharge.

In addition, **applying an equity lens** to all planning and design updates is a core strategic priority of the 2021-2023 Three-Year Plan. The Company is committed to ensuring that all customers have equal ability to access and benefit from energy efficiency programs, regardless of their geographic location, income, home ownership status, primary language, business size, or other relevant barriers; that jobs and economic development benefits of the programs reach all Rhode Island communities, with renewed emphasis on environmental justice communities; and that the energy efficiency services help the most vulnerable customers who may pay a higher proportion of their income in energy costs. Using an equity lens involves considering how programs are designed and evaluated with these goals in mind, as well as taking into account the systemic and institutional structures that may make it easier for some customers to access energy efficiency products and programs and more challenging for others. As discussed below and in Section 8.1.2 Equity, the Company is taking several steps in conjunction with OER and other stakeholders to further our empirical understanding of several facets of equity. First among these is the

creation of an equity working group composed of members of the EERMC and OER, with additional input from local experts in equity, such as statewide community-based organizations. This will help ensure that ongoing stakeholder engagement on equity issues is better informed by and includes the voices and concerns of impacted communities.

The Company is undertaking two key studies to better understand who is and who is not participating in programs: a residential non-participant study and a census of multifamily housing. In addition, National Grid will track and report to stakeholders on renter participation in the in-home/unit assessment programs, and other programs as appropriate. The Company will use data from these efforts, in combination with the insights from the aforementioned equity working group, to build program enhancements and tracking systems that incorporate the needs of identified non- or low-participating groups. It will also continue to expand and tailor marketing efforts to overcome the language-related access barriers multilingual customers face.

National Grid will focus on recruiting, training, and retaining talent from frontline and environmental justice communities, intentionally bringing more women and people of color into the energy efficiency workforce. These efforts will result in increased access to energy efficiency jobs and will help transition the workforce to better reflect the communities the Company serves. These activities will strongly support program delivery by improving customer access and experience as customers find they are increasingly working with professionals from their own communities and as these new professionals help the Company begin to identify and adjust delivery to overcome community access barriers. See Section 3.4.2 Workforce Development for more information.

In addition, the Company acknowledges the critical role that income plays in access to energy efficiency programs. The Company will increase its efforts and emphasis on identifying and encouraging customers eligible for the discount rate to move to that rate. As customers are brought into the discount rate, the Company will encourage participation in applicable efficiency programming, specifically Residential Income Eligible Services.

The Company has looked for opportunities to balance the portfolio of energy savings measures and program approaches to maximize **cost efficiency** (i.e. the amount of energy savings per dollar invested) and minimize the impact on customer bills. While all program designs maintain cost effectiveness**,** achieving optimal portfolio cost efficiency requires balancing the drive for comprehensive projects, which tend to be complex and challenging for customers to adopt and therefore have higher savings acquisition cost, with opportunities for highly cost efficient savings through programming that requires less intensive customer support, such as upstream programming, work on codes and standards..

This Three-Year Plan is delivered in the context of the COVID-19 pandemic and its devastating effects. The Company has been mindful in both its immediate efforts and its three-year planning to support and grow an energy efficiency workforce that will aid in economic recovery, while adapting to the impacts and continuing uncertainties experienced by customers, delivery partners, and the workforce.

Navigating the transition to a greatly changed energy efficiency landscape requires a willingness to engage with customers, delivery partners, and stakeholders in a continuous process of identifying the

remaining barriers to customers adopting additional energy efficiency, along with market and other systemic barriers. With these insights, the Company can continue to incrementally adjust and enhance program designs alongside its efforts to identify new approaches, technologies, and other innovations that can offer larger leaps in program innovation. The Company anticipates the first year of this Three-Year Plan to be a year of intensive planning and testing with a process of continuous enhancements to pull deeper savings from existing programs. Together these efforts will allow the Company to continuously improve the customer experience and create even greater value for customers in securing long-term savings.

Table 9 and Table 10 list the many program enhancements and innovations the Company will pursue over the next three years organized by key theme and further described in Section 3.2 Residential & Income Eligible Services Programs and Section 3.3 Commercial & Industrial Programs.

Table 9. Residential and Income Eligible Services Programs Summary

Deepen Customer Relationships and Increase Participation Across All Customers
• Enhanced Customer Targeting with Improved Customer Management Systems • Enhanced Incentives for Bundling of Measures • Explore Enhanced Finance Offers for Residential Customers
Drive Comprehensive Measure Adoption Through Tailored Program Enhancements
• Explore Potential for Scale Up of Virtual Home Energy Assessments • Increase Agility of Multifamily • Expand Capacity and Delivery Models for Income Eligible Customers • New Construction Zero Net Energy Ready Pathways
Drive Comprehensive Measure Adoption with Technology-Based Opportunities
• Expand Promotion and Installation of Air Source Heat Pumps
Expand Active Demand Response
• Grow the Residential Connected Solutions (Active Demand Response) Program

Table 10. Commercial and Industrial Programs Summary

Deepen Customer Relationships and Increase Participation Across All Customers
• New Energy Management Frameworks for Large and Medium Commercial and Industrial Customers • Enhanced Incentives for Bundling of Measures • Explore Enhanced Finance Offers for Commercial and Industrial Customers
Drive Comprehensive Measure Adoption with Tailored Program Enhancements
• New Telecommunication and Commercial Real Estate Initiatives • New Program Enhancements for Small Business Customers • Expand Community Partnerships to Bring in New Customers • New Construction Zero Net Energy Ready Pathway
Drive Comprehensive Measure Adoption with Technology-Based Opportunities
• Promote Holistic Savings by Bundling HVAC with Control Systems • Encourage the Growth of Lighting Controls • Leverage Successful Deployment of Air Source Heat Pumps and VRF Systems

Expand Active Demand Response
• Grow the C&I Connected Solutions (Active Demand Response) Program • Explore Adding Electric Vehicle Charging to the Active Demand Response Portfolio
Explore Cutting-Edge Technologies
• Explore Opportunities for Fuel Cells • Explore Incentives for Geothermal Systems

3.2 Residential & Income Eligible Services Programs

Over the next three years, National Grid will continue to offer a suite of residential energy efficiency programs, summarized in Table 11 for both market rate and income eligible customers in single and multifamily homes.

Table 11. Residential and Income Eligible Programs

Program	Description
Energy*Wise* Single Family	Direct-to-customer in-home program that educates residents on how their home can become more energy efficient. Offering single-family customers (1-4 dwelling units) home energy assessments, weatherization, and energy usage information.
Income Eligible Single Family	See Energy*Wise* Single Family above. For income eligible customers, services are delivered at no cost by local Community Action Program (CAP) agencies.
Multifamily	Comprehensive energy services for multifamily customers (five plus dwelling units), including energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting, and appliances.
Income Eligible Multifamily	See Multifamily above. For income eligible customers, services are delivered at no cost.
Residential New Construction	Promotes the construction of high-performing energy efficient single family, multifamily, and income eligible homes, as well as the education of builders, tradespeople, designers, and code officials.
Home Energy Reports	Encourages energy efficiency behavior through personalized print and email reports and a seamlessly integrated website.
ENERGY STAR® Lighting	Provides discounts to customers for the purchase of ENERGY STAR® lighting through instant rebates, promotions at retail stores, pop-up retailers, and social marketing campaigns.
Residential Consumer Products	Promotes the purchase of high efficiency household appliances carrying the ENERGY STAR® label. The program also offers refrigerator recycling.
Residential High-Efficiency Heating, Cooling, and Hot	Incentivizes the installation of high efficiency central AC for electric customers and new energy efficient natural gas related equipment

Water (ENERGY STAR® HVAC)	including boilers, furnaces, water heating equipment, thermostats, and boiler reset controls.
Residential Connected Solutions (Active Demand Response)	Uses electric active demand reduction strategies targeting consumers with eligible controllable equipment to reduce peak electrical demand periods throughout the year.

The Company's Rhode Island residential sector portfolio has successfully driven rapid, market-transforming consumer adoption of high efficiency lighting in homes and has received recognition from national organizations including the American Council for an Energy-Efficient Economy, the U.S. Environmental Protection Agency, and the U.S. Department of Energy. Yet the state's residential energy efficiency market has reached a turning point, with claimable savings from residential lighting projected to recede almost completely by 2022. This means that residential programs are at risk of losing significant visibility to customers as lighting becomes a diminishing portion of the portfolio. High efficiency bulbs directly installed in customers' homes during home energy assessments provided instant value and tangible energy savings for customers. Program-supported discounting of high efficiency lighting in retail settings was a key opportunity to showcase efficiency directly to customers in the retail market. This Three-Year Plan marks the beginning of the Company's residential programs transformation to meet the changing efficiency landscape.

National Grid plans to respond to these challenges with multiple program enhancements and innovations planned for the next three years. This Three-Year Plan reexamines the residential portfolio and aims to identify opportunities to increase participation across all customer segments, broaden penetration of energy efficiency and demand reduction to new participants, and secure deeper savings from more continuous and comprehensive engagement with existing program participants. The Company has focused heavily across all market rate and income eligible residential programs on increasing weatherization, efficient heating, and hot water. The elevation of these three critical areas reflect stakeholder priorities and opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from close collaboration with the EERMC, the EERMC Consultants, OER, the Division, vendors and customer feedback.

The residential programs are relatively mature and have successfully provided customers with incentives and support for their everyday energy choices. As the Company transitions away from lighting and in the wake of COVID-19, early focus will be on reshaping the intake and assessment process for customers, considering more virtual audits, and implementing other solutions that may reduce delivery costs and help maintain the cost effectiveness of the residential program portfolio. At the same time, intake processes must succeed in convincing customers to pursue more complex and expensive measures, such as HVAC systems. To provide services while optimizing investments, the Company must more efficiently target customers and match offers to their savings opportunities, including reshaping the Energy*W*ise program to more efficiently target homes with weatherization opportunities and connect customers with other energy saving needs to other program channels. Ultimately, the Company is likely to need to

increase incentives to move customers to action, balancing costs against greater participation and leaner delivery to maintain the portfolio's cost effectiveness. These programs will continue to offer savings for Rhode Island customers and support Rhode Island's greenhouse gas goals and the environment by enhancing energy efficiency delivery of weatherization and targeting energy savings in the heating sector.

The sections below describe a number of Residential and Income Eligible Services program enhancements and innovations the Company plans to implement in the next three years, organized by key themes that aim to increase the breadth and depth of the portfolio's reach to deliver deeper, more comprehensive savings. The level of detail varies as some elements are more conceptual in nature at this juncture. Full detail will be provided in subsequent Annual Plans.

3.2.1 Deepen Customer Relationships and Increase Participation Across All Customers

Over the next three years, the Company must find ways to become residential customers' trusted energy advisor in order to support them in more continuous, long-term engagements that can deliver deep, cost-effective savings. The saturation of the lighting market, while indicative of the Company's past program successes, puts pressure on the current high interaction model of providing an in-home professional energy assessment as a key vehicle for securing weatherization and other deeper efficiency measures. The residential team will experiment with new ways to increase participant engagement and enhance existing program delivery models to advance residential customers along a path of continuous energy efficiency improvement. The overarching vision is to transition customer relationships across all residential programs from transactional, limited term to holistic, lifetime energy engagement. The enhancements and explorations described below, including enhanced incentives, customer management systems, and finance, cut across all residential programs to support more customers to adopt deeper savings.

National Grid is committed to ensuring that customers who have a high energy burden and/or difficulty paying their electric bills participate in, and benefit from, energy efficiency programs. Equity is an essential component of this Three-Year Plan (see Section 8.1.2), and the Company's Income Eligible Services sector continues to work to assist customers who may not have as easy access to the cost savings associated with energy efficiency. National Grid will continue to work to identify and mitigate the specific barriers and challenges faced by moderate and income eligible customer sub-segments. The Company will increase its efforts and emphasis on identifying and encouraging customers eligible for the discount rate to move to the discount rate. As customers are brought into the discount rate, the Company proposes creating a welcome package to encourage participation in applicable efficiency programming, specifically Residential Income Eligible Services. The Plan also includes incorporation of incentives that eliminate the customer's cost share for weatherization (i.e. providing a no-cost offer) to moderate income customers. The Company will work with OER, the EERMC and other stakeholders to set an operating definition of moderate income in the first half of 2021.

3.2.1.1 Enhanced Customer Targeting with Improved Customer Management Systems

The Company will continue to engage in a continuous improvement process to employ and connect customer data to better target customers with offers. The process of using available data to segment customers by certain attributes allows customer service representatives to provide customized

recommendations. When a customer's call aligns with energy efficiency, the customer is directed to participate in a home energy assessment or take advantage of National Grid's marketplace for instant rebates on efficient products. The Company will continue to refine the types of customer data that can be compared and will begin to move into more proactive engagement with customers. The Company is interested in exploring ways to leverage information from online, virtual and in-person home assessments to assist in proactive customer outreach when home heating and water heating equipment is nearing replacement.

The Company will explore opportunities to target marketing to customers when they are most likely to need heating or hot water system upgrades. It is difficult for customers to learn about and be receptive to energy efficiency offerings when an expensive critical system, such as a heating or hot water system, fails. Better consumer insight will allow the Company to educate and market to customers before failure occurs, at a time when they may be more receptive to learning about new technologies. By educating customers when they may be in the market for a replacement, the Company anticipates a better overall customer experience and less stress associated with the system purchase.

In the first year of this Plan, the Company will continue work begun in 2020 to identify companies that use publicly available information to develop initial home energy efficiency scores. Once National Grid has surveyed the landscape of companies that can provide an energy score based on public data, the Company will examine how such scores might be updated based on customer input and/or program participation, starting with the online assessment and subsequently in-person or virtual assessments. This research will help inform opportunities for the program enhancements offered in second year of this Three-Year Plan.

3.2.1.2 Enhanced Incentives for Bundling of Measures

To encourage customers to add additional deeper efficiency measures, the Company will explore methods to provide enhanced incentives for customers that commit to invest in deeper energy savings over a specific timeframe. This is a step toward a "Pay for Performance" model, encouraging customers to demonstrate initiative to invest in deeper savings measures in return for a similar growth in the portion of co-investment by the Company. The objective is to develop an ongoing relationship with the customer such that they continue to utilize the energy efficiency rebates for ongoing energy upgrades. The first programs to align with such an incentive structure will be Energy*W*ise (e.g. combining weatherization with heating and cooling or hot water heaters), HVAC (e.g. bundling a boiler/furnace with a WiFi thermostat), and Income Eligible Services.

3.2.1.3 Explore Enhanced Finance Offers for Residential Customers

The Company has seen very strong uptake of the 0% interest HEAT Loan among residential customers. In addition to overcoming financial barriers, the 0% interest loan has a powerful effect in marketing energy efficiency programs, allowing customers to overcome psychological barriers to an energy audit, knowing that if the findings are significant there is a financing mechanism that would allow them to move forward. The Company has completed two HEAT Loan evaluations, both of which demonstrated that loans are provided to those who need them to overcome financial barriers. However there remain areas where the existing HEAT Loan might be further optimized.

Current options for financing energy efficiency upgrades in multifamily buildings are limited to individual condo owners through the HEAT Loan program, with no option for landlords looking to finance upgrades to their renter-occupied property. The Company will explore improvements to the HEAT Loan program that will provide financing options for landlords of both commercially and residentially metered multifamily buildings. This improvement would make it easier for owners to fund larger improvements to renter-occupied buildings, and therefore achieve deeper energy savings.

In addition, the Company will research whether Energy*Wise* residential customers are interested in an on-bill feature to spread out customer costs associated with energy efficiency upgrades. The Company will look to leverage other planned research such as the residential non-participant evaluation or C&I research on financing to answer these questions and provide insight for additional program financing enhancement.

As National Grid considers expanding financing solutions, the Company is interested in exploring interest mechanisms that would allow for larger loans or longer length loans, on-bill recovery of customer investment funded with a revolving loan fund, or opportunities for loan loss reserve funds.

3.2.2 Drive Comprehensive Measure Adoption Through Tailored Program Enhancements

3.2.2.1 Explore Potential for Scale Up of Virtual Home Energy Assessments

The EnergyWise program has been highly successful in providing Rhode Island homeowners with energy savings. The model historically relied upon a highly supportive customer experience with an in-home visit from a professional energy assessor. The in-home assessment provides an opportunity to educate customers, learn their priorities, and create immediate tangible energy savings benefits (e.g. high efficiency light bulbs and other direct install measures). The in-home assessment also allows very accurate estimation and design for weatherization (e.g. insulation and air sealing), HVAC, and water heating opportunities. The accuracy of the weatherization plans allowed for efficient delivery of insulation and air sealing measures with predictable costs and savings for the installer, the customer, and the Company. This in-home assessment as the gateway to cost-effective weatherization was heavily dependent on the low-cost savings provided by lighting measures. In response to reduced lighting opportunities, the Company began exploring opportunities to move to more virtual home energy assessments (VHEAs).

The Company had planned a systematic comparison of online customer input and virtual audit data to professional in-home audit data. The goal was to begin to understand how well virtual audits might work in replacing or at least helping screen homes for opportunities, particularly in estimating weatherization opportunities. Due to COVID-19, the residential team's roll out of VHEAs proceeded without the ability to provide a parallel in-home inspection to deliver the comparison. However, now that energy professionals can return to in-home visits, the Company can begin a closer examination and refine the process of necessary data collection, including aligning weatherization scopes and conditions, contractor needs, cost implications, and customer satisfaction. The virtual assessments are facilitated by professional auditors, and the Company pays the same fee as in-home assessments. For VHEA customers, items normally installed such as light bulbs and smart strips are mailed to customers. During COVID-19, the Company offered a 100% incentive on insulation up to $15,000, recognizing the potential

for contractors to find a different opportunity upon arrival and wanting to protect the contractor's ability to secure all efficiency without presenting the customer with an unanticipated cost. The Company will closely assess customer acceptance of a VHEAs and willingness to proceed with signed contracts for weatherization work when incentives are no longer at a 100% level. The 100% incentive provides customer protection on weatherization scope changes and customer receptivity may change without that assurance in place.

This new form of engagement necessitated by COVID-19 presents an opportunity to look at customer receptivity to efficiency and assess barriers that prevent participation. The Company will assess lessons learned from deployment of virtual home energy assessments during the COVID-19 response and make improvements to the Energy*Wise* program as appropriate. This may involve substantial adjustments to expectations of what data can be gathered from a homeowner through online or virtual audits, in what formats (i.e. response to questions versus photo uploads), and whether the online virtual audit is more effective as an assessment tool or a screening tool with in-person follow up. Changes that help unlock savings opportunities beyond lighting or reduce cost to achieve savings will receive attention.

3.2.2.2 Increase Agility of Multifamily Programs in a Changing Market

Multifamily programs came under increased focus after not meeting their electric energy savings goals in 2018 and 2019 (both in the residential market rate and income eligible multifamily programs) due to more rapid declines in lighting energy savings than anticipated for residential programs. Over the next three years, the Company will work to increase the agility of all multifamily programs (residential income eligible, residential market rate, and commercial and industrial) to respond to the significant changes in the market, including the continued decrease in claimable lighting savings and the need to more rapidly incorporate new technologies. The Company will prioritize program refinements based on evaluation results, market influence, and market saturation of technologies. The process and impact evaluations completed in July 2020 provided critical insights to inform program refinements and possible redesign. As a result of these evaluations, in the first year of this Plan the Company will work with the multifamily vendor to increase facilitation of health and safety barrier remediation, set clearer program expectations with customers by updating language and redesigning the customer energy report and sign-up sheet, and identify the long-term role of VHEAs in multifamily buildings.

In parallel, the Company will seek to better understand the characteristics of sub-segments of the multifamily market. Having been highly successful with the larger multifamily market and the single family market, National Grid will increase its focus on the 5-20 unit market in the next three years. The aim is to identify characteristics that might allow the program to achieve more success and deeper savings with these customers. The Company will continue to explore how a tiered incentive might help influence greater participation for market rate programs.

The Company will also investigate potential in the condominium market and whether additional savings are possible from refinements to the current design and delivery model. National Grid will work with the vendor who serves both the multifamily market and the Energy*Wise* delivery channel to test insights generated from working with both market segments. One vendor suggestion the Company adopted and will continue to implement is creating more parity in incentives and other program elements between

the Energy*Wise* program and multifamily delivery. The individual condominium owner shares many characteristics with the EnergyWise single family customer. Recognizing the similarities of these markets, the Company hopes reshaping delivery to provide a more consistent customer experience will support greater participation from the condominium market, more in line with current participation in Energy*Wise*.

3.2.2.3 Expand Capacity and Delivery Models for Income Eligible Customers

The Company will improve upon the 2019 Process Evaluation recommendations of the Income Eligible Services (IES) Single Family Program, which National Grid has already begun implementing. The Process Evaluation outlined key elements that will improve program efficiency, set the course for increasing customer participation, and improve consistent program implementation. The Company will assess new program management and delivery models for the IES Program that will respond to the current and future program needs. As the Company continues to expand its efforts to identify eligible customers for the gas and electric discount rates, IES will leverage the efforts to increase enrollment.

Leveraging funding from third party sources will remain a priority to expand the reach and equity of energy efficiency services. In the first year of this Plan, the IES program will implement a third-party support model to expand capacity to serve customers. To support increased participation in an equitable manner, a third-party service provider will be made available to seamlessly conduct assessments and complete weatherization projects.

3.2.2.4 New Construction Zero Net Energy Ready Pathways

Over the next three years, the goal of the New Construction program is to continue to influence the design and construction industry towards higher performing buildings, including developer attainment of LEED, Energy Star, Zero Net Energy Ready, and Passive House certifications.

The new construction program offers a unique opportunity to work at the innovative edge of high-performance building. National Grid can influence the design and construction of new buildings and additions, as well as major renovations. By engaging with the construction industry at critical moments, the Company creates opportunities to shift the building and design community towards new technologies and techniques that create ever higher performing buildings.

National Grid’s success in promoting high efficiency technologies and practices, both through the new construction and retrofit programs, has positively influenced adoption of high-performance building techniques and highly efficient technologies. This has resulted in ever-higher baselines of industry standard practice. Taken in combination with Rhode Island’s adoption of the IECC 2015 building code in late 2019 and likely adoption of at least one energy code update during the 2021-2023 Plan cycle, the elevated program baselines will result in diminished efficiency program claimable savings. The lower claimable savings will constrain the Company's ability to offer direct incentives.

To maintain and grow National Grid’s ability to influence new construction, the Company will introduce new pathways for Zero Net Energy Ready buildings and continue to refine pathways to move the industry to highest performing, zero energy buildings in 2021. The Company will explore opportunities

to quantify non-energy benefits associated with various levels of performance or certification and redesign the program to promote options that deliver higher levels of benefits.

3.2.3 Drive Comprehensive Measure Adoption with Technology-Based Opportunities

3.2.3.1 Expand Promotion and Installation of Air Source Heat Pumps

The Company will support the promotion and installation of air source heat pumps to the extent possible within regulatory guidelines. Current guidelines allow for the replacement of electric resistance heating systems with air source heat pumps and support for customer access to high efficiency heat pumps for accessory heating and cooling. At this time, regulation does not enable the Company to pursue heat pump conversion or displacement for delivered fuels. The Process Evaluation outlined key improvements to enable program efficiency and increased capacity for the number of customers that can be served each year. By offering air source heat pumps, the Company will help develop the market to enable electric resistance customers to purchase a more efficient electric heating system. Air source heat pumps also provide opportunities for customers to participate in demand response.

3.2.4 Expand Active Demand Response

3.2.4.1 Grow the Residential Connected Solutions (Active Demand Response) Program

During the next three years, Connected Solutions will grow residential active demand response through continued offerings and targeted program enhancements. Support will continue for smart thermostats, which allow customers to participate in reducing the system peak demand during a limited number of summer events. Small-scale batteries are an existing performance-based active demand response offering where up to sixty events can be called throughout the year and incentives are earned based on the amount of energy curtailed. Additionally, the Company will investigate offering an active demand response electric vehicle offering.

National Grid was able to adapt results from a Massachusetts study that looked at the evolution of smart devices and appliances and the market potential of these devices in an active demand program. Based on the results of the research, Connected Solutions now offers the top three items identified in that research. The Company will continue to watch the development and adoption of connected devices and make decisions on when to bring new technologies into the program. Additionally, National Grid provides feedback to manufacturers through its demand response management system vendor that works with nearly fifty utilities across the nation and lends more weight in signaling manufacturers about interest in connected device offerings. Location specific demand response will be pursued through non-wires alternative work and leverages the network developed through Connected Solutions.

3.3 Commercial & Industrial Programs

The Company will continue to offer its five core programs for commercial and industrial customers, summarized in Table 12, across both new and existing buildings. The Commercial and Industrial programs consistently offer highly cost-efficient savings. The Company is continuously evaluating and responding to customer needs and market dynamics to develop enhancements that secure deeper, more comprehensive savings while strategically evolving program designs to drive market transformation across multiple end uses.

Table 12. Commercial and Industrial Programs

Program	Description
Large Commercial and Industrial New Construction	Offerings target ground up new construction, major renovations, tenant fit-outs, and end of life replacement equipment. Note these offerings are also available to small business customers.
Large Commercial and Industrial Retrofit	Includes all services and technologies needed for existing building retrofits. Note these offerings are also available to small business customers.
Small Business Direct Install	Provides turn-key solutions for many types of small businesses.
Connected Solutions (Active Demand Response)	Aim to reduce peak electric demand and associated costs for large and small commercial and industrial customers
Commercial and Industrial Multifamily Program	Comprehensive energy services for market-rate multifamily customers (buildings with five plus dwelling units).

The Company has focused on non-lighting opportunities across all commercial programs and program enhancements that help drive progress toward deeper comprehensive measure adoption in every customer class. The specific priority measures vary by customer but are reflective of opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the EERMC and the EERMC consulting team, OER, the Division, and our vendors, as well as customer feedback. There are new market segment designs under development to engage new customers with tailored approaches to comprehensive savings adoption (e.g. new Telecommunication Initiative), enhancements that make participation easier or more attractive (e.g. Equipment and Systems Performance Optimization Initiative and Small Business Direct Install Program), and multiple enhancements that focus on reducing barriers to comprehensive measure adoptions (e.g. new pathways for new construction including Zero Net Energy Ready, Whole Building Energy Use Intensity Reduction, and Whole Building Streamlined).

The sections below describe a number of program enhancements and innovations the Company plans to implement in the next three years, organized by key themes that aim to increase the breadth and depth of the portfolio to deliver deeper, more comprehensive savings. The level of detail varies as some elements are more conceptual in nature at this juncture. Full detail will be provided in subsequent Annual Plans.

3.3.1 Deepen Customer Relationships and Increase Participation Across All Customers

The Strategic Energy Management Program (SEMP) offers a successful process for continuous customer engagement that delivers increasing depth and comprehensiveness of energy savings over multiple years. SEMP participants are the Company's largest customers, including large manufacturers, university campuses, and large health care systems. The SEMP partnership allows the customer to share their long-term goals and vision, which the Company uses to provide tailored support to help identify energy opportunities and approaches that align with the customers' needs. The Customer and the Company then mutually commit to a formal memorandum of understanding outlining the financial incentives tied

directly to the savings the customer commits over the next three or four years. The SEMP represents an ideal model in which customers are well educated and actively engaged in building and implementing multiyear plans, in partnership with the Company, that deliver highly cost-effective energy savings. The challenge is that this model only applies to a small number of very large customers with large savings potential and the scale to support human and financial resource commitments over a longer-term planning and investment cycle.

As the Company moves into the next three years, it is essential to find ways to achieve more continuous, long-term customer engagements that can deliver deep, cost-effective savings, applying lessons learned from SEMP to all C&I customer classes, starting with the next tier of large and medium commercial customers for whom the SEMP is not an exact fit. National Grid's C&I team aims to enhance existing program delivery models and experiment with new ways to increase participant engagement. National Grid proposes taking actions to create a culture of continuous energy efficiency improvement with this next tier of customers by addressing the specific barriers and systematically working to develop comprehensive efficiency packages and delivery that are easily accepted and adopted.

Currently the Company has six SEMP agreements in place. The Company plans to increase the number of SEMP agreements year after year to a total of nine SEMPs in 2023.

3.3.1.1 New Energy Management Frameworks for Large and Medium Commercial and Industrial Customers

The goal of the energy management framework is to create customer energy efficiency action plans that offer two to five-year efficiency roadmaps that allow customers to understand their opportunities and align those with incentive structures and support to incorporate longer term commitments to efficiency in their operations. To be successful, models must align with customers' business objectives and financial abilities without requiring substantial customer time commitment to planning.

In National Grid's current delivery model, vendors identify comprehensive opportunities and present these to customers. However, there are often barriers to a customer adopting the full suite of opportunities. In addition to the traditional energy efficiency barriers, customers often lack the will or ability to manage complex energy projects or have concerns that larger projects will require long disruptions to operations. Often larger, more complex projects require more attention that is simply not available from businesses managers, for whom energy efficiency is not a core responsibility.

Commercial customers have frameworks for normal business operations and energy efficiency tends to be outside these standardized operations frameworks. Even when a customer has a successful engagement with a vendor, i.e. offered a suite of opportunities with payback and agrees to implement, there is no automatic loop to bring the customer the next opportunity. It is highly inefficient, for both the business and the vendor, to return to assess opportunities each year. By analyzing the success factors from comprehensive multiyear customer engagements, National Grid hopes to identify best practices and translate those into tailored frameworks that can integrate into existing business operations. The Company anticipates the energy management frameworks will help vendors work with customers to review consumption data and create simplified multiyear energy action plans with annual energy reduction targets. The energy management frameworks will be tailored to each business

segment. The objective is both to increase participant engagement and to create a series of next best actions for energy efficiency improvements.

This program enhancement will require some adjustments to the current sales process and information capture. It also requires development of tools that allow the vendor to seamlessly provide the customer with a suite of near term and future opportunities and a simplified multiyear implementation plan that ensures a multiyear relationship. For example, as part of the initial energy audit, the vendor could catalog all major equipment, including the nameplate information, installed date, run hours, load/consumption data, and operation and maintenance reports if possible. Creating this shared data catalogue will allow the Company to provide customers increased insights to optimize energy using equipment, including modifications and replacement timing. The Company will look to establish a database that catalogues specific attributes associated with major equipment, including energy consumption, years in use, lifecycle, and annual maintenance hours. This catalogue will be used to tailor energy efficiency offerings, create energy action plans, and to better integrate energy efficiency measures as a solution to customer pain points.

The National Grid sales representative or vendor can use the equipment catalog to establish a multiyear (two- to five-year) energy efficiency action plan that takes into consideration equipment nearing its end of life, operation and maintenance expenses, and operational pain points. In creating the energy efficiency action plan, the sales representative/vendor can establish site energy reduction targets as a percentage of total site consumption. In conjunction with this effort, the sales representative/vendor will present the energy management frameworks in a simple template tailored to the customer's industry, business segment, or energy profile (if an industry or business segment is not available). By taking the lessons learned from prior engagements and creating these frameworks that reflect an understanding of and are easily incorporated into the businesses' standard operations, it can allow energy efficiency action to become a continuous rather than one time part of customers' business operations.

The initial target for this enhancement will be customers with significant electric and gas loads with little to no energy efficiency program engagement within the past five years. Prioritizing customers by energy efficiency potential will help the total cost efficiency. This is important because the program will be expensive, with considerable investment in developing frameworks and relationships, identifying savings opportunities, and partnering with the customer to move to action. To successfully secure these new savings opportunities, the program will need to invest in completing the data review and research to highlight and build reproducible simplified templates for action, work with vendors to ensure the audit process captures new data that allows for longer term plan development, and ensure there is a data storage system that allows the program and sales teams to anticipate and reach out to customers as next actions become available based on the longer term framework or plan.

3.3.1.2 Enhanced Incentives for Bundling of Measures

The Company will explore providing enhanced incentives to those customers that commit to implementing comprehensive energy efficiency measures within a specified timeframe. The objective is to balance longer-term and shorter-term energy savings, and to accelerate customer investments in

energy efficiency. The Company will explore two sets of comprehensive bundle types and identify which offers the best opportunity to engage customers in deeper, more comprehensive measure adoption. The first approach to bundling is at the system level, for example, HVAC units with variable frequency drives (VFDs), lighting with controls, fryers with hood vents. The theory is that the customer is already interested in an upgrade to a specific system and may be convinced, with enhanced incentives, to install additional, similar measures (i.e. bundle) to achieve greater efficiency within that energy system. The second approach is to bundle items that pair well together for specific businesses because of the businesses' energy profile and likely energy savings opportunities. For example, lighting and VFDs are frequently early high priority opportunities for many businesses.

In 2021, the Company will look at historical data on measure implementation, with attention to specific systems measures. The Company will also research how specific customer segments advance through energy efficiency to identify those struggling to advance comprehensively. This data and research review will be paired with further investigation of measures identified in the Market Potential Study with significant remaining achievable potential and filtering for measures with synergistic effects when bundled. In 2022, the Company will look to develop a bundled measure solution and offering for customers.

The Company will look at enhanced incentives as well as bounded time frames within which these bundled measures are installed. The Company will begin with a 10% incentive increase added to those custom or prescriptive measures that the customer does not initially agree to install. The Company will collect information from our salespeople and vendors to judge whether this offer increases the number of bundled measures.

3.3.1.3 Explore Enhanced Finance Offers for Commercial and Industrial Customers

The Company will identify any gaps in the large selection of financing products currently offered to C&I customers, and opportunities to enhance finance offers, while also educating customers on the value and appropriate timing of current and future finance tools. The Company wants to ensure that the barriers to investing in energy efficiency are as low as possible. As National Grid asks customers to engage more continuously and in more comprehensive projects, as described above, there will be higher costs. The Company's primary tools to alleviate cost barriers for customers are incentives and financing. The Company is committed to balancing these against each other to ensure an optimal amount of savings for the right cost.

Part of the review and refinement to finance offers will be to ensure that the finance products meet the needs of Rhode Island customers. There has been an explosion of new energy efficiency finance models over the past decade. Some are niche products that may not be taken up by Rhode Island customers. Ultimately the greater the complexity of finance offers, the higher the administrative costs to the Company of time expended developing and deploying finance products that serve very few or no customers, and the greater potential for customer and vendor confusion. This distracts from National Grid's ability to focus on optimizing and making more accessible the existing mix of finance and incentive packages that the Company knows can move customers with significant savings opportunities to action.

3.3.2 Drive Comprehensive Measure Adoption with Tailored Program Enhancements

3.3.2.1 New Telecommunication and Commercial Real Estate Initiatives

Within the large C&I retrofit program, the Company will explore adding telecommunication and commercial real estate to its successful industry-specific initiatives. National Grid has found that creating initiatives tailored to specific building types or market segments allows for a customized and efficient delivery system that supports capture of more non-lighting savings. The current Grocery Initiative, the Chain Restaurant Initiative, and the Industrial Initiative have succeeded in engaging customers by providing industry specific information from trusted industry-knowledgeable advisors. These advisors help the company offer a tailored approach to concerns and opportunities unique to the segments. These programs will also continue to be refined in the next three years.

National Grid is exploring telecommunications because of the high energy savings potential in this segment and low participation in energy efficiency. Telecommunications companies are rarely based in the Company's jurisdiction but have substantial energy using assets, including data centers and transmitters with base stations, which offer equipment replacement and HVAC opportunities. Telecommunications customers require a vendor that they trust and that they have had success working with in other areas of the country. The Company has been working to identify existing energy efficiency vendors who have established relationships with telecom companies. The Company hopes to find a vendor to work with to establish programming with these companies.

The commercial real estate market is complex, with a multitude of building types and ownership structures. In Rhode Island, this is further complicated by the relatively small size of the market. For states with a large central city or many medium-sized cities there is sufficient market size to support an active group of property management and ownership firms. Rhode Island's lack of office towers and other large holdings with common management creates challenges to efficiently targeting the sector and designing a segment initiative that can scale. To overcome this barrier, the Company is looking closely at characteristics that might offer better segmentation targets within the commercial real estate market, including building size, ownership structure, and owner occupancy, to determine if there is a segment that provides the opportunity to build a scalable initiative. In addition to the segment-specific design challenges, COVID-19 may create new challenges in these sub-segments as core market dynamics change. How and when people return to working in office settings will impact how and when commercial real estate customers will be interested in engaging. The Company will look to pursue this segment in 2022-2023.

3.3.2.2 New Program Enhancements for Small Business Customers

The Company's planned program enhancements for small businesses include digital auditing, including equipment logging, which will support long term customer engagement. Digital auditing will allow the Company to learn more about customer needs and follow up with them on measures not currently included in the direct install model. Additional enhancements include increased weatherization and a focus on increasing lighting and HVAC controls. The Company will also explore offering services like the online marketplace, similar to the residential program. All efforts recognize the inherent challenges for

small businesses with limited time, staff, and expertise to engage with the efficiency programs. These efforts focus on making small business efficiency programming easy and accessible.

3.3.2.3 Expand Community Partnerships to Bring in New Customers

The Company will work to expand community partnerships to bring in new customers. As part of the cross-cutting Community Solutions Initiative detailed in Section 3.4, the C&I team will work to develop new partnerships and engagement with industrial and technology parks in support of energy efficiency.

3.3.2.4 New Construction Zero Net Energy Ready Pathway

The goal of the New Construction program is to continue to influence the design and construction industry towards higher performing buildings including developer attainment of LEED, Energy Star, Zero Net Energy Ready and Passive House certifications.

The new construction program offers a unique opportunity to work at the innovative edge of high-performance building. National Grid can influence the design and construction of new buildings and additions, major renovations, and substantial alterations in connection with events like tenant or space changes. By engaging with the construction industry at these critical moments, the Company can create opportunities to shift the building and design community towards new technologies and techniques that create ever higher performing buildings.

National Grid's success in promoting high efficiency technologies and practices, both through the new construction and retrofit programs, has positively influenced adoption of high-performance building techniques and highly efficient technologies. This has resulted in ever-higher baselines of industry standard practice. Taken in combination with Rhode Island's adoption of the IECC 2015 building code in late 2019 and likely adoption of at least one energy code update during the 2021-2023 plan cycle, the elevated program baselines will result in diminished efficiency program claimable savings. The lower claimable savings will constrain the Company's ability to offer direct incentives.

To maintain and grow National Grid's ability to influence new construction, the Company must focus on engaging with customers early in the design process and continuing to explore and refine pathways to move the industry to highest performing, zero energy ready buildings. The key primary areas of exploration anticipated include:

- Set energy use intensity targets and an aligned path to Zero Net Energy Ready buildings, which includes post occupancy verification.
- Implement an energy conservation measures-based worksheet methodology to encourage program participation by those working on smaller buildings who do not have the design team support or timing to engage with the more comprehensive support tools of the new construction program. A simplified methodology can overcome many of the barriers that smaller projects face in adopting high-performance best practices.
- Work with architectural firms to achieve EUI targets across their entire portfolio and align with the AIA 2020 Challenge for energy performance standards. For large projects this would allow the Company to leapfrog the development process to the earliest design stages and help ensure the most aggressive energy savings techniques are considered and explored with customers at

the very earliest stage of design. The early design is also the moment of engagement that offers the most cost-effective savings opportunities.

In addition to the explorations described above, which focus on providing customers direct support for enrolled projects, the Company will study the market effects and spillover of the new construction program to help address the limitations on program savings driven by higher baselines, which are often a direct result of the program's success.

3.3.3 Drive Comprehensive Measure Adoption with Technology-Based Opportunities

Adoption of these advanced technologies are dependent on the program enhancement strategies described above and successful workforce development efforts detailed in Section 3.4.2.

3.3.3.1 Promote Holistic Savings by Bundling HVAC with Control Systems

The Company will look to identify all near-term HVAC failures and approach the customer with enhanced incentives for bundling new HVAC systems with controls. Providing enhanced incentives for the bundling of HVAC measures with controls allows the Company to offer customers a more holistic energy efficiency solution. The most significant barrier to the installation of HVAC measures and controls is the upfront capital investment. However, increasing the incentives for the bundling of HVAC, as described above, may lower this barrier and allow the customer to benefit from the more comprehensive savings that occurs when HVAC is coupled with controls. Additionally, the Company will research strategies to increase the installation of control systems on existing HVAC units.

3.3.3.2 Encourage the Growth of Lighting Controls

The Company will look to increase customer adoption of luminaires with lighting controls and network lighting controls (NLC). Luminaires with built in controls allow customers to save additional energy through daylight harvesting and more granular occupancy sensing without the need to hard wire additional sensors. A properly designed NLC project can save even more energy than luminaires with built in controls through the ability to control plug loads, provide feedback to the system controlling the HVAC, and advanced scheduling. These systems can also respond to demand response signals. Both of these pathways require additional cost and installation expertise but may yield substantial energy and non-energy benefits. In the next three years, the Company will work with experts in the lighting industry to make sure that customers and partners are trained on the benefits and proper installation of these technologies, modify incentives to encourage the growth of this area of the lighting market, and work on a system to support post installation training or check-ins to ensure the system is functioning properly over the long term.

3.3.3.3 Leverage Successful Deployment of Air Source Heat Pumps and VRF Systems

Heat pumps and Variable Refrigerant Flow (VRF) systems can be dramatically more efficient than traditional heating and cooling technologies. Understanding what makes a building a good fit, timing issues, and customer concerns are critical to further deployment of these technologies. The Company will look to define the characteristics that make for the successful deployment of air source heat pumps and VRF systems in commercial and industrial market segments for both heating and cooling applications.

3.3.4 Expand Active Demand Response

3.3.4.1 Grow the C&I Connected Solutions (Active Demand Response) Program

The Company implemented an active demand reduction program in 2019 based on the successful pilot initiated in 2017. The purpose of the demand response program is to reduce the system electrical demand on the grid during summer peak events. The active demand response program currently has two offerings: a targeted dispatch which generally targets a maximum of eight events per summer, and a daily dispatch with a maximum of 60 events.

The Connected Solutions program uses Curtailment Service Providers (CSPs) and existing energy efficiency sales teams to assess curtailment opportunities at a facility and deliver curtailment services to enrolled customers. The Company leverages the existing consultative sales approach employed for large customers to market to and recruit customers. CSPs then identify specific curtailment opportunities, as well as demand charge and Installed Capacity (ICAP) tag management opportunities and present a complete curtailment proposal to the customer.

Customers with interval meters, time of use rates, and demand charges are eligible for participation. Under the program, the Company calls an event when conditions occur that typically result in system peak. Customers and CSPs respond to dispatch signals or criteria specified by the Company, generally using a system peak trigger. Events are called the day before curtailment as needed. The goal of the offering is to call events at times of peak energy use, however daily peak calls (i.e. daily dispatch offering) may be able to access greater system benefits. For customers participating in ISO New England demand response markets, ISO New England event days are excluded from baseline calculations to avoid interfering with that program or penalizing customers for participating in both programs. The customer is incentivized to respond to event calls using performance-based incentives. Performance is measured against a baseline in alignment with ISO New England methodology.

The approach is technology agnostic. Customers can utilize single end use control strategies or combine multiple end uses and approaches to reduce demand when an event is called. Common technologies used by customers to participate in demand response include lighting with both manual and automated controls, HVAC with both manual and automated controls, process loads, scheduling changes, excess Combined Heat and Power (CHP) capacity, and energy storage. The active demand response offering provides value to large C&I customers and generates claimable benefits, primarily avoided capacity, transmission, distribution, and capacity demand reduction induced price effects.

The demand charge and ICAP tag management provide opportunities for direct bill savings to customers. This fully integrated approach relies on sales delivery teams promoting efficiency and active demand offerings to customers as they assess opportunities at customer facilities. This approach of using the existing efficiency delivery apparatus is key to the growth of C&I active demand reduction.

The robust relationships the Company has with target customers (typically large electric customers with interval meters, time of use rates, and demand charges) have been critical to the success of the program and are believed to be the source of forward progress on this new program.

Over the next three years, the Company will look to scale energy storage participation with various customer segments to reduce peak demand. As storage becomes more prevalent in the marketplace, maximizing the storage potential for demand response benefits the electrical grid to reduce peak demand, while still meeting customers' reliability needs.

3.3.4.2 Explore Adding Electric Vehicle Charging to the Active Demand Response Portfolio

Electric vehicles, similar to batteries, are becoming more prevalent in the market. They serve an opportunity to reduce peak demand on the electric grid. The Company will explore adding electric vehicle charging to the active demand response portfolio if it does not adversely affect the evaluation of the electric vehicle time of use charging pilot and appears to be a more cost-effective strategy than the current pilot.

3.3.5 Explore Cutting-Edge Technologies

3.3.5.1 Explore Opportunities for Fuel Cells

Fuel cells provide an alternative solution to traditional CHP, while offering different operational benefits that can appeal to specific customer segments. Fuel cells produce electric power using the chemical energy of a fuel stock to cleanly and efficiently produce electricity. Fuel cells work like batteries, but do not run down or need recharging. They produce electricity and heat as long as fuel is supplied. Some fuel cells can also transition to use hydrogen as the fuel stock, offering the potential for the fuel cell to be a renewable form of electricity and heat.

While it is possible to find a use for the heat produced in the fuel cell process, there are applications where fuel cells' operating characteristics are not intended for heat reclamation but rather provide resiliency or process-related benefit. The target customers for this technology are very large electricity users with critical reliability needs, such as large supermarkets and others with products or processes requiring continuous refrigeration. These customers can see multiple value chains from fuels cells while not necessarily having a parallel need for heating. For these customers, fuel cell technology holds the potential to maximize the efficiency benefit, as well as the demand reduction and other grid benefits.

The best opportunities for fuel cells are in applications with continuous electric power run cycles. Additional attention is needed to define this market, the unique and full value propositions for different customers including the performance characteristics needed, and the current state of the art of commercial systems. The Company commits to researching the performance, barriers and potential market size for fuel cell installation in Rhode Island, while continuing to work through the existing program delivery chain to serve customers now. The potential savings and benefits of fully realizing the potential of fuel cell technology both for CHP and non-CHP application are likely large. However, like CHP, the savings are uneven and hard to predict. Like traditional CHP, these projects involve substantial capital investments, complex technical requirements for installation, and long horizons for interconnection. As with the Company's approach to CHP systems, National Grid will use the Annual Plans to identify and include fuel cell projects with realistic expectations of completion within the calendar year.

3.3.5.2 Explore Incentives for Geothermal Systems

Ground-source heat pumps (GSHP) can deliver the highest energy and emissions savings of all HVAC systems, but uptake is limited due to high upfront costs. Despite these upfront costs, GSHP systems can be economically competitive over the lifetime of the equipment. As such, National Grid will continue to explore appropriate incentive options for GSHPs in the next three years, while taking into consideration additional policy and regulatory matters such as non-pipeline solutions and utility-ownership of GSHP ground loops.

3.4 Cross-Cutting Programs

3.4.1 Community-Based Initiative

The Rhode Island Community-Based initiative is the Company's energy efficiency awareness campaign grounded in deep municipal engagement whereby local officials become energy efficiency advocates, driving residential and small business participation in programs. Since 2013, the Company has successfully partnered with 23 of the state's 39 municipalities through this initiative. This initiative has resulted in greater adoption of energy efficiency measures within the community while incentivizing towns and cities in Rhode Island to focus on energy efficiency. The Company will continue to grow its in-depth partnerships with Rhode Island municipalities in 2021-2023. In the past, the Company has focused on 4-5 communities each year. National Grid will continue to engage the same number in 2021 and look to expand this initiative in 2022 and 2023.

Building upon the success and lessons learned from this initiative, the Company plans to expand these activities under a Community Solutions initiative during 2021-2023. The Community Solutions initiative will look to develop new partnerships with other types of organized communities. This will include geographic communities that encompass multiple towns (e.g. Aquidneck Island), industrial and technology parks, and other organized communities such as industry groupings with common end uses (e.g. indoor agriculture). The Community Solutions model will allow the Company to take an effective process and set of solutions developed with municipalities and expand to non-municipal communities with similar characteristics. The Community Solutions initiative will provide customers the benefit of a single point of contact for the Company's varied energy solutions including energy efficiency, EVs, demand response and other new technologies, in addition to driving deeper and greater adoption of energy efficiency measures within a given community. Additionally, the Community Solutions initiative will allow the Company to develop longer term partnerships with communities and set long-term goals that will result in adoption of more comprehensive energy efficient solutions over a longer period of time.

The key elements of all Community Solutions engagements are:

- A single point of contact;
- A shared long-term goal for the partnership including quantifiable energy efficiency savings;
- Solutions designed to meet the needs of the community; and
- Opportunity for streamlined program delivery.

These partnerships offer opportunities for customer education on technologies and energy best practices. This education element will remain a key component of the initiative. Education supports increased participation by commercial customers in facilities upgrades, as well as employee and resident participation in residential offers.

The Company plans to continue to develop mechanisms to make information on energy efficiency participation and performance within the community easily accessible to support increased action. The Company will also explore opportunities for additional external funding to support communities to execute energy efficiency measures and solutions.

3.4.2 Workforce Development

The Company anticipates increasing its workforce development budget to roughly 1 percent of total portfolio expenditures to expand the size and skillset of the efficiency workforce over the next three years. The Company will utilize a three-prong approach. First, the Company will refine efforts to quantify current workforce gaps launched in 2020, including updating analyses amidst economic volatility. Second, the Company will, beginning in January 2021, facilitate training and other professional development opportunities such as mentorship programs to help fill these gaps using approaches tailored to match the need of the particular market. Third, the Company will expand our work with Community colleges, high schools (including vocational and technical schools), and middle schools to steer more candidates toward careers in energy efficiency and leverage existing educational and job training infrastructure within the communities National Grid serves to provide additional support to disadvantaged groups. The Company will coordinate with state and local authorities, including the Department of Labor and Training's Real Jobs Rhode Island program and Rhode Island Department of Education's PrepareRI initiative, to guide the development and delivery of these efforts and help promote existing solutions to reduce or eliminate duplication of effort and expenditures.

Workforce Development efforts will complement programmatic activities aimed at increasing the adoption of advanced technologies and unlocking deeper savings. In the commercial and industrial sector, this includes training on advanced controls for HVAC and lighting and growing the commissioning workforce. In the residential and income eligible sectors, this includes engagement around advanced HVAC and heat pump design and installation. To support all sectors, the Company will build relationships with schools and communities to help grow the constrained pipeline of trades that enable energy efficiency projects like HVAC technicians, electricians, and plumbers.

3.4.3 Codes and Standards

After demonstrating the viability of energy code advancement support in 2019-2020, the Company will expand its codes and standards work from its historical focus on code compliance to advance the development and adoption of progressively more efficient energy codes (including stretch codes), appliance/equipment efficiency standards, and existing building energy performance standards. National Grid will provide technical guidance to stakeholders, including Rhode Island's Building Code Commission and OER, the U.S. Department of Energy, and others to support the development of enhanced codes and standards at the state and national levels, with efforts weighted toward the

former. The Company is committed to collaborating with stakeholders on an updated incentive mechanism for codes and standards activities targeting inclusion in the 2022 Annual Plan.

The Company will also continue the industry training and outreach activities performed under its Code Compliance Enhancement Initiative (CCEI). Pending passage of new state appliance standards, the Company will investigate providing compliance assistance services for these products to relevant market actors using a similar approach to CCEI.

Reaching untapped markets and underserved customers through this work is a key element of the Company's overarching strategy of maximizing clean energy from energy efficiency. Codes and standards development support activities will typically be made at least one year in advance of the resulting generation of savings since multiple years typically separate development, adoption, and enforcement of these policies. The Company expects to report savings generated by this expanded codes and standards initiative starting in 2022 based on efforts undertaken in 2019-2020 to support the State's current building code update process.

4 Pilots, Demonstrations, and Assessments

The Company will continue to identify opportunities to identify, test, analyze, and deliver new and innovative solutions and services that are technically feasible, desirable to customers, and viable for inclusion in the portfolio. The Company plans to explore logical program extensions like new or substitute measures, adaptations to program or delivery approaches to drive incremental improvement, and completely new offers. While the Company is always looking for incremental improvements to existing programs and offerings, the process outlined here is specifically meant to mitigate risks around totally unproven technologies and offerings and will not be applied to existing programs. The Company will use evaluation studies, customer and market research, the Market Potential Study, and stakeholder feedback to identify areas for potential exploration and will prioritize efforts based on materiality, speed of development, and area of impact. Each customer segment and savings technology has unique barriers to adoption and will be assessed on a situational basis.

Table 13. Defining Pilots, Demonstrations and Assessments[24]

	Pilot	Demonstration	Assessment
Defining Characteristics	• May result in independent program. • Long term and comprehensive engagement required to test and develop offering. • Market capabilities may need to be developed.	• Technology requires information gathering and field installations.	• Technology addresses program need that can't be met with other, more defined options. • Technology does not have a robust basis for energy savings.
Cost Effective Savings Information	Estimated savings	Estimated savings	Unknown or limited
Evaluation Options*	Vendor or Independent	Vendor or Independent	Vendor, Independent, or Internal Review
Savings Contribution to Shareholder Incentive	No	Yes	No
Cost Recovery from SBC	Yes	Yes	Yes

* Each evaluation option will include input from EERMC and OER. Evaluation option selected based on factors such as uncertainty of savings, scope of offering, and whether technology is considered a pilot, demonstration, or assessment.

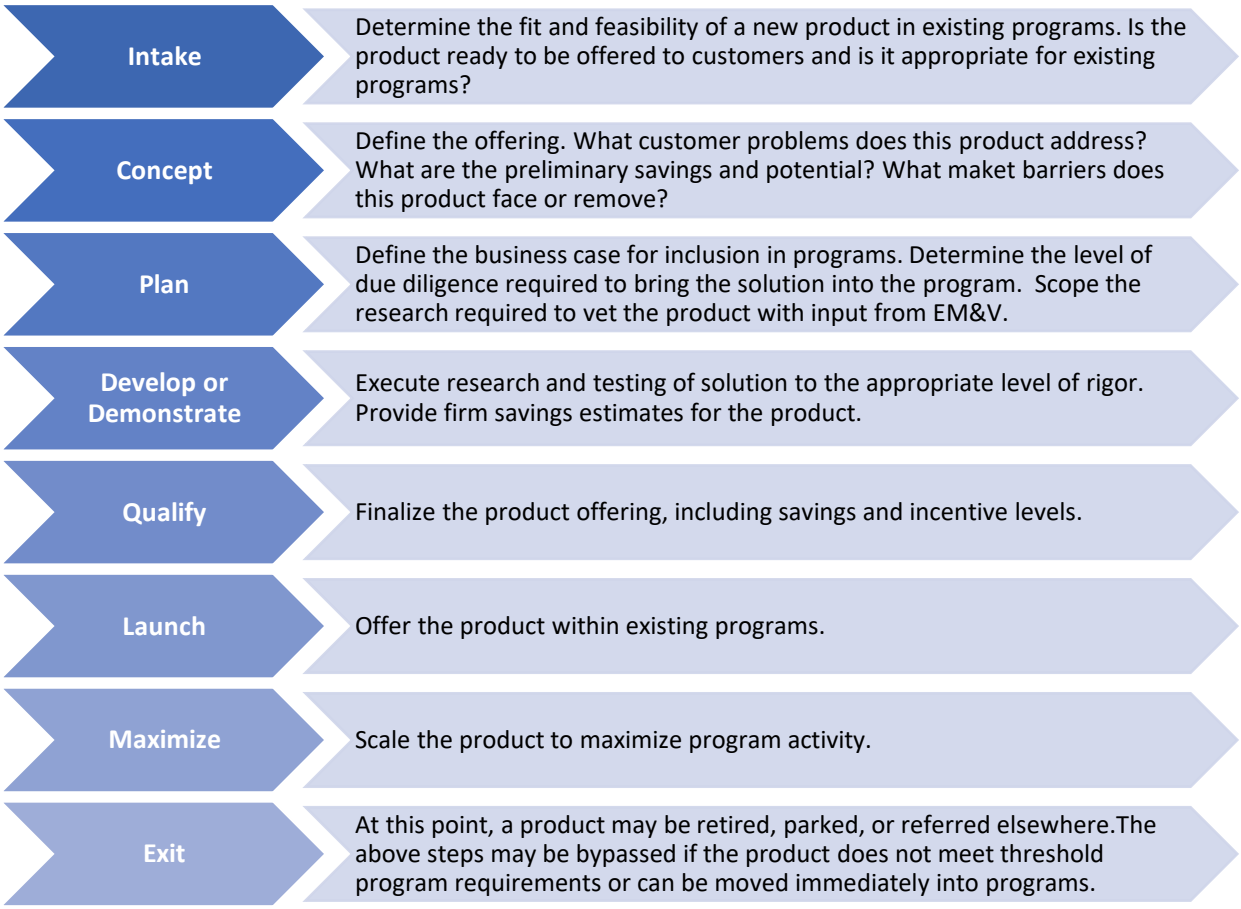
[24] Docket No. 4600-A PUC Guidance Document, October 27, 2017. Section V. Pilots.

4.1 Process to Identify and Develop Potential New Measures, Approaches, and Solutions

National Grid has a team that works within New England jurisdictions to identify and develop potential new measures, approaches, and solutions to compliment or grow programmatic offerings in efficiency, demand reduction, or optimization. In addition to a reactive response to new product and technology ideas, the Company is also proactive, participating in regional and national groups, maintaining relationships with efficiency program administrators (PAs) in other jurisdictions, and following national research. National Grid will use our regional footprint to attract and explore as many of these diverse ideas for new products, efficiency measures, demand reduction approaches, or optimization opportunities as possible. The Company will coordinate efforts with internal and external stakeholders, such as Evaluation Measurement and Verification (EM&V), Customer Energy Management (CEM), OER, and EERMC, at various points in the development process to ensure appropriately rigorous evaluation and attention is given to each pilot, demonstration, and assessment. Updates will be provided to OER and the EERMC consultant team on a quarterly basis and will solicit input during the Company's collaborative annual planning process.

The Company will continue to systematically review opportunities to add to the portfolio through a consistent and transparent process, which involves the following general stages:

Figure 2. Process for Reviewing Potential Additions to the Portfolio



National Grid uses a standardized idea intake process to ensure consistency in review for inclusion in our program offerings. The **Intake stage** is designed to ensure product/technology market readiness and compatibility within the efficiency, demand reduction, or optimization regulatory and programmatic criteria. National Grid has taken a proactive stance to finding new ideas as well as continuing to examine ideas originating internally and externally by customers, vendors, other solution providers, or stakeholders.

After the Intake stage, the Company ranks ideas based on programmatic fit, savings feasibility, and initial impression. If the idea already fits within portfolio offerings it will be referred to the appropriate program. If there is not programmatic fit or feasible savings the idea may be moved to the **Retired stage** or placed in a **Parking Lot stage** until certain specified conditions change (e.g. if a solution requires AMI as a baseline condition the Company would hold off on that type of intervention until that functionality was closer to ready). National Grid has a broad and mature portfolio of energy efficiency and demand reduction programs and measures that can accommodate many manufacturer's products and solutions. Frequently vendors and manufacturers need assistance in finding where their products and services fit. When a technology has a fit in existing offerings the Company will move to **Refer** the requestor to the existing appropriate program offerings, thus exiting and concluding the process for that idea.

Ideas determined at a cursory ranking level to be a good fit and feasible can next progress to the **Concept** stage. In the Concept stage the Company will define what problems the product addresses, where the product is expected to fit within the programs and begin to develop research questions and requirements to help define what "success" means for a given product. It is important in this stage that market barriers are considered, which could mean barriers that could inhibit uptake of the solution, or barriers the solution addresses.

Vetted concepts will move next to the **Plan** stage. In the Plan stage, the Company looks to make a business case for a given idea by assessing and estimating potential unit savings, cost of savings, likely cost-effectiveness, and materiality at scale. National Grid determines the level of due diligence required, type of evaluation necessary, and proposes the appropriate pathway for inclusion in an Annual Plan, either as a pilot, demonstration, or assessment, as defined in Three-Year Plan Attachment 3. Definitions. The Company's EM&V team, EERMC, and OER will participate in the Plan stage. The Company will determine if the pilot, demonstration, or assessment will be evaluated using an independent evaluation or a vendor evaluation during the Plan stage, depending on the specifics of the technology.

The **Develop or Demonstrate** stage will finalize scope and execute the planned research as determined in the Plan stage. During this stage, all research questions identified in the Concept and Plan stages will be answered and savings estimates finalized. Where appropriate, the Develop or Demonstrate stage will include necessary market research, customer recruitment and installation, pre and post metering, analysis, and evaluation. If the technology will be assessed by an independent evaluation, EM&V and the independent evaluator will assist in designing the demonstration and then will evaluate the installations after they are complete.

The **Qualify, Launch, and Maximize** stages all relate to post-demonstrated program eligible products and offerings. The Company will Qualify the offer including developing incentive levels, marketing approaches, implementation considerations, IT system requirements, and more. At the Launch stage the product offering will be available to customers and then look to Maximize customer uptake and savings.

4.2 Regional Collaboration to Assess Potential New Measures, Approaches, and Solutions

One example of National Grid's regional collaboration is the participation in the Massachusetts Technical Assessment Committee (MTAC), who acts as the reviewing body to assess savings claims of potential new technologies for program inclusion, if cost-effective. MTAC is both a proactive and reactive body, consisting of key Massachusetts PA technical staff including several National Grid representatives working on both the MA and RI portfolios. The committee addresses residential, commercial and industrial technologies, drawing on the subject matter experts from the committee, PA staff, or outside expertise as necessary. It establishes threshold technical requirements to qualify products or processes as eligible for program incentives. It documents its findings in a standardized manner and disseminates them to the PA program managers, technical staff, account managers, and outside parties such as vendors, customers, and other interested parties, as appropriate. Any manufacturer or vendor of an emerging or newly commercialized efficiency technology can make a science-based case for acceptance of their product into the Program Administrator offerings.

4.3 Ongoing Pilots, Demonstrations, Assessments

This subsection will detail ongoing pilots, demonstrations, and assessments initiated in prior plans that will continue during at least part of the 2021-2023 plan term, which currently include:

- Gas Demand Response

The Company plans to target 40-45 dekatherms (DTh) of hourly peak reduction in the winter of 2020/21, with the below stated DR offerings. The Company continues to expect that the majority of these peak reduction savings will come from customers participating in the full day Extended Demand Response (EDR) pilot offering, with the remainder from customers participating in PPDR pilot offering. These demand reduction pilot offerings are described in detail below. The above stated target is dependent on enrollment levels and setting an appropriate incentive level to drive participation.

- **Continuous Energy Improvement Model for Strategic Energy Management**

The Company plans to continue Continuous Energy Improvement, previously known as the Strategic Energy Management demonstration, through 2021. CEI is a set of processes for business energy management. The main goal of CEI is to activate industrial and manufacturing customers through a multiplicity of interventions, including individual and group coaching, to address operation and maintenance measures in the short term, pursue capital measures in the medium term, and, most critically, establish a culture of continuous improvement in energy performance over a longer period. The Company is also working to test new energy management frameworks for commercial and industrial customers, described in Section 3.3.1 based on lessons learned in the first year and a half of this ongoing demonstration.

- **Network Lighting Controls Plus HVAC**

The Company expects the Network Lighting Controls Plus HVAC demonstration to continue into 2021. The Company concluded the initial market readiness portion of the demonstration and is progressing into customer installations and M&V. These projects are expected to have a long lead time, so customer recruitment, installations, and savings assessment will continue into at least 2021.

- **Kitchen Exhaust**

In 2020 the Company researched three commercial kitchen products: demand control ventilation, electrostatic filtration, and energy recovery. The initial research indicated specific market barriers for each of the measures, as well as target customer characteristics. Because the Company has already incentivized a number of kitchen exhaust demand control ventilation projects in the past, the Company has decided to move kitchen exhaust demand control directly into the programs to be offered at scale to customers instead of continuing as a demonstration. The company will continue to pursue customer installations and M&V for electrostatic filtration and for energy recovery in 2021. The continued demonstration will prioritize installations at facilities with existing DCV to examine the interactivity between these three products.

- **Gas Heat Pumps**

In 2020 the Company researched available and forthcoming gas heat pump technology for applicability in the C&I sector. Initial research indicated some examples of positive customer economics and comparable system performance to existing heating and cooling systems. Further, this research indicated some opportunities for new product introduction for gas heat pumps in the Residential sector. As such, the Company is proposing to expand gas heat pump research and looks to demonstrate installations in both the Residential and C&I sectors in 2021.

4.4 Anticipated Areas of Exploration for Future Pilots, Demonstrations, Assessments

The Company will investigate new solutions and services for customers across all sectors, segments and program intervention types, in accordance with the process described above. Additionally, the Company will look for opportunities for new intervention types to continue to maintain our leadership status and innovation, while continuing to support state priorities.

The Company will continue to opportunistically collect solutions as they are raised from internal and external stakeholders, as well as seek out new solutions in emerging areas and based on the needs and gaps of the programs. All new products and solutions will be prioritized and examined through the process laid out above.

4.4.1 Residential, Multifamily, and Income Eligible Areas of Exploration

As identified in the plan, the Company expects to turn towards energy solutions with leaner savings and greater barriers as lighting opportunities diminish. This term the Company will explore solutions that offer new HVAC system options for customers, such as gas heat pumps, solutions that improve upon existing program offerings, such as alternative air sealing and insulation products, as well as ways in which existing customer solar can be used to improve the grid, as with the solar inverter direct load control demonstration. Especially since these solutions may come at a higher price point, it's important that the measures are vetted and barriers identified and eased prior to offering the solution to customers at scale.

Table 14. Residential, Multifamily, and Income Eligible Areas of Exploration

Electric	Area of Exploration	Gas	Area of Exploration
Air to Water Hydronic HPs	New or Substitute Product	**MF Shared Laundry**	Existing Buildings
Lighting Controls	New or Substitute Product	**Radiator Upgrade & Controls**	Existing Buildings
Pre-Fab Energy Retrofits	Existing Buildings	**Gas HPs**	New or Substitute Product
Hybrid Geothermal HPs	New or Substitute Product	**PV Inverter Connected Solutions**	Existing Buildings

4.4.2 Commercial & Industrial Areas of Exploration

The Commercial and Industrial programs face similar broad challenges as residential, multifamily, and income eligible programs- future energy reduction opportunities may necessarily come with higher barriers and costs compared to prior years. The Company is exploring new ways to work with customers to achieve deeper savings, as in the Continuous Energy Improvement demonstration. National Grid is broadening our performance optimizations options with solutions like the enzyme-based HVAC coil cleaning product and refrigeration leak repair. The Company is examining how to remove market barriers for new control options, like integration of HVAC controls with network lighting controls, to provide a deeper level of savings with customers. The Company will also look to solutions that may be implemented now and enable greater demand response and energy savings opportunities in the future, such as HVAC Automation for Demand response. Some of the forward-looking solutions require the Company to revisit long standing policies, such as the policy not to incentivize submetering, in order to enable future savings opportunities.

Table 15. Commercial & Industrial Areas of Exploration

Electric	Area of Exploration	Gas	Area of Exploration
Enzyme-based HVAC Coil Cleaning	Existing Buildings	**High Efficiency DOAS**	Existing Buildings
Refrigeration Leak Survey & Repair	Existing Buildings	**Radiator Upgrade & Controls**	Existing Buildings
HVAC Automation	New or Substitute Product	**Gas HPs**	New or Substitute Product
Use of Submetering to Support EE	Enabler	**PV Inverter Connected Solutions**	Existing Buildings

5 Evaluation Measurement and Verification

5.1 EM&V Process and Outlook for the Next Three Years

Evaluation, Measurement & Verification (EM&V) provides independent verification of impacts to ensure that savings and benefits claimed by the Company through its energy efficiency programs are accurate and credible. In addition, EM&V provides insight into market characteristics and guidance on program design to support continuous process improvement of energy efficiency programs.

The Company hires third-party firms to conduct evaluation using industry standards and protocols such as the International Performance Measurement and Verification Protocol (IPMVP) issued by the Efficiency Valuation Organization, Department of Energy's State and Local Energy Efficiency Action Network's Guide for States: Evaluation, Measurement, and Verification Frameworks and DOE's Uniform Methods Project evaluation guidelines. The types of evaluation may include (but not limited to) the following:

- **Impact Evaluations:** Comparisons of claimed savings against actual realized savings using methods such as literature review, billing analyses, engineering methods and onsite data logging as a means of verification.
- **Process Evaluations:** Broad examinations of existing practices, such as program delivery methods, for the purpose of gathering information to draw conclusions about effectiveness of existing processes, highlight best practices, and offer suggestions for future improvements.
- **Market Assessment Studies**: Broad studies aimed at assessing changes in market conditions, such as evolving adoption rates of current energy efficiency technologies.
- **Net-to-Gross Evaluations:** Studies aimed at quantifying the rate of free-ridership and spillover associated with energy efficiency participants and non-participants. The free-ridership rate is the percentage of savings attributable to participants who would have installed the measures in the absence of program intervention while spillover includes the effects of two components:
    1. Participants in the program who install additional energy efficient measures outside of the program as a result of participating in the program, and
    2. Non-participants who install the installation of energy efficient measures as a result of being aware of the program

The evaluation process is managed by the Company, in consultation with the EERMC and OER. The EERMC and OER follows each study closely and is involved in planning, work plan development, and results review. The results of the studies are used to update the benefit-cost calculations during

planning. The study methodologies and savings assumptions are documented in the Rhode Island Technical Reference Manual[25] and reports are published on the EERMC's website.[26]

In the next three years, the Company's EM&V efforts will continue to focus on evaluating Rhode Island customer projects, markets, and energy efficiency programs, while leveraging as many resources as possible from evaluation studies in other states where National Grid operates to maximize value for ratepayers while minimizing costs. Evaluation tasks that are planned to be conducted regionally or in conjunction with other National Grid jurisdiction will be identified following guidelines from National Grid Piggybacking Diagnostic Study[27]. This study was completed in Q1 2020 and provided guidance on when it is appropriate to "piggyback" or combine Rhode Island evaluation efforts with Massachusetts studies or adopt Massachusetts results as a proxy for RI values versus conducting stand-alone Rhode Island studies.

The study areas to be proposed in annual plans during the course of 2021-2023 will be chosen based on a number of factors including the relative amount of savings in that program or end use, the date and relative precision of the most recent evaluation study, and the available evaluation budget. Specific studies to be conducted in each program year will be determined by the Company, with input from EERMC and OER, during the annual planning process. The list of planned studies may be modified as the year progresses, and different evaluation priorities are identified. Some key research questions include issues surrounding equity, updates to the building code, demand response, and continued improvement of existing programs. Please refer to the 2021 Annual Plan for detailed descriptions of the studies planned for the coming year.

As described above, the Company's EM&V team will provide guidance beginning at the Plan stage for all pilots, demonstrations, and assessments, to ensure design and data collection are suitable to allow for effective evaluation of the pilot, demonstration, or assessment. In cases where an independent evaluation is appropriate, the EM&V team will run the evaluation with the assistance of a third-party evaluation vendor.

5.2 EM&V Studies Influencing Savings and Programs in the Three-Year Plan

The table below indicates studies that influenced savings and program design in the Three-Year Plan. Note that some listed studies intended to inform the three-year planning process were delayed from their anticipated completion date due to the ongoing COVID-19 pause in many EM&V studies and program activities. EM&V activities such as on-site data collection and customer surveys have been hampered due to COVID-19. At the beginning of the pandemic, the company put a pause on data collection efforts. Efforts have since resumed, but in a limited fashion, at a slower pace, and with a lower response rate from customers.

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[25] Rhode Island Technical Reference Manual 2020 Program Year http://rieermc.ri.gov/wp-content/uploads/2019/11/ngrid-ri-2020-trm.pdf

[26] EM&V Reports are available at https://rieermc.ri.gov/plans-reports/evaluation-studies/

[27] This study can be found at: http://rieermc.ri.gov/wp-content/uploads/2020/09/rhode-island-piggbacking-diagnostic-study-final-final-report-20200114.pdf

Table 16. Rhode Island EM&V Studies that Influenced the 2021-2023 Energy Efficiency Plan

Sector	Study name	Description	Study Completion Date (*delay due to COVID)
Res	RI-20-RX-EWSFImpact – Impact Evaluation of EnergyWise Single Family Program	The study verified energy savings estimates for measures offered through the EnergyWise Single Family program. The results of this study were used to update savings assumptions for each electric, natural gas, propane and oil measures and/or measure groups based on installations from 2017 and 2018 period.	**September 2020**
Res	RI-20-RX-EWSFProcess – Process Evaluation of EnergyWise Single Family Program	The study assessed the overall effectiveness of EnergyWise Single Family program delivery and new program elements (i.e. 100% landlord incentive and the Department of Energy home energy scores). This study also assessed free-ridership/spillover rates, offering a qualitative complement to the EnergyWise Single Family impact evaluation.	**September 2020***
Res	RI-20-RX-EWMFImpact – Impact Evaluation of Multifamily Program	The study verified energy savings estimates for measures offered through the Multifamily program. The results of this study were used to update savings assumptions for electric, natural gas, propane and oil measures based on installations from 2017 and 2018 period.	**September 2020**
Res	RI-20-RX-IEMFImpact – Impact Evaluation of Income Eligible Multifamily Program	The study verified energy savings estimates for measures offered through the Income-Eligible Multifamily program. The results of this study were used to update savings assumptions for electric, natural gas, propane and oil measures based on installations from 2017 and 2018 period..	**September 2020**
Res	RI-20-RX-EWMFProcess – Process Evaluation of Multifamily Program	The study examined customer participation, vendor participation, and overall program processes of the Multifamily program. The evaluation also assessed free-ridership/spillover rates, offering a qualitative complement to the Multifamily impact evaluation.	**September 2020***
Res	RI-20-RX-IEMFProcess – Process Evaluation of Income Eligible Multifamily Program	The study examined landlord and tenant participation, vendor participation, and overall program processes of the Income-Eligible Multifamily program. The study assessed effectiveness of program delivery procedures and determined barriers to program delivery and	**September 2020***

Sector	Study name	Description	Study Completion Date (*delay due to COVID)
		participation, offering a qualitative complement to the Income-Eligible impact evaluation.	
Res	RI-20-RX-HERImpact – Impact Evaluation of the Home Energy Reports Program	The study verified electric and natural gas savings for each group of participating customers in the HER program for periods 2017 through 2019. The study also assessed how the HER program impacts participation in other energy efficiency programs.	**August 2020**
Res	RI-20-RE-UpstrLight – Residential Lighting Market Assessment	This study assessed 2019 shelf stocking data analysis to inform planning activities for both retail and direct install lighting in 2021 and beyond.	**August 2020**
Res	RI-20-RE-UpstrLight – Residential Lighting Market Assessment1	This study assessed 2019 lighting sales data to inform planning activities for both retail and direct install lighting in 2021 and beyond.	**Expected October 2020**
Cross-cutting	RI-18-XX-Piggybacking – Piggybacking Diagnostic Study	This study assessed the validity and strategic value of Rhode Island's historic practice of using evaluation results from other states and/or leveraging evaluation studies from other states with a Rhode Island sample. This study identified key parameters for consideration when determining if a Rhode Island-specific evaluation should be undertaken. It outlined best practices for utilizing data from other states, either in combination with Rhode Island data or through direct adoption.	**January 2020**
Cross-cutting	RI-19-XX-DataCollect – Market Characterization Data Collection Study	This study collected primary data in preparation for a Market Potential Study in Rhode Island. This effort included C&I on-site data collection at 87 customer sites. The Market Potential Study was managed by the Office of Energy Resources.	**March 2020**
Cross-cutting	RI-20-XX-CSNC – Residential and Commercial New	The study will calculate the savings projected to be achieved by the Code Compliance program for the 2021-2023 period by updating the 2017 residential	**July 2020**

Sector	Study name	Description	Study Completion Date (*delay due to COVID)
	Construction and Code Compliance Study	and commercial code compliance potential savings and attribution studies. The methodology used will be determined when the policy decision has been made on whether or not to deem savings for the Code Compliance program.	
Cross-cutting	RI-19-XE-HPmarket – Heat Pump Market Assessment	The study assessed the status of the heat pump market and the potential for future growth of heat pumps in Rhode Island for displacing electric heat and for fuel switching for space heating and resulting cooling over the next five years (2020-2024). The study collected data from heat pump owners, contractors, manufacturers and distributors and reviewed existing research and evaluation in the small commercial and residential markets to understand the current status of both supply-side and demand-side markets, trends, and perceptions. The study did not reach the targeted number of completes for the C&I research area and this hindered the studies ability to complete the potential heat pump growth portion of the study for the C&I sector of the study. One of the primary drivers for the challenges with the C&I surveys is believed to be due to COVID and many C&I contacts working from home during the past summer.	**Expected October 2020***
Cross-cutting	RI-19-XX-M&VLegislation – Legislated M&V Study	The study will verify claimed energy savings from the Company's energy efficiency programs and review the Company's evaluation process as required by the M&V legislation in Rhode Island. The Company is providing full cooperation and will carefully review all recommendations and implement those that are feasible when developing future evaluations. This study is managed by the OER.	**Expected December 2020***
C&I	RI-20-CG-CustGasPY18 – Impact Evaluation of PY2018 Custom Gas Installations	The study will verified natural gas savings estimates for a sample of custom gas projects through site-specific inspection, metering, and analysis. The results of this study were used to determine the realization	**September 2020**

Sector	Study name	Description	Study Completion Date (*delay due to COVID)
		rates for custom gas energy efficiency offerings based on installations from 2018.	
C&I	RI-19-CE-CustElec – Impact Evaluation of PY2018 Custom Electric Installations	The study will verify electric savings estimates for a sample of both lighting and non-lighting custom electric projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the final realization rates for custom electric energy efficiency offerings based on installations from 2018. Due to a pause in on-site work as a result of COVID concerns, the results delivered in September and applied in the Three-Year Plan were based on desk reviews of the 2018 installations. National Grid is planning to conduct on-site M&V in 2020 for these installations, when feasible after accounting for COVID constraints.	**September 2020**
C&I	RI-20-CX-FRSO – Commercial and Industrial Free-Ridership and Spillover Study	The study will assess free-ridership and spillover values based on behavior of both participants and nonparticipants of C&I energy efficiency programs. The results will be used to quantify the net impacts of C&I electric and natural gas energy efficiency programs in Rhode Island. This study will include both custom and prescriptive measures from new construction and retrofit programs.	**Expected October 2020**
Demo	RI-20-CX-SEM – Strategic Energy Management Demonstration Evaluation	The study will review the methodologies and processes used to obtain and calculate the savings claimed. The results will be used to assist in monitoring and making continuous improvements to the demonstration.	**Expected October 2020**

6 Coordination with Other Energy Policies, Programs, and Dockets

Continuing to provide the best value to Rhode Island ratepayers necessitates that the Company coordinate with other parts of the energy system, rather than pursuing savings programs and strategies in isolation. This Three-Year Plan will be implemented in coordination with other Company filings and activities, described below. Efforts have also been taken to ensure the Three-Year Plan is aligned with relevant state policies and objectives, with specific coordination opportunities detailed below.

6.1 System Reliability Procurement and Infrastructure, Safety and Reliability

The Company will submit its System Reliability Procurement (SRP) 2021-2023 Three-Year Plan for the PUC's review and consideration in a separate filing, to be filed in November 2020. The SRP Three-Year Plan describes the strategies, goals, and funding request for SRP. The purpose of SRP is to identify targeted alternative solutions, through customer-side and grid-side opportunities, for the electric and gas distribution systems that are cost-effective, reliable, prudent and environmentally responsible and chart a path to lower supply and delivery costs for customers in Rhode Island.

The SRP Plan and its Non-Wires Alternative (NWA) proposals are separate and unique from the Energy Efficiency Plan customer measures because NWA projects are targeted solutions for electric grid reliability, as compared to energy efficiency's goal of bulk energy savings from customers for the regional electric grid. These two main distinctions are illustrated by a difference in scope of area (i.e. feeder- or substation-level for SRP versus state or regional for energy efficiency), and in scope of intent (i.e. electric grid reliability for SRP via NWA projects versus energy savings via energy efficiency measures and programs). In addition, in the 2021-2023 SRP Three-Year Plan, the Company will introduce efforts to address Non-Pipeline Alternatives for the first time by performing further background research on NPAs, exploring how NPAs align with Company policy and the LCP Standards, and building out the NPA program over the three years. Analysis from this process will be used by National Grid's energy efficiency team to determine if state-wide gas demand response offerings, separate from and additional to localized gas demand response projects within SRP, should be piloted in 2023 or beyond. National Grid's energy efficiency team will provide a summary of the results of analyses and/or pilots for state-wide gas demand response in the 2021-2023 year-end reports.

The Company continues coordination between SRP and customer offerings in the Energy Efficiency Plan to ensure that efforts, projects, and programs are optimal and not duplicated. As is the practice now and going forward, energy efficiency and demand response are examined during National Grid's distribution planning process as part of the development of NWA opportunities. This assessment of energy efficiency and demand response for NWAs occurs before the Company goes out to market with requests for proposals (RFPs) for solution bids from third-party solution providers. Energy efficiency or demand response may be deployed as part of an NWA solution so long as the targeted energy efficiency or demand response programs are least-cost, cost-effective, reliable, and technically feasible for the electric system need. The Company ensures cost-competitive utilization of targeted active DR by evaluating market prices and comparing third-party active demand response proposals to the incremental costs of targeted active DR which would build upon National Grid's existing ConnectedSolutions program.

Additionally, the Company also coordinates communications between the SRP Technical Working Group and the Energy Efficiency Technical Working Group, with members of each team participating in counterpart TWGs. The Company will also work with these groups and the PUC on changes in filing schedules to better align the SRP filing with the Infrastructure, Safety and Reliability (ISR) filing.

6.2 Heating Sector Transformation and National Grid's Northeast 80x50 Pathway

In an Executive Order issued on July 8, 2019, Governor Raimondo directed the Division of Public Utilities and Carriers (DPUC) and Office of Energy Resources (OER) to lead a Heating Sector Transformation (HST) with the goal of reducing emissions from the heating sector while ensuring Rhode Islanders have access to safe, reliable, and affordable heating. The HST recommendations were to be provided to the Governor by April 2020 and identify the energy, economic, and environmental opportunities and challenges posed by Rhode Island's heating sector in the face of a rapidly changing climate.[28]

The HST initiative resulted in an analysis conducted by the Brattle Group, on behalf of the DPUC and OER, outlining several solutions for decarbonizing the heating sector, described in the April 2020 report "Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050."[29] The report summarized opportunities in three broad categories relevant to the Company's efficiency planning: (1) reducing energy needs by improving building energy efficiency; (2) replacing current fossil heating fuels with carbon neutral renewable gas or oil; and (3) replacing current fossil-fueled boilers and furnaces with electric ground source or air source heat pumps powered by carbon-free electricity.

Additionally, in June 2018, the Company released the Northeast 80x50 Pathway[30] (Northeast Pathway) whitepaper that highlights National Grid's approach to reduce greenhouse gas emissions below 1990 levels while supporting economic growth, maintaining affordability, and providing customer choice. The Northeast Pathway and HST are aligned in several key areas related to energy efficiency, including the need to transform heating, in part, by increasing rates of efficiency retrofits and deep conversions of delivered-fuel heat to electric heat pumps.

Efforts in support of HST and the Northeast Pathway in this Three-Year Plan will include a continued focus on weatherization and building efficiency to prepare for efficient heating system replacement in the future. Going forward, the Company will continue to work with the state to analyze the steps needed to further the second two heating sector transformation objectives and the electrification transitions identified in the Company's Northeast Pathway analysis.

6.3 Heat Pump and Delivered Fuel Policy and Objectives

Per the PUC's ruling on the 2020 Annual Energy Efficiency Plan in Docket 4979, the Company may not offer incentives for electrification of heating for delivered fuel customers in 2020. The Company will not offer incentives for these measures in 2021 and will continue to pursue opportunities to engage, including supporting OER's efforts to advance the heat pump market and supporting weatherization for delivered fuel customers. The Company looks forward to working with stakeholders and policy makers

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[28] Executive Order 19-06, https://governor.ri.gov/documents/orders/Executive%20Order%2019-06.pdf
[29] Heating Sector Transformation in Rhode Island, Pathways to Decarbonization by 2050. http://www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%204-22-20.pdf
[30] National Grid's Northeast 80x50 Pathway, https://www.nationalgridus.com/News/Assets/80x50-White-Paper-FINAL.pdf

to identify the appropriate role and funding mechanisms for an electric utility to play in this transition and then executing on an approved pathway. In addition, pending availability of Regional Greenhouse Gas Initiative (RGGI) funds, the Company plans to combine our delivery pathways and standard air source heat pump (ASHP) incentives with RGGI-fund supported enhanced incentives for delivered fuel displacement in the near term until a more permanent mechanism to support these offerings is possible.

6.3.1 Heat Pump Implementation, and Education

The programs and strategies included in the Three-Year Plan will support the installation of heat pumps for heating and cooling for customers that utilize electric resistance heating. In an effort to further develop this market, the Company will continue to seek ways to educate consumers and installers on the associated cost savings from efficient heat pumps as compared to electric resistance heating. The Company will coordinate its efforts with state agencies to realize the opportunities related to heat pumps identified in the Heating Sector Transformation report and Company's Northeast Pathway study described in Section 6.2.

6.3.2 Delivered Fuels

The Company supports the state's objective to provide energy efficiency for delivered fuel customers and is working to serve these customers in multiple ways. Income eligible customers in single family and multifamily homes receive the same services as electric and gas customers, with no customer-incurred costs. The Company plans to continue these services over the next three years. For non-income eligible delivered fuel customers in single family (one- to-four-unit) and multifamily (five-plus unit) homes, the Company will continue to support weatherization, with financing available via the HEAT loan.

The Company will not offer additional energy efficiency surcharge funded incentives for customers to convert from delivered fuels to heat pumps per the aforementioned PUC ruling in Docket 4979; however, National Grid will continue to seek ways to support the state, including OER, in providing opportunities for delivered fuel customers to utilize efficient heat pumps for their heating needs. For example, the Company will coordinate with OER to support use of RGGI funding to offer enhanced heat pump installations for customers using those systems to displace the use of delivered fuels.

6.4 Power Sector Transformation

Governor Raimondo tasked the PUC, OER, and DPUC with developing a new regulatory framework for the state's electric system, which resulted in the Rhode Island Power Sector Transformation (PST) initiative in Dockets 4770 and 4780.[31] This initiative consists of four parallel work streams: 1) utility business model, 2) distribution system planning, 3) grid connectivity functionality, and 4) strategic electrification of transportation and heating. The Company will continue to incorporate outcomes of this initiative into the final Three-Year Plan and subsequent Annual Plans. This includes the Company's active demand response program, which will begin educating customers on real-time management of energy consumption to prepare them for future tools that may be available through grid modernization. These efficiency programs are planned in coordination with the Company's advanced metering functionality (AMF) and grid modernization efforts, discussed subsequently.

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[31] RI PUC Docket 4770: http://www.ripuc.ri.gov/eventsactions/docket/4770page.html
RI PUC Docket 4780: http://www.ripuc.ri.gov/eventsactions/docket/4780page.html

6.4.1 Advanced Metering Functionality and Grid Modernization

In addition to its energy efficiency planning, the Company also has teams actively working on grid modernization plans (GMP) and AMF. These three teams work closely to ensure the Company has a comprehensive view of the benefits and impacts of the roll out of grid modernization and AMF. These programs will provide increased visibility into customer usage (from AMF) and insights into the operation of the local distribution system (from grid modernization investments, including AMF). This will allow for improved efficiency program marketing, more personalized savings offers, more targeted measure deployment, and optimization of demand side resources. The Market Potential Study included scenario analysis that explored the impact of AMF and time-of-use rates on energy efficiency programs, specifically demand response programs.

The Company is in the process of initiating a GMP and AMF proceeding in Fall 2020. The Energy Efficiency team will continue to coordinate with the GMP and AMF teams to ensure that the Company has a comprehensive view of the benefits and impacts of the roll out of grid modernization and AMF. Specifically, the Company is working to ensure that the benefits estimated in the GMP and AMF Benefit Cost Analyses (BCA) would constitute a new baseline of savings upon which future energy efficiency goals are based and to ensure energy savings are not double counted. In addition to the calculation of benefits, the Company will also examine any possible overlap of costs.

If AMF is launched, the Company still anticipates energy efficiency programs would continue to offer customer incentives for in-home/in-business technologies, such as Wi-Fi programmable thermostats and smart appliances to drive the achievement of additional incremental energy savings to meet annual energy savings targets. The Company recognizes that the future energy efficiency plans would include the total participant costs (i.e., ratepayer-funded rebates and customer contribution costs) associated with such measures in its BCA methodology.

While the Energy Efficiency, GMP, and AMF teams have been coordinating closely through the filing process, the need to bifurcate savings and costs associated with these plans would not arise until grid modernization and AMF investments are approved, deployment begins, and data is collected and visualized for customers in later years. Therefore, the energy efficiency team anticipates that should the PUC approve AMF, the important overlap and distinction between GMP, AMF, and energy efficiency would most likely not arise until after (or, at a minimum, in the later years) of this Three-Year Plan. At that point the Company anticipates undertaking a more robust discussion of evaluation methodologies and other key considerations. In the interim, the Company will continue to work with the TWG to ensure all stakeholders are aware of any future transition.

6.5 Rate Cases

The Energy Efficiency program teams will continue to coordinate with the electric and gas businesses as they develop new rate cases during the term of the Three-Year Plan. For example, the Company currently earns a performance incentive for Annual MW Capacity Reduction from active electric demand response that was included in an electric rate case. In the future, the Company may revisit whether this performance incentive is more appropriate to include as part of annual energy efficiency programs rather than a rate case.

6.6 Integration with Renewables

As Rhode Island moves toward a clean energy future per Governor Raimondo and the General Assembly, National Grid will work to better integrate its energy solutions offerings. In addition to energy efficiency and demand response, this includes electric vehicles, renewable technologies, and battery storage. National Grid will work to create a seamless experience for the customer to select from these diverse solutions. As demonstration of these technologies and programs is necessary to determine effectiveness, benefits, and ease of use, this will require continued work to align Company funding for efficiency and the current renewables programs (net metering, and Renewable Energy Growth). Working with both internal and external stakeholders, the Company will identify new opportunities to enable the delivery of, and benefits from, integrated energy efficiency and renewable solutions.

6.7 Codes and Standards Program and Accounting for New Codes and Standards

Accelerating the state's adoption of, and compliance with, residential and commercial building energy codes helps ensure that energy efficiency is incorporated into buildings when it is least costly – at the time of construction or alteration. The Company has operated a Code Compliance Enhancement Initiative (CCEI) since 2013, one of the country's only utility programs of its kind. From 2019-2020, the Company also provided technical support to the state's energy code update process for the first time. Both code compliance and development support activities will continue in the next three years, with the latter scaling up to build upon the 2019-2020 demonstration.

As Rhode Island adopts more stringent energy codes and transforms the new construction market, the Company will continue to support the state's aggressive energy policies in promoting the next-generation building sector. The Company will continue to work with state and local building departments and OER to update and implement the state's residential and commercial stretch codes. The CCEI initiative will offer trainings and assistance related to promoting compliance with the stretch code as well as preparing the market for the zero-energy building future. The initiative will also investigate opportunities to support increased use of the stretch code.

The Company will also continue to work with OER, the Appliance Standards Awareness Project (ASAP), and Northeast Energy Efficiency Partnerships (NEEP) to provide technical support for the adoption of state-level appliance standards and investigate providing analogous support of federal appliance standards.

MULTI-YEAR STRATEGIES

7 Multi-Year Strategies

To some degree, all program strategies are multi-year strategies. Marketing investments in a particular year may be expected to drive customer awareness, engagement, and program participation in that year, but are also designed and intended to drive broader awareness of general programmatic offerings and benefits and reduce customer acquisition costs in future years. Similarly, workforce development efforts are intended to support near term vendor capacity expansion while also positioning the industry for longer term growth.

This being said, the Company has identified two specific program strategies that it believes warrant specific attention within the multi-year strategies section of this Three-Year Plan:

Combined Heat and Power (CHP) Projects: By their very nature, CHP projects require long sales cycles, have an unusual degree of implementation and other project uncertainties, and are frequently individually large enough that specific project risk cannot be managed through a portfolio approach. As such, the Company has proposed including best estimates of anticipated large projects within the illustrative annual savings goals and budgets included within Three-Year Plans, and refreshing these estimates within each Annual Plan as projects included with binding Annual Plan savings targets and budgets will, by definition, be more certain by the time of each year's Annual Plan submission.

Rhode Island Infrastructure Bank (RIIB) Transfers: Company support for RIIB and the Efficient Buildings Fund remains a policy priority of the Rhode Island state government and other key stakeholders. Temporal disconnects are likely between the time Company transfers to RIIB are budgeted and effectuated to support RIIB financing requirements, and the period in which those transfers will likely lead to claimable savings and benefits. This requires a multi-year approach to planning for and justifying these expenditures. To this end, the Company has included current expectations of anticipated multi-year savings linked to specific projects over the course of this Three-Year Plan associated with the requested 2021 RIIB transfer of $5 million in this section and anticipates supporting future requests in ensuing Annual Plan budgets.

This subsection further describes these areas and strategies and proposes a path forward for including funding and savings expectations associated with strategies in both illustrative Three-Year Plan goals and budgets, as well as binding Annual Plan goals and budgets.

7.1 Combined Heat and Power

Combined Heat and Power (CHP) projects involve long cultivation, planning and design timelines, and complex approval processes. CHP projects are a cost-effective way to reduce operating costs, increase resiliency, and decrease greenhouse gas emissions. Historically, the CHP program has resulted in significant energy savings to Rhode Island customers. Key to this success is National Grid's go-to-market strategy that includes a CHP manager, sales and technical staff, and technical vendors, all of whom play a role in identifying opportunities and delivering projects. In order to realize additional CHP savings, National Grid will focus its outreach on customer segments that have been identified as suitable

candidates for CHP, such as large industrial facilities that have sufficient and coincident thermal and electric loads, large multifamily units that have significant and steady thermal loads, and wastewater treatment facilities or agricultural operations that can leverage opportunity fuels. Additionally, the Company will look to increase the number of smaller CHP units, and target facilities and places of business that can leverage opportunity fuels or renewable natural gas (e.g. methane from a landfill) as a primary or secondary fuel source.

CHP projects also present challenges from an implementation perspective. These projects involve substantial capital investments, complex technical requirements for installation, and long time horizons for interconnection. Taken as a whole, the lead times for CHP projects can range from 12-36 months from the initial scoping until before the equipment is installed and interconnection is complete (and therefore full savings can be claimed by the Company). Additionally, incremental regulatory requirements associated with the approval and payment of the significant incentives typically associated with larger CHP projects introduces a level of timing and completion uncertainty that is uncommon in other areas of the Company's energy efficiency portfolio. These complexities introduce challenges in predicting the specific year in a forward looking, multi-year plan in which savings will be realized within a year. Additionally, given the large size and associated savings of many individual CHP projects, a delay in any one project could lead to a loss of planned savings that is unlikely to be made up for with other, non-CHP projects. For example, a large CHP project may account for as many as 345,000 net Lifetime MWh of anticipated savings (representing 20%-30% of the C&I sector anticipated savings in any given year), at an average cost of $300 per MWh. If the project is delayed, there is little chance that other projects can be completed in time to make up for the anticipated 345,000 Lifetime MWh in savings (or associated cost) within an annual plan year if those projects were not already in development.

In order to provide incremental transparency and visibility into the state of the CHP project pipeline, the Company proposes a two-fold approach to CHP project planning:

- Forecasts, including those in Table 17 below, within each three-year plan of specific, large CHP projects that the Company believes have a reasonable likelihood of moving forward within the plan term. Anticipated savings and incentives spend associated with these projects are also included in the illustrative annual savings goals and budgets embedded in each three-year plan.
- Inclusion of expected savings and benefits, and the specific budget required to realize those outcomes, within each annual plan's binding savings and budget targets for those projects the Company anticipates will achieve milestones necessary to claim savings and associated benefits within the term of that annual plan.

National Grid will only include CHP projects in each annual plan's savings target and budgets that the Company believes have a good likelihood of achieving completion milestones necessary to claim savings within that annual plan's calendar year. Typically, this means that the customer has placed an order for CHP equipment and is expecting the equipment to be installed within the calendar year. For planning purposes, this will help to ensure the energy savings targets can be achieved within the calendar year, and that budgeted incentives costs will be utilized in the year in which they are planned for (and collected from customers).

For CHP projects, a maximum of 80% of the energy efficiency incentive payment and project savings are withheld until after the project has been interconnected and post-inspected. A minimum of 20% of the energy efficiency incentive payment and project savings are withheld until the project has been commissioned. Depending on the post-inspection date and project complexity, the energy efficiency incentive payments and project savings can span multiple years.

Table 17 includes the initial budget estimates and preliminary anticipated savings values for the CHP projects included in the illustrative savings and budget goals in this Three-Year Plan that are expected to span multiple years. The three projects listed below are currently in different design stages and therefore have different levels of risk and uncertainty. Of the three projects, only the 600 kW CHP has completed a full technical assistance study. The 13,200 kW and 7,800 kW projects are currently in the initial scoping phase and may be subject to design modifications that could impact the savings estimates and incentive payments. Additionally, the 13,200 kW and 7,800 kW projects may encounter interconnection, engineering, or implementation challenges that could prevent or delay the installation of the CHP projects.

Table 17. Initial Budget Estimates and Anticipated Savings for Multi-Year CHP Projects

CHP Nameplate Capacity	2021			2022		
	Gross Annual Savings (kWh)	Gross Lifetime Savings (kWh)	Incentive Payment	Gross Annual Savings (kWh)	Gross Lifetime Savings (kWh)	Incentive Payment
600 kW	2,188,000	43,760,000	$513,000	548,000	10,960,000	$120,000
13,200 kW				21,172,232	423,444,640	$10,522,918
7,800 kW						
Total	2,188,000	43,760,000	$513,000	21,720,232	434,404,640	$10,642,918

CHP Nameplate Capacity	2023		
	Gross Annual Savings (kWh)	Gross Lifetime Savings (kWh)	Incentive Payment
600 kW			
13,200 kW	5,293,058	105,861,160	$2,762,140
7,800 kW	27,499,648	549,992,960	$5,600,000
Total	32,792,706	655,854,120	$8,362,140

7.2 Rhode Island Infrastructure Bank (RIIB)

The Efficient Buildings Fund (EBF) provides attractive, long-term financing to municipalities and quasi-public agencies for the completion of energy efficiency. EBF seeks to finance energy retrofits in public buildings that will result in electric and heating savings greater than 20% across all properties receiving improvements. To date, the Infrastructure Bank has made $20.5 million in loans through the Efficient Buildings Fund resulting in savings of 5,551 net annual MWh (76,578 lifetime MWh) and 56,092 net

annual therms (390,592 lifetime therms). More than 85% of the claimed electric savings generated since inception come from streetlighting projects.

Eligible properties include municipal buildings, schools, publicly-owned utilities, such as wastewater or drinking water facilities, and quasi-state entities. Financing can be repaid over terms of up to 15 years and can be structured to provide annual cash-flow savings to the borrower. The Rhode Island Office of Energy Resources is the Bank's regulatory partner for the program. For a project to be eligible for financing, it must first be placed on OER's Project Priority List (PPL). OER ranks and scores project applications based on transparent scoring criteria, which results in the production of a PPL at least once annually. More details can be found in the 2021 Annual Plan, Attachment 2.

In addition to planned annual transfers to RIIB, the Company has included potential savings and incentives in this Plan that are anticipated to be associated with projects financed through EBF (see Table 19, Table 20, Table 21, and Table 22). These savings are based on a pipeline provided by RIIB to the Company during the preparation of the 2021 Annual Plan (see Table 18), which shows a potential for 11,700 gross MWh. Although the Construction Estimates show 2021-2022 for most projects/loans, the Company believes it is most appropriate to spread out the savings across the three-year period, given the inherent uncertainties associated with the implementation timing of these projects. The process of working with municipalities frequently encounters decision making and funding issues that may delay parts of the process. In addition, the Company cannot claim savings until projects are paid and post inspected, which may lead to substantial project completion in one year, though claimed savings are not realized until the following year.

For Annual Plan savings targets and budgeting purposes, National Grid has estimated that 1,000 gross MWh will be completed and claimable in 2021. The remaining 10,700 MWh of estimated gross savings were 75% allocated to 2022 and 25% to 2023. A similar process was followed for estimating and allocating gas savings. In both cases, although the savings estimates are spread over multiple years, RIIB has indicated their expectation that many of these municipalities will commit to borrow money in 2021.

The Company has included a transfer of $5,000,000 to RIIB in the 2021 budget tables for both this Three-Year Plan and the 2021 Annual Plan. The Company has also included placeholder anticipated annual transfers of $5,000,000 in the illustrative Three-Year Plan budgets for 2022 and 2023 based on expressions of anticipated need by RIIB.

Table 18. Potential Savings Associated with Projects Financed through EBF

Project	Estimated Loan Amount	Like-lihood Weigh-ing Factor	Weighted Financing Estimate	Construction Estimates	Savings Estimate - MWh annual	Savings Estimate - therms annual	Savings Estimate - MWh lifetime	Savings Estimate - therms lifetime
1	$4,000,000	0.75	$3,000,000	2021-2022	1,600	-	24,000	-
2	$2,500,000	0.75	$1,875,000	2021-2022	867	16,667	13,000	250,000
3	$5,000,000	0.75	$3,750,000	2021	1,733	33,333	26,000	500,000

4	$5,000,000	0.75	$3,000,000	2021-2022	1,400	26,667	21,000	400,000
5	$15,000,000	0.75	$11,250,000	2021-2022	5,267	100,000	79,000	1,500,000
6	$2,000,000	0.50	$1,000,000	2021-2022	733	13,333	11,000	200,000
Total	**$33,500,000**		**$23,875,000**		**11,700**	**190,000**	**174,000**	**2,850,000**

Table 19. Estimated Electric Savings from EBF-funded Projects 2021-2023 (net kWh)

	2021 Annual	**2021 Lifetime**	**2022 Annual**	**2022 Lifetime**	**2023 Annual**	**2023 Lifetime**
New Construction	313,587	4,703,809	2,448,904	41,841,431	932,501	15,932,502
Retrofit	306,726	6,134,520	3,040,373	39,136,372	924,130	10,230,621
Total	**620,313**	**10,838,329**	**5,489,277**	**80,977,803**	**1,856,631**	**26,163,123**

Table 20. Estimated Electric Incentives Associated with EBF-funded Projects 2021-2023

	2021	**2022**	**2023**
New Construction	$190,000	$1,040,578	$396,234
Retrofit	$105,000	$1,465,719	$478,156
Total	**$295,000**	**$2,506,297**	**$874,391**

Table 21. Estimated Gas Savings from EBF-funded Projects 2021-2023 (net MMBtu)

	2021 Annual	**2021 Lifetime**	**2022 Annual**	**2022 Lifetime**	**2023 Annual**	**2023 Lifetime**
New Construction	242	4,122	1,086	20,187	1,330	24,337
Retrofit	2,884	26,878	9,192	88,772	5,526	59,789
Total	**3,126**	**31,000**	**10,278**	**108,959**	**6,856**	**84,127**

Table 22. Estimated Gas Incentives Associated with EBF-funded Projects 2021-2023

	2021	**2022**	**2023**
New Construction	$7,625	$56,993	$64,660
Retrofit	$52,148	$167,250	$102,984
Total	**$59,773**	**$224,242**	**$167,643**

CONSISTENCY WITH STANDARDS

8 Least-Cost Procurement Law and Standards

Rhode Island's Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006 (Act) provides the statutory basis for Least-Cost Procurement of energy efficiency and conservation resources and system reliability in Rhode Island. Energy efficiency procurement includes "energy efficiency and energy conservation measures that are prudent and reliable and when such measures are lower cost than acquisition of additional supply, including supply for periods of high demand."[32] System reliability procurement includes, but is not limited to, renewable energy resources, distributed generation, targeted energy efficiency, direct load control, and demand response. These are the two main areas that National Grid is authorized to work on under the Act. The Act requires the Company submit plans for energy efficiency and conservation, and system reliability procurement to the PUC on a triennial basis.[33] Such plans must include "measurable goals and target percentages for each energy resource, pursuant to standards established by the Commission, including efficiency, distributed generation, demand response, combined heat and power, and renewables."[34]

Figure 3. Relationship Between the Statutory Basis for Least-Cost Procurement Standards and the Company's Procurement Plans

[32] R.I. Gen. Laws § 39-1-27.7.
[33] R.I. Gen. Laws § 39-1-27.7.
[34] R.I. Gen. Laws § 39-1-27.7.

8.1 Prudency

Over the course of its history implementing energy efficiency programs in Rhode Island, the Company has considered and continues to consider several key components in the analysis of prudency. These components can be summarized as considerations of:

- How the investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement and what the potential for synergy savings may be based on alternatives that address multiple needs.
- What groups of customers can the Company reach with program offerings? How can we ensure that all customers are served equitably and share in the cost of energy efficiency?
- What impacts to customer rates and bills will be required to deliver the efficiency goals, and how can those impacts be mitigated through alternative funding? What risks, if any, will customers and the Company see from the investments in energy efficiency and conservation procurements?
- What constraints, such as available workforce and prevailing economic conditions, exist in the marketplace that may impact the achievement of the goals as developed and proposed in the Plan?

For the proposed investments detailed in this Plan, the Company has assessed each of these elements and how they can be balanced to provide a comprehensive set of programs that will be achievable within known and anticipated constraints.

8.1.1 General Considerations of Prudency

One of the very first considerations of prudency within the Standards is that the Company assess how an investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement. This Plan secures cost effective energy efficiency resources that drive the realization of benefits as enumerated in the Rhode Island Test including Electric Energy Benefits, Electric Generation Capacity Benefits, Electric Transmission Capacity and Distribution Capacity Benefits, Natural Gas Benefits, Fuel Benefits, Water and Sewer Benefits, Non-Energy impacts, Price Effects, Non-embedded Greenhouse Gas Reduction Benefits, Economic Development Benefits, Non-embedded NOx Reduction Benefits, and Value of Improved Reliability.

As an example of the way that the proposed investments in this plan address multiple needs, the electric demand response program continues to grow in magnitude of savings and in offerings while utilizing channels and technologies that drive not only energy savings but also reduced cost and deferred infrastructure benefits that flow from reducing peak demand.

In aggregate the portfolios included in this Three-Year Plan submission are robustly cost effective, as the benefits exceed the costs to acquire the efficiency resources and implement the programs. The electric portfolio achieves a BC Ratio range of 4.14 – 4.19 and the gas portfolio achieves a BC Ratio range of 3.03 – 3.04.

Furthermore, the cost of procuring 4,678,382 – 4,905,459 lifetime MWh (electric) Plan is $347,367,903 - $364,578,538 less than if that electric load was met by purchasing additional electric supply. The cost of procuring 14,468,336 – 16,553,713 lifetime MMBtu (gas) is $53,718,499 - $62,328,085 less than if that natural gas load was met by purchasing additional natural gas supply.[35]

8.1.2 Equity

This Three-Year Plan is designed to ensure equity across residential programs. In the context of energy efficiency, this means programs serve all customer segments, the energy efficiency rate has parity, and energy efficiency services provide assistance to the most vulnerable customers who may pay a higher proportion of their income towards energy costs.

National Grid remains committed to ensuring that the distribution of energy efficiency funding is equitable across income and geographic sectors. The Company intends to continue to identify groups and geographic areas with historically low participation. Over the course of the coming three years, the Company will work with the Office of Energy Resources to engage stakeholders through an equity working group to identify areas of importance and focus. At this point, OER and National Grid envision the working group to be comprised of representatives from OER, other state agencies, National Grid, community-based organizations, advocacy organizations, and local subject matter experts in equity. The working group will be a key resource for the Company as it develops future annual plans and further studies equity through a number of evaluation efforts.

Next, the Company will initiate several studies to better understand historic customer participation and the extent to which geography, income, homeownership status, and primary language may be different among participants and non-participants. The Company's first step towards doing so will be to undertake a residential non-participant study to understand the attributes of non-participants and why they are not participating. This study is to be commissioned in early 2021, with anticipated completion in mid-2022, and will build on lessons learned from recently-completed Massachusetts non-participant studies. Secondly, the Company commits to undertake a census of multifamily housing to understand multifamily participation and non-participation. Thirdly, National Grid will track and report to stakeholders on renter participation in the in-home/unit assessment programs, and other programs as determined appropriate. The Company also proposes to use data from the proposed evaluations to build program enhancements and tracking systems that are driven primarily by the needs of identified non- or low-participating groups, as well as additional marketing efforts better tailored to multilingual customers.

In addition, the Company acknowledges the critical role that income plays in access to energy efficiency programs and proposes further immediate action in 2021 to enhance income eligible customer participation that may be found at Sec. 8 of the 2021 Annual Plan and within Attachment 1.

8.1.3 Rate and Bill Impacts

Investment in energy efficiency is funded by a surcharge on customers' bills. Energy efficiency investments can impact rates and customer bills through avoided energy usage, price suppression, and avoided infrastructure investments, the increased cost of the surcharge, and revenue recovery. These

[35] These ranges represent the 3YP Base Case – 3YP High Scenario.

components can have upward and downward effects on rates and bills. in annual plans and the present Three-Year Plan, the Company has assessed the impact of the proposed energy efficiency investments through analyses that assess the long term rate and bill impacts of the proposed portfolios, pursuant to the Standards. These analyses are one element of the set of quantitative data points that the Company considered in developing these portfolios, in conjunction with the benefit cost analysis and the cost of supply analysis.

For several years, National Grid has analyzed the rate and bill impacts of the electric portfolio using a model that assesses the long term impacts to rates due to the presence of the annual energy efficiency portfolio in contrast to a counterfactual where the energy efficiency programs, and their corresponding upfront costs and savings over the duration of the measures' lives did not exist.

In 2020, National Grid, in collaboration and consultation with the EERMC, OER, and the DPUC, undertook an effort to revise the rate and bill impact analysis for the gas portfolio to more closely align the modeling approach between the electric and gas portfolios. Synapse Energy Economics, who originally developed the electric bill and rate impacts model, was retained to develop the natural gas rate and bill impact model that is first applied in this plan. The new gas rate and bill impact model is closely aligned with the existing electric model in that it shows the change in long term rates and bills due to the presence of the energy efficiency programs in contrast to a counterfactual where the energy efficiency programs were not in place. While the methods are largely aligned between the electric and natural gas portfolios, there are key differences between the analyses, including the presence of avoided costs for transmission and distribution in the electric models.

Additional detail on the methods and results from both models are provided in Attachment 7, Rate & Bill Impacts of the 2021 Annual Energy Efficiency Plan. In addition, summary results are presented below for the electric and natural gas portfolios included in this Three-Year Plan.

8.1.3.1 Electric Rate and Bill Impact Results

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 models analyze two cases: the fulfillment of the each of the years of the 3 Year Plan and the absence of an efficiency plan in each of those years. This comparison isolates the effects of the each years' proposed EE program charge and Fully Reconciling Funding Mechanism. These assume energy efficiency plans have been implemented before 2021 but will not be offered starting in 2021. The analysis also incorporates how system-wide reduction in energy consumption affects the different elements of rates such as transmission, distribution, and commodity charges.

Five separate electric models were developed, one for each of the main customer segments: Residential, Income Eligible, Small Commercial, Medium Commercial, and Large Commercial and Industrial. Table 23

table below shows the mapping of efficiency programs to rate classes for the five models.[36] The diversity of the commercial customer profile means that customers from multiple rate classes can participate in any commercial program. Assumptions for these rate classes were made based on historical program participation data.[37]

Table 23. Mapping of Efficiency Programs to Rate Classes

Electric Bill Impact Model	Rate Class(es)
Residential Electric	A-16
Income Eligible Electric	A-60
Small Commercial	C-06
Medium Commercial	G-02
Large Commercial	G-32, G-62

The results of the models are shown in the tables below. The columns in the Tables are as follows:

- Long-term rate impacts are defined as the average rate increase percentage from over the following 20 years (positive numbers indicate rate increase).
- Long Term Average Change in Bills is defined as average percentage of bill decrease to total customer bill over the next 20 years (negative numbers indicate electricity bill reduction).

The long-term rate impacts, and long term average change in bills are shown for average participants in energy efficiency programs, non-participants, and average customers within each of the five main customer segments. Average customers combine the bill impacts of EE participants and non EE participants to show the impacts of all customers combined.

See Attachment 7 of the 2021 Annual Plan for additional details on bill impacts methodology.

Table 24. 2021 Electric Rate and Bill Impacts

Sector	Long Term Rate Impacts	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.41%	0.41%	-0.42%	-0.42%
Income Eligible	1.23%	1.23%	-2.46%	-2.54%
Small C&I	0.37%	0.37%	-0.81%	-8.88%
Medium C&I	0.03%	0.03%	-1.66%	-9.02%
Large C&I	-0.16%	-0.16%	-2.72%	-4.44%

[36] Delivery service rate tariffs is R.I.P.U.C. Tariff No. 2095 for rates A-16 (basic residential rate), A-60 (low-income residential rate), C-06 (small C&I rate), G-02 (medium C&I rate), G-32 (large C&I rate). Standard Offer Service rates used in the analysis are R.I.P.U.C. No. 2096 and R.I.P.U.C. No. 4809 A-16 & A-60 total commodity charge for standard and low income residential rate group, C-06 total commodity charge for small C&I rate group, G-02 total commodity charge for medium C&I rate group and G-32 total commodity charge for large C&I rate group.

[37] Savings and participation modeled by C&I rate classes is partitioned and estimated based on historical data.

Table 25. 2022 Illustrative Base Case Electric Rate and Bill Impacts

Sector	Long Term Rate Impacts	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.60%	0.60%	0.06%	-0.03%
Income Eligible	1.22%	1.22%	-1.48%	-1.63%
Small C&I	0.65%	0.65%	-0.70%	-8.81%
Medium C&I	0.40%	0.40%	-1.60%	-8.92%
Large C&I	0.31%	0.31%	-2.58%	-4.23%

Table 26. 2022 Illustrative High Scenario Electric Rate and Bill Impacts

Sector	Long Term Rate Impacts	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.66%	0.66%	-0.03%	-0.14%
Income Eligible	1.28%	1.28%	-1.52%	-1.63%
Small C&I	0.69%	0.69%	-0.72%	-8.73%
Medium C&I	0.43%	0.43%	-1.65%	-8.84%
Large C&I	0.34%	0.34%	-2.67%	-4.18%

Table 27. 2023 Illustrative Base Case Electric Rate and Bill Impacts

Sector	Long Term Rate Impacts	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.74%	0.74%	0.03%	-0.06%
Income Eligible	1.42%	1.42%	-1.37%	-1.48%
Small C&I	0.81%	0.81%	-0.68%	-10.69%
Medium C&I	0.56%	0.56%	-1.67%	-10.95%
Large C&I	0.51%	0.51%	-2.60%	-4.83%

Table 28. 2023 Illustrative High Scenario Electric Rate and Bill Impacts

Sector	Long Term Rate Impacts	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.84%	0.84%	0.09%	0.02%
Income Eligible	1.57%	1.57%	-1.47%	-1.53%
Small C&I	0.91%	0.91%	-0.72%	-10.44%
Medium C&I	0.64%	0.64%	-1.80%	-10.71%
Large C&I	0.59%	0.59%	-2.83%	-4.68%

8.1.3.2 Natural Gas Rate and Bill Impact Results

As noted above, the Natural gas programs are projected to generate slight upward movement in average long term rates between 0.0% and 1.0% depending on the sector, year, and scenario (base case or high scenario). For the income eligible customer participants, the Small C&I participants, and Large C&I participants, modeling shows a reduction in bills between 1.16% and 7.12%, again depending on year, sector, and scenario (base case or high scenario)

With respect to the residential sector, the Company used three distinct model instances to explore the rate and bill impacts for this customer sector in each year and scenario (base case or high scenario). The three residential model instances explored 1) the Home Energy Report (HER) program in isolation, 2) the EnergyWise, EnergyStar HVAC, Multifamily, Residential New Construction together (excluding HER program), and 3) All five programs together. It is important to note that each of these three parts of the residential sector analysis has been developed using a separate instance of the gas rate and bill impacts model. Attachment 7 to the 2021 Annual Plan provides additional detail on the modeling approach for this sector.

Relative to the other four residential programs, The HER program has a short measure life (1 year), while reaching the significant majority of residential customers. The period of time covered by the analysis is determined by the average measure life of the longest included program. Consequently, the model instance analyzing the HER program in isolation covers a much shorter period of time than the other two model instances, which means that the three instances are not directly comparable, and the first two model instances do not additively result in the third instance.

For example, in the 2021 results, when the HER program is considered in isolation (Residential Model 1), average participants see a reduction in bills of on average 0.01%. When all other residential programs are considered together (Residential Model 2), the model shows average participants see a 5.29% reduction in average bills. Lastly, when all residential programs are considered together (Residential Model 3), the modeling shows the long-term average change in bills is very slightly positive (0.03%). As discussed in more detail in Section 4.3 of Attachment 7 to the 2021 Annual Plan, this result is largely a byproduct of the modeling approach that combines the short-lived HER program with other longer-lived measures.

Table 29. 2021 Natural Gas Rate and Bill Impacts

Sector	Average change in rates due to 2021 Base Case Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.4%	0.41%	0.15%	-5.29%
Residential (Model 3: All Programs)	0.4%	0.43%	0.15%	0.03%
Income Eligible	0.7%	0.75%	-0.16%	-4.48%
Small C&I	0.3%	0.25%	0.19%	-7.12%
Large C&I	0.4%	0.41%	0.00%	-1.16%

Table 30. 2022 Illustrative Base Case Natural Gas Rate and Bill Impacts

Sector	Average change in rates due to 2022 Base Case Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.5%	0.49%	0.20%	-5.36%
Residential (Model 3: All Programs)	0.5%	0.51%	0.20%	0.06%
Income Eligible	0.8%	0.83%	-0.09%	-4.48%
Small C&I	0.3%	0.32%	0.21%	-7.07%
Large C&I	0.5%	0.49%	0.06%	-2.48%

Table 31. 2022 Illustrative High Scenario Natural Gas Rate and Bill Impacts

Sector	Average change in rates due to 2022 High Scenario Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.5%	0.51%	0.18%	-5.34%
Residential (Model 3: All Programs)	0.5%	0.52%	0.17%	0.02%
Income Eligible	0.9%	0.89%	-0.17%	-4.42%
Small C&I	0.3%	0.32%	0.20%	-7.06%
Large C&I	0.5%	0.29%	0.00%	-2.48%

Table 32. 2023 Illustrative Base Case Natural Gas Rate and Bill Impacts

Sector	Average change in rates due to 2023 Base Case Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.6%	0.56%	0.22%	-5.60%
Residential (Model 3: All Programs)	0.6%	0.58%	0.22%	0.05%
Income Eligible	0.9%	0.89%	-0.05%	-4.50%
Small C&I	0.4%	0.37%	0.22%	-7.03%
Large C&I	0.6%	0.56%	0.00%	-3.22%

Table 33. 2023 Illustrative High Scenario Natural Gas Rate and Bill Impacts

Sector	Average change in rates due to 2023 High Scenario Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.01%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.6%	0.60%	0.17%	-5.57%
Residential (Model 3: All Programs)	0.6%	0.61%	0.16%	-0.03%
Income Eligible	1.0%	1.00%	-0.17%	-4.40%
Small C&I	0.4%	0.38%	0.19%	-7.02%
Large C&I	0.6%	0.58%	-0.12%	-3.20%

8.2 Reliability

The programs developed under this Three-Year Plan will continue the Company's extensive history of offering best-in-class energy efficiency programs to customers, while introducing new implementation approaches and expanding the Company's existing programs to serve more customers. Existing programs that have significant experience and traction in the market will be extended and refined to deploy low-risk cost-effective energy efficiency to the marketplace. The Company continues to collaborate with a diverse set of stakeholders including the EERMC, OER, Division, and community and advocacy organizations to continually analyze the programs and identify opportunities for improvement.

In building this Three-Year Plan, the Company's Customer Energy Management team worked closely with industry experts, vendors, and program implementation professionals to assess the current state of existing programs, the potential for program scalability, the economic environment, and the ability to deliver reliable energy savings as a result. By speaking with on-the-ground implementers and engaging in discussions on regional and national best practices in the face of the COVID-19 pandemic, the Company positions the programs for success in what is a generally uncertain time.

Supporting the Company's efforts to deploy energy efficiency to Rhode Island customers is a robust and long-standing evaluation, measurement, and verification (EM&V) apparatus. As noted in Section 5, the Company hires independent third-party consulting firms to regularly conduct evaluation studies as part of its EM&V process. A distinct group of personnel within National Grid that includes analysts with specialized skills in engineering, statistics, and economics are tasked with the EM&V function and coordinate all elements of the EM&V process internally and externally. Evaluations incorporate industry standard methods to assess the actual energy and demand savings of measures incented by the programs. All elements of the EM&V process are closely monitored by the EERMC, their Consultants, and OER. The EM&V process is continual, and every year results from EM&V studies are used to update the savings in the benefit cost calculation of the measure, programs, and portfolios. In addition, process evaluations and market studies conducted in the EM&V process provide an independent perspective on the performance of the programs and provide insight into the state of the market and ways that the Company can address new opportunities with its programs.

In total, these EM&V processes provide a transparent, externally vetted approach to ensuring that claimed savings provide an accurate picture as possible of the impact of the Company's energy efficiency programs, accounting for spillover, free ridership, and other industry standard adjustment factors

The EM&V process also supports the Company's participation in the ISO-NE Forward Capacity Market (FCM). Passive demand savings achieved via electric energy efficiency and Combined Heat and Power projects, and verified by the EM&V process, continue to participate in the FCM as Passive On-Peak Demand Resources. As detailed further in Section 10, the Company bids the passive demand savings attributed to energy efficiency measures and Combined Heat and Power facilities in the FCM and manages the associated capacity resources to maximize the resulting FCM revenue. The EM&V process provides the necessary verification of claimed savings in order to participate in the FCM.

Additionally, the Company anticipates that the 2021 Annual Plan will be the last year in which a residential efficiency lighting program will be offered. Due to the Company's successful efforts to transform the lighting market through its efficiency programs, the opportunities for cost-effective claimable lighting savings are anticipated to be exhausted by the end of 2021. In this time of transition, the Company will continually evaluate ways that other existing programs can be enhanced to generate savings that in the past were accomplished through relatively simple lighting measures. Increased complexity of measures will require new approaches to maintain the same levels of reliability of goals and savings in future plans.

8.3 Environmentally Responsible

The energy efficiency programs and portfolios described in the Three-Year Plan are environmentally responsible. They provide significant emissions reductions benefits, reduce the potential environmental costs and footprint of avoided infrastructure investments, support the ongoing growth and development of a sustainable, green job ecosystem in Rhode Island, and contribute to the realization of state environmental policy goals and initiatives.

8.3.1 Emissions Reductions

Both electric and natural gas efficiency portfolios will make a meaningful contribution to reduction in emissions by driving reductions in customer energy usage in both the short and long term. The electric and natural gas portfolios, considered together, will reduce lifetime emissions of between 2.85 and 3.09 Million tons of Carbon Dioxide. The non-embedded values of CO_2 benefits generated by the 2021-2023 plans over the lifetime of the measures range from $169.8 million – $184.7 million. The non-embedded values of NO_x range from $12.4 million – $14.0 million

8.3.2 Support for an Environmentally Responsible Local Jobs Infrastructure

In 2019, the Company's Energy Efficiency programs directly supported 877 FTEs. In providing for these jobs and demonstrating the availability and attractiveness of local, green jobs to Rhode Island's existing and emerging workforce, the Company's energy efficiency programs help to ensure that the local workforce will exist to support the state's environmental policy goals.

8.3.3 Raised customer awareness of environmental issues and the impacts of their choices

Educating and engaging residential and business customers on the potential environmental impacts and benefits of the implementation of energy efficiency measures is a foundational element of the Company's energy efficiency go-to-market strategy. Whether in the form of conveying potential environmental benefits of customer recommendations through Home Energy Reports, Energy*Wise* home energy assessments, or retail marketing initiatives, or by connecting SMB audits or large C&I customer sales efforts to business customer sustainability initiatives, the Company's energy efficiency program presence will continue to help to support the prominence of environmental issues in customers' minds. Additionally, through the Community-Based Initiative, the Company partners with municipalities and works through local energy and environmental sustainability committees to connect individual customers' energy efficiency decisions and actions to broader municipal sustainability goals and messages. In doing so, the Company's programs continue to link energy savings and efficiency to real and visible benefits for the communities in which their residents and small business reside.

8.4 Cost Effectiveness

The Company has determined the proposed investments in this Three-Year Plan to be cost effective using the RI Test. In addition to cost-effectiveness per the RI Test as required by the Standards, the Company also presents and compares the results of the TRC test to enable comparison with past plans. The RI Test is a robust societal test that attempts to incorporate all costs and benefits associated with energy related investment before the PUC.

8.4.1 RI Test

In accordance with the revised Least-Cost Procurement Standards (see Section 8), the Company has evaluated the cost-effectiveness of the proposed investments in this Three-Year Plan using the Rhode Island Benefit Cost Test (RI Test). The RI Test was refined to comply with the Docket 4600 Benefit-Cost Framework, which defines how utility ratepayer investments should be assessed in Rhode Island, and has been in use since 2018. Prior to the PUC's completion of the Docket 4600 Benefit-Cost Framework, the Least Cost Procurement Standards issued triennially defined the categories of benefits and costs to be included in the RI Test.

The shift to using the RI Test has been a positive development for energy efficiency. The RI Test more fully reflects the policy objectives of the state with regard to energy, its costs, benefits, and environmental and societal impacts. Accounting for all costs and benefits associated with energy efficiency provides a more robust accounting of the societal benefits that energy efficiency programs deliver to electric and gas customers, the state, and society.

The cost-effectiveness analyses of the proposed programs use avoided energy supply costs developed by Synapse Energy Economics as part of the "Avoided Energy Supply Components in New England: 2018 Report" (2018 AESC Study), sponsored by New England's electric and gas efficiency program

administrators.[38][39] The avoided costs reflect current and expected market conditions and are highly influenced by the cost of fossil fuels and expectations about ISO-New England's forward capacity market. Company-specific transmission and distribution capacity values are also included. The cost-effectiveness analyses also includes estimates of the economic benefits of energy efficiency. These benefits are calculated by a set of macroeconomic multipliers for the economic benefits of investing in cost-effective energy efficiency were also updated from a recent study "Review of RI Test and Proposed Methodology" prepared for National Grid by the Brattle Group, January 31, 2019.

Prior to 2018, the Company assessed the cost-effectiveness of measures, programs, and portfolios in its Three-Year and Annual Plans according to the Total Resource Cost Test (TRC Test). The TRC includes a narrower set of benefits than the Rhode Island test. The TRC does not include carbon or economic benefits that are included in the RI Test. The TRC includes the same set of costs as the RI Test. The equations below indicate the general categories of benefits and costs that are included in each of the tests.

Equation 1. RI Test Specification

$$RI\ Test\ B/C\ Test = (Energy + Capacity + Resource\ Benefits + Economic\ Benefits + Carbon\ Benefits)\ /\ (Program\ Implementation + Customer\ Contribution + Performance\ Incentive)$$

Equation 2. Total Resource Cost (TRC) Test Specification

$$TRC\ B/C\ Test = (Energy + Capacity + Resource\ Benefits)\ /\ (Program\ Implementation + Customer\ Contribution + Performance\ Incentive)$$

Refer to Three-Year Plan Attachment 2. Program Level Benefit Cost Summary for the RI Test results for each program in each year of the Plan.

8.4.2 Comparison of TRC Test to RI Test

In accordance with Section 1.2(B)(vi) of the Standards as approved in Docket 4684, and in effect for this Three-Year Plan, the Company continues to provide the benefits and cost-effectiveness ratios using the TRC Test and the RI Test in Three-Year Plan Attachment 1. Energy Efficiency Funding Plans. Table 34 compares the categories of benefits and cost in the TRC and RI Test.

[38] Synapse Energy Economics, Avoided Energy Supply Components in New England: 2018 Report, Amended October 24, 2018.

[39] The Company is currently participating in the next iteration of the AESC Study, scheduled to produce a new set of avoided costs for use in screening energy efficiency portfolios in early 2021. If new avoided cost categories are developed through this new study, they will be considered for inclusion in this study. Further, if other benefit or cost categories can be quantified and monetized prior to the 2022 Annual Plan filing they will be included in the screening of the RI Test.

Table 34. Comparison of Benefit and Cost Categories in the TRC and RI Test

	TRC Test	RI Test
Energy Efficiency Program Benefits		
Avoided Energy Costs	Yes	Yes
Avoided Capacity Costs	Yes	Yes
Avoided Transmission and Distribution Costs	Yes	Yes
Avoided Natural Gas Costs	Yes	Yes
Avoided Delivered Fuel Costs	Yes	Yes
Demand-Reduction-Induced Price Effects (DRIPE)	Yes	Yes
Water and Sewer Benefits	Yes*	Yes
Non-Energy Impacts	Yes**	Yes
Avoided cost of Environmental Compliance	Yes	Yes
Non-embedded Greenhouse Gas Reduction Benefits	No	Yes
Non-embedded Nitrous Oxide (NOx) Benefits	No	Yes
Economic Development Benefits	Only for CHP	Yes
Reliability Benefits	No	Yes
Other emissions generated or reduced through LCP	CHP - Yes EE – Not specified (compliance costs embedded)	Yes
Energy Efficiency Program Costs		
Utility Costs (Marketing, PP&A, STAT, Incentive, Evaluation,	Yes	Yes
Shareholder Incentive	Yes	Yes
Customer Cost	Yes	Yes

Both the electric and natural gas portfolios are highly cost-effective under the RI Test and the TRC Test, as shown in Table 35. For example, the 2021 RI Test result for the electric portfolio shows a RI Test BC Ratio of 4.31. This means that for every $1 of investment in energy efficiency $4.31 of benefits are generated.

Table 35. Comparison of Portfolio-level RI Test and TRC Test

Fuel	Test	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
Electric	RI Test	4.31	4.02	4.08	4.13	4.20
	TRC	1.95	1.81	1.84	1.86	1.91
Gas	RI Test	3.00	3.03	3.04	3.04	3.06
	TRC	1.61	1.66	1.66	1.67	1.67

8.5 Cost of Supply

The Company assessed the cost of energy supply and the cost of energy efficiency using all applicable costs enumerated in the Rhode Island Benefit Cost Framework (Framework). The Framework is a requirement of the Standards and was approved by the PUC in Docket 4600. This same method, i.e.

performing the RI Test using the cost enumerated in the Framework, was used in the 2020 and 2019 Annual Plans.

The RI Test (see also Section 8.4.1) is an appropriate mechanism to determine which costs to include in this assessment. The RI Test captures the aspects of the Framework that pertain to energy efficiency programs and details what is considered a cost of energy efficiency. The RI Test includes the benefits to Rhode Island derived from investing in energy efficiency instead of investing in additional energy supply. For the purpose of the RI Test, these energy efficiency benefits are described as *avoided costs*. The avoided costs can also be applied as the costs of procuring additional energy supply or *cost of supply*. These include costs incurred by the utility to implement the Three-Year Plan and the expense borne by the customer for its share of the energy efficiency measure cost. The 2018 AESC Study is the source for many of the values used in running the RI Test analysis for this Three-Year Plan.[40]

The Company will perform the RI Test to compare the cost of energy efficiency to the cost of energy supply using the costs categories illustrated in Table 36. The table offers an explanation for why the Company believes each cost category is either appropriate or not appropriate for inclusion in the assessment.

Table 36. List of the Cost of Energy Efficiency and Costs of Energy Supply

Cost of Energy Efficiency		
Cost	Included	Explanation
Utility Costs	Yes	These costs are incurred to achieve implementation of energy efficiency measures and programs. Includes all costs in Three-Year Plan Attachment 1. Energy Efficiency Funding Plans.
Participant Costs	Yes	Customer contribution to the installation cost of the efficient measure. Customer costs included in Three-Year Plan Attachment 1. Energy Efficiency Funding Plans.
Costs of Energy Supply		
Electric Energy Costs	Yes	Represents the cost of purchasing electric energy supply.
Electric Generation Costs	Yes	Represents cost of generation capacity in ISO-NE.
Electric Transmission Capacity Costs	Yes	Represents Pool Transmission Facilities (PTF) cost.
Electric Distribution Capacity Costs	Yes	Represents the cost of distribution capacity related to increased load.
Natural Gas Costs	Yes	Represents the cost of purchasing natural gas supply.
Fuel Costs	Yes	Non-regulated delivered fuels are an energy supply cost to customers that utilize these fuels for heating. The fuel costs in this category are separate from those embedded in the cost of the electric market. While not a direct cost of electric energy supply,

[40] Synapse Energy Economics, Avoided Energy Supply Components in New England: 2018 Report, March 30, 2018.

		National Grid includes incentives for delivered fuel energy efficiency measures in its electric portfolio. Therefore, to achieve symmetry with costs associated with electric energy efficiency, delivered fuels costs should be included in this comparison.
Water and Sewer Costs	No	While avoided water and sewer costs are a benefit of installing certain energy efficiency measures, they are not a direct cost of energy supply.
Non-Energy Impact Costs	No*	*Unless listed below. While non-energy impacts are a benefit of installing certain energy efficiency measures, they are not a direct cost of energy supply.
Income Eligible Rate Discount	Yes	Costs associated with energy being sold at the income eligible rate.
Arrearages	Yes	Costs associated with arrearage carrying costs as a result of customers not being able to pay their energy bills.
Price Effects	Yes	Represents costs associated with the impact of demand reduction on ISO-NE energy and capacity markets.
Non-embedded Greenhouse Gas Reduction Costs	Yes	Represents the social cost of carbon. The social cost of carbon is the cost associated with meeting the goals of the Resilient Rhode Island Act. Carbon emissions come from the production of energy and should be considered a cost of supplying that energy.
Economic Development	No	While economic development is a benefit of investment in energy efficiency measures it is not a direct cost of energy supply.
Non-embedded Nitrous Oxide (NOx) Costs	Yes	NOx emissions come from the production of energy and therefore the health impacts of NOx emissions should be considered part of the cost of supplying that energy.
Reliability Costs	Yes	Increased energy demand can lead to declining reserve margins and decrease reliability so should be associated with the cost of energy.

For the assessment, the Company applies the above costs of supply to the lifetime electric energy, lifetime delivered fuels energy, demand, and natural gas savings for each measure included in the Three-Year Plan in present value terms, for each year of the Plan. The costs for each year are not discounted because they occur in the first year of the program.

Applying this methodology, based on the Company's calculation, the cost of energy efficiency and supply for each year for the Three-Year Plan are presented below in Table 37 (Electric) and Table 38 (Natural Gas).

Table 37. Comparison of Cost of Electric Energy Efficiency and Alternative Supply

	2021	2022		2023	
		Base Case	High Scenario	Base Case	High Scenario
Cost of Supply	$262.0	$270.9	$283.9	$293.8	$328.0
Cost of EE Programs	$140.7	$162.4	$170.9	$176.1	$197.7
Difference	$121.3	$108.5	$112.9	$117.6	$130.4

Table 38. Comparison of Cost of Natural Gas Energy Efficiency and Alternative Supply

	2021	2022		2023	
		Base Case	High Scenario	Base Case	High Scenario
Cost of Supply	$62.5	$68.8	$78.9	$84.2	$105.2
Cost of EE Programs	$48.4	$52.0	$59.5	$61.5	$76.6
Difference	$14.2	$16.8	$19.5	$22.7	$28.7

Based on these calculations, as a result of the proposed Three-Year Plan, implementing energy efficiency plans represents $347.3 to $364.5 million in savings for electric energy efficiency, and between $53.7 to $63.3 million savings for gas energy efficiency over the lifetime of the energy efficiency measures.

FUNDING PLAN, BUDGET AND GOALS

9 Savings Goals and Potential

The savings goals presented here reflect energy savings that are ambitious but also achievable (under specified circumstances), and that secure significant cost savings and other benefits for Rhode Island energy consumers. These goals were developed using the Targets approved by the PUC for electric and natural gas energy efficiency and active electric demand response as guideposts and then applying the requisite standards of prudency and reliability. The application of these standards resulted in savings goals that do not meet the Targets approved by the PUC for the period 2021 through 2023.

Proposing savings goals is one of the primary purposes of the Three-Year Plan, as outlined in the State of Rhode Island Public Utility Commission's Lest Cost Procurement Standards. The three-year savings goals, along with budgets, are specifically called out as "illustrative and provisional" in section 3.3 Three Year Energy Efficiency and Conservation Plan of the Standards and are meant to guide the Annual Energy Efficiency and Conservation Procurement Plans.

> "ii. The Three-Year EE Plan will propose overall and initial Energy Efficiency and Conservation Procurement budgets, savings goals, and program focus and strategies for the three years of implementation beginning with January 1 of the following year. These initial budgets and goals shall be illustrative and provisional and shall guide Annual Energy Efficiency and Conservation Procurement Plans (Annual EE Plans) over the three-year period."

The EERMC proposed, and the PUC adopted, savings Targets based on the Maximum Achievable scenario within the recently completed Market Potential Study. In approving these Targets, the PUC acknowledged that the Targets did not account for prudency and reliability, which are requirements the Company must demonstrate in its Plans. Further, the Commissioners acknowledged this differs from past target-setting processes and that these Targets represent high guideposts for what is potentially achievable with efficiency programs, not accounting for other constraints. Notably, these Targets were also approved prior to a complete understanding of the likely duration and economic impact of the COVID pandemic that continues to impact Rhode Island citizens, businesses, and the economy as of the submission of this plan.

The Company's savings goals and associated budgets are intrinsically linked, and long-term benefits must be balanced against short-term rate impacts in order to ensure that programs meet all the criteria of Least Cost Procurement as described in the Standards (i.e. cost-effective, reliable, prudent, environmentally responsible, and lower than the cost of additional energy supply). During program planning for this Three-Year Plan and the concurrently filed 2021 Annual Plan, the Company applied more detailed cost estimates to savings opportunities, incorporated reliability considerations (i.e. workforce, market continuity, and program scalability), further refined program plans to ensure proposed investments and program designs supported equitable access, and considered rate and bill impacts on all customers as required to meet the prudency criteria. Incorporating these considerations

had the effect of reducing planned savings relative to the PUC's targets, particularly in 2021, in order to ensure that the filed plans achieve the prudency and reliability requirements as laid out in the Standards.

The critical path to approaching the "Max" Targets is a continuous process of identifying customers' remaining obstacles to adopting additional energy efficiency, along with market and other systemic barriers, and incrementally adjusting and enhancing program designs to apply solutions that continue to drive savings while recognizing the reality of near-term bill and rate impacts as a constraint on budgets. At the behest of stakeholders, the Company developed an illustrative "Base Case" of both savings and budgets in years 2 and 3 of the Three-Year Plan that are reflective of savings levels that are achievable in the context of a robust economic recovery in 2022 and 2023.

Should this recovery not occur, be delayed, or proceed better than expected, the Company would anticipate incorporating the latest information on customer impacts and updated expectations of economic recovery (in addition to the standard process of incorporating incremental market research, program performance, and other policy and regulatory developments) in establishing binding budgets and savings goals in subsequent 2022 and 2023 Annual Plan energy efficiency plans that would deviate from the illustrative savings goal and budget ranges included in this Three-Year Plan filing.

In a departure from past practice, the Company has included a range of illustrative savings goals and budgets for years 2022 and 2023 of the Three-Year Plan - not just the "Base Case", but also a "High Scenario". The base of these ranges (i.e. the "Base Case") represent savings goals and budgets that the Company believes, conditional upon the economic recovery expectations outlined above, could be attained in those years. The higher end of these ranges (i.e. the "High Scenario"), which are consistent with the electric and gas savings goals presented in the "Mid Scenario" of the Market Potential Study, adjusted for known evaluation, measurement and verification impacts that differ from assumptions used in that study, do not represent savings goals that the Company believes it currently has a clear path to achieving in years 2 and 3 of the Three-Year Plan. The inclusion of these higher values is consistent with the use of the "Future Innovation Adder" included in the 2018-2020 Three-Year Plan (Doc. No. 4684) where the Company, at the time, recognized aspirational savings that were in addition to what it believed was achievable based on the current information it possessed. The Company recognizes both the value of higher savings as well as a stakeholder desire to see those savings come to fruition, and the inclusion of the "High Scenario" is intended to signal to all stakeholders the Company's commitment to pursuing and evaluating paths to this higher level of achievement, even if these pathways are not currently clear.

Consistent with past practice, the ranges of budgets and goals included in this Plan are illustrative and the Company will revisit both in each subsequent Annual Plan.

9.1 EERMC Three-Year Savings Targets

On May 8, 2020 the RI PUC approved Targets for Electric and Natural Gas Energy Efficiency and active electric demand response for the period 2021 through 2023.[41] The Targets are based upon the modeled maximum achievable potential or "Max Scenario" and represent what is theoretically achievable before the application of the prudency and reliability requirements of the Least Cost Procurement Standards, and based upon the application of a now outdated set of evaluation, measurement and verification assumptions to translate customer adoption of measures to a level of claimable savings that the Company may take credit for and incorporate into benefit cost models and other planning tools. These Targets are aspirational, providing high guideposts to inspire ambitious energy savings goals.

Table 39. Electric Energy Savings Targets

	2021	2022	2023
Electric Targets (Lifetime MWh)	1,949,782	2,037,314	2,059,265

Table 40. Natural Gas Energy Savings Targets

	2021	2022	2023
Natural Gas Targets (Lifetime MMBtu)	9,598,108	9,948,779	9,958,127

Table 41. Combined Heat and Power Energy Savings Targets and Peak Reduction Targets

	2021	2022	2023
CHP Electric Energy Savings (Lifetime MWh)	723,337	723,337	723,337
CHP Peak Demand Reduction (Annual MW)	11.1	11.1	11.1

Table 42. Passive and Active Electric Peak Savings Targets

	2021	2022	2023
Passive Peak Demand Reduction (Annual MW)	30.8	33.2	33.5
Active Peak Demand Reduction (Annual MW)	33.9	52.7	74.5
Total Peak Demand Reductions (Annual MW)	64.7	85.9	108.0

9.1.1 How the Savings Targets Were Developed

In support of developing ambitious energy efficiency procurement energy savings goals, the Standards call upon the Energy Efficiency Resource Management Council (EERMC) and the Rhode Island Office of Energy Resources (OER) to prepare and submit a Three-Year Least-Cost Procurement Report and Targets. The purpose of the Report and Targets are to provide guidance for Least Cost Procurement proposed by the distribution company over the following three years. The PUC then conducts a public review of the Report and issues an order adopting specific three-year Targets for energy efficiency and conservation procurement. The Three-Year Least-Cost Procurement Report and Targets submitted by

[41] RI PUC Docket 5023. http://www.ripuc.ri.gov/eventsactions/docket/5023page.html

the EERMC and adopted by the PUC were based on the recently completed Market Potential Study's modeled maximum achievable potential.

The last comprehensive potential study was completed approximately ten years ago. Without a recent potential study, target setting in previous recent three-year planning processes relied on a top down estimation of savings, which started with an estimation of the percent of energy sales that might be achieved through energy efficiency procurement based on recent local program history, overlaid with achievements in other jurisdictions and some broader market assumptions. In contrast, using a potential study built on detailed estimates of individual program and energy efficiency measure potential in the market can provide a more data driven estimate of achievable savings. This can result in both a more refined starting point for setting top down or portfolio-wide energy savings targets, as well as identify efficiency measures with high savings potential as a starting point for building program measure mixes and designs in annual plans.

The EERMC commissioned Dunsky Energy Consulting to determine the technical, economic, and achievable levels of energy efficiency, active electric demand response, and CHP savings in the market for the period 2021 through 2026. The EERMC, OER, and DPUC managed the Market Potential Study, with input from National Grid. The study analyzed opportunities to secure savings from electric, natural gas, and delivered fuels energy efficiency measures, active demand response, heating electrification, combined heat and power (CHP), and solar photovoltaic behind-the-meter installations. The study identified all technically achievable potential, economic potential, and provided three modeled scenarios of program achievable potential; a "Low Scenario", "Mid Scenario", and "Max Scenario".

The study scenarios were modeled by starting with a "Low Scenario," designed to reflect a "business as usual" case i.e. continuing current Company offerings,[42] including program design, measures, and delivery methods, customer rebate and incentive levels, and program budgets. The "Mid Scenario" assumes enhancements to the programs to reduce customer barriers to adoption of energy efficiency and increases incentives to further improve customer economics. The maximum achievable scenario model assumes the same barrier reductions as the "Mid Scenario" and increases customer incentives to fully eliminate the customer's share of the incremental cost of the efficiency measures.

The Dunsky team used the incentive level as the primary mechanism of tuning the model to develop the three scenarios. This analytic choice, to tune savings potential primarily by increasing the incentive level, was made to simplify the modeling and was not intended to provide a reliable estimate of the true cost or budget needed to achieve measure adoption. It neither reflects an accurate estimate of the direct financial incentives necessary to drive participation not does it provide a reliable proxy for the actual cost implications of program design and delivery activities that serve to overcome financial and non-financial customer barriers other market barriers to achieving cost efficient savings. This point will be referenced in the discussion of how the savings goals were developed, as it helps to explain the variance between the Targets and savings goals.

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[42] National Grid's Rhode Island Energy Efficiency programs received a perfect 20/20 score from the American Council for an Energy Efficient Economy (ACEEE) in its 2019 State Energy Efficiency Scorecard.

9.2 National Grid's Three-Year Savings Goals

Table 43, Table 44, and Table 45 show the electric and gas portfolio savings goals with associated benefits, costs, and benefit-cost results in comparison to the Targets as proposed by the EERMC and approved by the PUC.

Table 43. 2021-2023 Docket 5023 Electric Energy Targets and Three-Year Plan Proposed Electric Energy Goals[43]

Ref	Electric Energy	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
a	Docket 5023 Electric Energy Targets (Lifetime MWh)	1,949,782	2,037,314	2,037,314	2,059,265	2,059,265
b	Docket 5023 Electric Energy CHP Targets (Lifetime MWh)[44]	723,337	723,337	723,337	723,337	723,337
c	**Docket 5023 Electric Energy Total (Lifetime MWh) (a + b)**	**2,673,119**	**2,760,651**	**2,760,651**	**2,782,602**	**2,782,602**
d	3YP Electric Energy Goal (Lifetime MWh)	1,277,943	1,287,194	1,350,211	1,371,597	1,535,656
e	3YP CHP Energy Goal (Lifetime MWh)	28,619	284,101	284,101	428,929	428,929
f	**3YP Electric Goals Total (Lifetime MWh)**	**1,306,562**	**1,571,295**	**1,634,312**	**1,800,526**	**1,964,585**
g	Difference (f – c)	-1,366,557	-1,189,356	-1,126,339	-982,076	-818,017
h	Docket 5023 Electric Energy Targets (Annual MWh)	182,299	187,378	187,378	171,353	171,353
i	Docket 5023 Electric Energy CHP Targets (Annual MWh)	45,209	45,209	45,209	45,209	45,209
j	**Docket 5023 Electric Energy Total (Annual MWh) (h + i)**	**227,508**	**232,587**	**232,587**	**216,562**	**216,562**
k	3YP Electric Energy Goal (Annual MWh)	138,047	129,667	134,808	137,279	150,751
l	3YP CHP Energy Goal (Annual MWh)	1,431	14,205	14,205	21,446	21,446
m	**3YP Electric Goals Total (Annual MWh) (k + l)**	**139,478**	**143,872**	**149,013**	**158,726**	**172,198**
n	Difference (m – j)	-88,030	-88,715	-83,574	-57,836	-44,364

[43] The RI PUC approved Targets in lifetime savings units. The equivalent annual savings units from the Market Potential Study "Max Scenario" that is the source of the Targets are shown for comparability with prior Plans that used annual units.

[44] The approved targets also included 11.1 MW of annual peak demand reduction from CHP for each year of 2021 - 2023. Not shown in this table.

Table 44. 2021-2023 Docket 5023 Natural Energy Targets and Three-Year Plan Proposed Natural Gas Energy Goals[45]

Ref	Natural Gas Energy	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
a	Docket 5023 Natural Gas Targets (Lifetime MMBtu)	9,598,108	9,948,779	9,948,779	9,958,127	9,958,127
b	3YP Natural Gas Goals (Lifetime MMBtu)	4,206,444	4,635,880	5,317,230	5,626,011	7,030,038
c	Difference (b – a)	-5,391,664	-5,312,899	-4,631,549	-4,332,116	-2,928,089
d	Docket 5023 Natural Gas Targets (Annual MMBtu)	749,344	770,569	770,569	787,805	787,805
e	3YP Natural Gas Goals (Annual MMBtu)	425,359	448,390	501,616	525,178	634,717
f	Difference (e – d)	-323,985	-322,179	-268,953	-262,627	-153,088

Table 45. 2021-2023 Docket 5023 Peak Demand Reduction Targets and Three-Year Plan Proposed Peak Demand Reduction Goals

Ref	Electric Peak Demand	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
a	Docket 5023 Energy Efficiency Passive Peak Demand Reduction Target (Annual MW)	30.8	33.2	33.2	33.5	33.5
b	Docket 5023 CHP Peak Demand Reduction Target (Annual MW)	11.1	11.1	11.1	11.1	11.1
c	**Docket 5023 Total Energy Efficiency Passive Peak and CHP Demand Reduction Target (Annual MW) (a +b)**	**41.9**	**44.3**	**44.3**	**44.6**	44.6
d	3YP Energy Efficiency Passive Peak Demand Reduction Goal (Annual MW)	22.6	21.9	22.8	22.8	25.1
e	3YP CHP Passive Peak Demand Reduction Goal Total (Annual MW)	0.2	0.0	0.0	0.0	0.0
f	**3YP Energy Efficiency Passive Peak Demand Reduction Goal Total (Annual MW) (d + e)**	**22.7**	**21.9**	**22.8**	**22.8**	**25.1**
g	Difference (f – c)	-19.2	-22.4	-21.5	-21.8	-19.5
h	Docket 5023 Active Demand Response Peak Demand Reduction (Annual MW)	33.9	52.7	52.7	74.5	74.5

[45] The RI PUC approved Targets in lifetime savings units. The equivalent annual savings units from the Market Potential Study "Max Scenario" that is the source of the Targets are shown for comparability with prior Plans that used annual units.

Ref	Electric Peak Demand	2021	2022		2023	
			Base Case	High Scenario	Base Case	High Scenario
i	Dunsky Max Scenario ISO-NE Equivalent Peak	See Footnotes[46]			103	103
j	3YP Active Peak Demand Reduction Goal (Annual MW)	39.3	46.5	59.7	53.7	76.2
k	Difference (j - i)	See Footnotes			-49.3	-26.8

9.2.1 How the Proposed Savings Goals Were Developed

In previous three-year planning cycles, the Company began its assessment of potential by reviewing past performance across the portfolio of programs, including the scale of achieved savings as well as fixed and unit costs associated with programs and individual savings measures. As noted previously, this was all completed without benefit of a recent comprehensive market potential assessment. The Company worked with its program managers, vendors and sales team to estimate the pipeline for the next year, and to the extent feasible, the next three years. This pipeline assessment was then weighted by several factors, including historic accuracy of predictions. In general, the six to eight months estimate of potential sales is relatively strong, while sales estimates further out become a less reliable tool for identifying potential. The Company would then apply several additional factors both to programs and to measures including historic performance, extent of saturation of known opportunities, customer acceptance and market readiness, costs and scalability for newer technologies and delivery approaches, and workforce readiness and availability, all of which modify the achievable potential. The Company would also apply lessons learned from recent evaluations as well as feedback from customers and delivery partners, and incorporate estimates of new potential that may be unlocked from new initiatives or enabling strategies that had been or would be implemented during the prospective plan period.

As noted previously, in this three-year planning cycle, the Company and stakeholders benefitted from the recently completed Market Potential Study in developing the savings goals in this Three-Year Plan. While planning began prior to the finalization of the study in May 2020, the development of the market potential study changed the planning process in fundamental ways. First, it allowed for a more accurate, data driven assessment of the energy efficiency measures which were reaching saturation and which measures offered the highest remaining opportunity. It also quantified the shift in program opportunity from easy to install independent energy savings measures to dependence on comprehensive packages of highly interactive combinations of measures that have high installation costs and customer acceptance barriers and depend on a well-developed workforce with broad skill sets and specialized training. The most critical insight gained from the Market Potential Study was confirmation that continued energy efficiency savings are dependent on a new era of program design where savings result

[46] The ISO-NE equivalent peak demand reduction targets from Appendix G of the Market Potential Study are shown in this table for year 2023. This study result is comparable to the method by which National Grid tracks and reports peak reductions and is more comparable than the Target value. Appendix G from the MPS does not provide ISO-NE equivalent values for 2021 and 2022. See the EERMC's website for detailed Appendix G file: http://rieermc.ri.gov/wp-content/uploads/2020/05/ri-study-appendix-g-read-only.xlsx

from *comprehensive* energy solutions. The Market Potential Study helped to highlight where the Company needed to place investments and develop new strategies.

In coordination with the EERMC and its consultants, the National Grid team cross-referenced the range of achievable potential scenarios included in the Market Potential Study from the top down (i.e. looking at the savings goals produced by the Study at the portfolio level and program levels) and from the measure-level (market potential and savings potential).

As discussed in the preceding section 9.1.1 How the Savings Targets Were Developed, the model used did not generate a reliable estimate of the true cost or budget needed to achieve measure adoption - just a simplified, high-level estimate based on the application of blunt assumptions to modeled potential volumes of measures and assumed programmatic fixed costs. The Company therefore cross-referenced the Market Potential Study results with its own historical costs. The Company worked with program managers, vendors and sales teams to gain insight into customer acceptance and market readiness, potential costs and scalability for newer technologies and delivery approaches, and workforce readiness and availability. This allowed the Company to develop, and share with stakeholders, a more nuanced understanding of the programs' ability to ramp and capture potential savings represented in the Market Potential Study.

To arrive at the "Base Case" savings presented herein, the Company then used its benefit cost planning tools to build an interactive bottom-up model to develop savings estimates based on specific program-level and measure-level mixes. Unlike the Market Potential Study model, with this tool the Company can see the interactive effects of savings and budget and can tune the model with budget estimates that more accurately reflect reasonable costs estimates. This model also allows the Company to see how incorporating other desired portfolio goals – including equitable access for all customers, investment in workforce development and R&D in measures and approaches with longe-term potential but not the likelihood to deliver significant savings within the planning window - for the next phase of program design impact budget and savings. Given the Company's lack of a current clear path to achieving the "High Scenario" savings, these savings were assumed through an equal allocation of savings across all non-behavioral programs with the exception of CHP that was not scaled, and Demand Response, that was scaled only in commercial offerings. Correspondingly, budget requirements were estimated through scaling budgets above the "Base Case" in equal proportion to the difference between "Base Case" and "High Scenario" savings.

9.3 Savings Targets as Compared to Goals

The Three-Year Plan illustrative goals do not match the Targets set based on the "Max" achievable potential as can be seen in Tables 33, 34 and 35 in Sec. 10.2 above. The process that resulted in the Targets provided an aspirational savings guidepost that did not incorporate critical planning considerations essential to assuring programs provide equitable access to all customers, balancing near term savings with building a steady and resilient set of energy efficiency programs and associated workforce that can continue to secure cost effective savings over the full Plan term.

Instead, the Targets were built by scaling a business as usual model based on 2019 program experience in an attempt to quantify the potential for energy efficiency savings, and were not adjusted to account for or attempt to model the impacts of COVID-19 and the resulting economic downturn. The Targets assume a linear increase over planned 2020 savings despite the real reductions in savings achieved in 2020, significant workforce and delivery impacts that require investment to build back to 2020 planned levels, and do not reflect continued uncertainty on how and when the economy will begin to recover. Additionally, the modeling process that produced the Targets was not intended to provide a reliable estimate of the true cost or actual budget needed to achieve measure adoption, and as such, did not apply any budget constraints and did not offer a detailed estimate of the likely costs required to achieve modeled savings.

Hence, the Company applied more detailed cost estimates to savings opportunities and analyzed non-financial barriers to achieving potential (discussed further in Section 9.4). In addition, the Company applied critical reliability considerations during program planning; specifically, incorporating issues related to workforce, market continuity, and program scalability. The Company is investing in building flexibility into program delivery and supporting workforce efforts that will allow us to preserve, rebuild and grow the energy efficiency workforce, in part in response to COVID-19. These investments are critical to ensuring longer term goals and supporting economic recovery, however are unlikely to produce identifiable savings in the first year of the Plan. In general, incorporating these considerations has the effect of reducing year 1 savings in order to make investments that preserve other benefits to customers and ensure the long-term viability of energy efficiency programs.

The Company has a powerful but limited set of levers available to increase program participation and thereby savings. The Company can directly change incentive levels and increase or decrease technical assistance and marketing. National Grid can also, working with partners, directly support broader education, awareness, workforce behavior and development, and installation quality. Most of these levers can be turned upwards to increase savings but will simultaneously increase cost and near-term surcharge requirements. Conversely, they can be turned down, which is likely to reduce near-term costs and surcharges, at the expense of both near-term, and potentially longer-term, savings.

The Company's savings goals also incorporate prudency considerations, ensuring that investments are equitable and consider rate and bill impacts on all customers. In the first year of the Three-Year Plan, the Company has committed to maintain a flat system benefit charge in response to the significant economic challenges faced by our customers in light of the COVID-19 pandemic. This firm budgetary limit is the primary, binding constraint limiting the Company from setting higher 2021 savings goals that would come closer to achieving the Targets based on the "Maximum" scenario. In addition, the Company is balancing the portfolio's achievement of near savings with strategic investments to support small businesses and low- and moderate-income customers who may be most vulnerable to the economic and other impacts of COVID. These investments, due to their higher cost per saving, also have the effect of limiting savings goals in the surcharge constrained 2021 environment.

While the Company has set the range of savings targets for 2022 and 2023 with an optimistic expectation of economic recovery (and, in the case of the "High Scenario" range of savings, currently unidentified pathways to achieving those savings), they too do not reach the "Maximum Achievable"

MPS scenario-based Targets. The primary barrier to raising savings goals to the maximum level is the associated program budgets and resulting customer funding required to achieve more aggressive savings levels in each year of the Plan. However, budget is not the only barrier. The critical path to approaching the "Maximum Achievable Scenario" Targets is a continuous process of identifying customers' remaining obstacles to adopting additional energy efficiency, along with market and other systemic barriers, and incrementally adjusting and enhancing program designs to apply solutions that continue to drive savings while also recognizing that resulting budget requirements are directly related to rate and bill impacts that are a component of the prudency standard that the Company must continually meet in proposing Energy Efficiency plans.

9.4 Evaluating and Addressing Barriers to "Max" Savings Targets

During conversations with stakeholders around the development of this Three-Year Plan, the parties determined a need to document approaches to addressing gaps between the goals outlined in this Plan and the results of the Market Potential Study that informed the Targets as approved by the PUC in Docket 5023. Over the course of several months, the Company undertook an analysis of the top measures identified in the Potential Study and considered the barriers to adoption of these measures at levels that would support the Targets. The Company then presented and discussed these findings with stakeholders at Technical Working Group (TWG) and EERMC meetings. Further analysis was undertaken to group barriers into categories with relative weighting of the impact to achieving targets. For example, in the residential sector, the primary areas of focus were:

- HVAC
- Envelope
- Products
- Hot Water
- Plug Load
- Lighting
- Behavior
- Whole Building
- Custom Measures

These measures were then analyzed across five categories of barriers and ranked based on ability to deliver savings. The five barriers were:

- **Financial (or Monetary):** Customer economics, technical resources, system integration.
- **Workforce**: Auditors, commission agents, experienced controls programmers.
- **Customer Information:** Awareness, priorities, expertise.
- **Code:** Changes to baselines that will impact claimable savings.
- **Other:** Site conditions, dependencies on outside actors, programmatic barrier.

Within each barrier category, the Company has also identified potential barrier mitigation strategies and approaches that could be utilized to address, and reduce the impact of, identified barriers.

Descriptions of typical barriers identified within each barrier category, and the strategies and approaches the Company will continue to evaluate over the course of implementing programs in the next three years, are listed below in Table 46.

Table 46. Identified Programmatic Barriers to Customer Adoption and Potential Mitigation Strategies and Approaches

Barrier	Description	Identified Barrier Mitigation Strategies and Approaches
Financial	• Customer Economics • Project Economics • Technical Resources • System Integration	• Evaluate alternative finance options for customers • Reconsider presentation of finance options such as "cash flow" benefits of finance • Incentives for behavior change to sustain energy savings • Partner with external funding sources to reduce financing costs borne by customers • Continual evaluation of incentive levels to drive optimum participation while minimizing rate impacts
Workforce	• Aging Workforce and Fewer New Entrants • Available Auditors • Commission Agents/Controls Programmers	• Training and education – Design and Implementation/Maintenance and Operations • Partner with technical school students and local colleges • Survey contractors to learn gaps in necessary training
Customer	• Awareness • Priorities • Expertise	• Create customer awareness of benefits of complex Energy Efficiency solutions through comprehensive marketing • Work with other industries such as realtors and home inspector • Partner with municipalities to educate customers on benefits of Energy Efficiency
Code or Other Programmatic Barriers	• Changes to Baselines Affect Net Savings • Site Conditions • Dependencies on Outside Actors • Programmatic or Technological Barriers	• Creation of Energy Information Platform to provide customer intelligence • Market Sector Approach - to implement curated technologies specific to a market e.g. Telecom, Lodging, Restaurants etc. • Continued investment in investigation and advancement of emerging technologies

In the majority of scenarios across both C&I and Residential sectors, a key identified barrier to customer adoption was "Financial." As such, while not all customers will require a 100% incentive to move forward with a project, there are still substantial financial hurdles for many customers. This is where the company will focus opportunity investigation and evaluation efforts, including evaluating alternative finance options for customers.

Another common barrier tended to be customer-related, in that customers were either not aware of savings opportunities and efficiency program offers, or have competing priorities that must be overcome to move forward with adoption. This is where it is important to create a comprehensive marketing approach that cultivates customer awareness of the benefits of energy efficiency. In all cases, the Company will need to continue to work with stakeholders in order to optimize incentive levels that drive desired customer adoption of measures (and the resulting savings and benefits) while balancing the potentially competing goal of maximizing the cost efficiency of our programs.

In the Residential and Income Eligible sectors, the Company considered issues around the aging workforce and the availability of auditors and weatherization contractors to be another large barrier. Hence, in the coming years the Company proposes increased investment in workforce development, and a focus on training and educational opportunities for contractors.

Within the C&I sector, the Company believes there to be more programmatic barriers, including availability of necessary technologies and site conditions, that would fall within the "Other" category.

Across both sectors, "Code" remained the least common barrier, though it remains an important consideration, as expectations of future code changes should necessarily influence decisions around investing in programmatic design changes in pursuit of potential current claimable savings opportunities that might be more cost effectively achieved through alternative (i.e. codes and standards based) mechanisms.

The Company and stakeholders agree that further analysis to not only identify the impact of these barriers, but develop solutions to mitigate that impact, will be needed over the course of the Three-Year Plan. The Company commits to collect and analyze the information needed to further understand the impact and relative scale of the specific barriers noted above, and those barriers that may not yet be obvious, or currently identified. This process is already underway and will continue through the next three years.

The pre-weatherization case study that follows in the next section illustrates an approach the Company will continue to refine over the next Three-Year Plan to further evaluate, understand, and develop approaches for mitigation of barriers to higher savings thresholds through the planning process that will inform the 2022 and 2023 Annual Energy Efficiency Plans.

9.4.1 Case Study: Pre-Weatherization Barriers within EnergyWise

Energy*Wise* is the flagship in-home comprehensive energy efficiency offering for all Rhode Islanders in single family residences (defined as one to four-unit buildings). The program offers comprehensive energy efficiency services using a whole house approach to identify energy saving opportunities in all major energy systems and uses, including heating and water heating systems, appliances, lighting, water saving measures, plug loads, and building envelope leaks.

All market rate customers with either an electric or gas National Grid account can participate. Customers with any heating fuel type, including delivered fuels, are served. Delivered fuel customers can receive services through their electric account. Homeowners, renters, and landlords are all encouraged to participate.

9.4.1.1 Three-Year Savings Weatherization Goals and Targets

Through the planning process that led to the goals included in this Plan, the Company estimated that weatherization through the Energy*Wise* program can contribute substantial annual and lifetime savings in each year of the Three-Year Plan. These savings estimates are shown in the chart below based on the 2022 and 2023 base savings goal along with the comparable weatherization opportunity (single family insulation) identified by the Market Potential Study "Max Scenario" that informed the Targets.

Table 47. Three-Year Weatherization Goals from "Base Case" – Lifetime Energy Savings

Electric Weatherization Savings	**2021**	**2022**	**2023**
Three-Year Plan	4,879 MWh	5,289 MWh	6,455 MWh
Market Potential Study ("Max Scenario")	13,229 MWh	13,295 MWh	13,361 MWh
Natural Gas Weatherization Savings	**2021**	**2022**	**2023**
Three-Year Plan	474,699 MMBTU	487,933 MMBTU	625,301 MMBTU
Market Potential Study ("Max Scenario")	979,113 MMBTU	984,008 MMBTU	988,928 MMBTU

9.4.1.2 Barriers to Additional Savings Potential from Weatherization

To understand the barriers to additional savings through residential weatherization, the Company analyzed data on adoption of weatherization in recent program history, analyzed changes that were

made due to the COVID-19 pandemic, and assessed the details of the adoption assumed in the Market Potential Study.

Traditionally, the Company has offered incentives for weatherization ranging from 50% of total costs up to 75%. This generally results in a 30-40% adoption rate for weatherization depending on the incentive offered. During the COVID-19 pandemic the program offered a 100% incremental incentive in order to drive adoption of weatherization during a period when that demand would likely have otherwise lagged due to customer economic challenges and/or concerns around allowing vendors into their homes. (This increased incentive was also implemented with the goal of building the weatherization job pipeline and backlogs the Company felt would be necessary to motivate weatherization contractors to be more aggressive in bringing back to work employees who were furloughed or laid off during the period of time when COVID health and safety concerns necessitated the Company's temporary suspension of on-premise energy efficiency service delivery by contracted vendors). The increased incentive has had the desired impact, leading to an increase in adoption of recommended weatherization measures identified during Energy*Wise* home energy assessments from 40% to 80%. However, 20% of customers are still not adopting[47] weatherization, even when that work is offered at no cost to them. This demonstrates that there are further barriers, outside of purely financial considerations, that prevent customers from moving forward with adoption.

Chief among these, the Company believes, is the prevalence of a variety of pre-weatherization barriers that prevent customer adoption of weatherization measures. These include the presence of hazards such as vermiculite, asbestos, mold, and knob-and-tube wiring. Remediation of these barriers can be challenging, time consuming, and expensive. Moreover, the inconvenience of the weatherization process itself, due to household disruption beyond these pre-weatherization hazards, also presents a barrier to customer adoption. The Company is undertaking a process to prioritize barrier significance in terms of magnitude and addressability in order to focus on areas where our programs can have the largest and most cost-efficient impact in reducing barriers to weatherization adoption.

9.4.1.3 Mitigating Pre-Weatherization Barriers in the 2021 Annual Plan

Approximately 45%[48] of all home energy assessments have some type of pre-weatherization barrier that prevents the customer from moving forward with the weatherization project. The energy efficiency programs currently provide a $250 incentive to either remediate health & safety barriers or to certify the barrier has been addressed. Barriers that can be resolved with the incentive primarily involve upgrades or maintenance to the heating system. If the customer does not have a contractor with whom they are comfortable working, it can take additional time to obtain multiple quotes for a remediation project. To simplify the process, the Program will facilitate connections to HVAC and electrical

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[47] While this data point cites information collected during the COVID-19 pandemic, there are other circumstances where 100% incentives still do not drive customer adoption, as was the case with Heat Pumps in the Income Eligible Multifamily program that were offered at 100% incentive but the maintenance required, along with the physical appearance of the systems on the outside of the property, resulted in the project not moving forward.
[48] This is a conservative number based on three-year average from 2016-2018 data. 2020 completed EnergyWise evaluation shows 64% of homes in 2019 had a pre-weatherization barrier. This could be an increasing barrier as programs continue to go deeper and more non-barriered homes have been served.

contractors that resolve the most common types of pre-weatherization barriers, removing one additional task for the customer.

For barriers that exceed the $250 incentive, the Company and interested stakeholders are looking for external resources that provide funding or financing[49] for these barriers as well as opportunities to coordinate those offerings into the customer journey. The alleviation of pre-weatherization barriers was also a recommendation from the recently completed Energy*Wise* evaluation and thus will be key focus for the Company not only in the Annual Plan, but over the course of the 2021-23 Three-Year Plan.

9.4.1.4 Areas of Exploration to Further Mitigate Pre-Weatherization Barriers During the Term of the Three-Year Plan

While the pre-weatherization barriers are highly prevalent and wide ranging, there are some additional areas that can support this quantification. Current information presented above is a subset of data based on market-rate, single family customers. The Company will also be working to quantify the single family income eligible program information where pre-weatherization barriers are likely to closely resemble, if not exceed, the data of market rate housing. The Company will also be observing results of pre-weatherization pilots that are beginning in NY and CT.

Discussions at the end of 2020 have begun to identify and align with organizations such as Green and Healthy Homes (GHHI) that align, braid, and coordinate funding to overcome some of the pre-weatherization barriers. Continued discussions will focus on what additional funding may exist for RI customers to address health and safety concerns within their homes. It is important to note that while the energy efficiency programs will coordinate to the best of the program's abilities to simplify the overall pre-weatherization remediation process, it currently appears that funding requirements that rely solely on energy efficiency funding for these measures will significantly exceed currently available resources. Knob and tube wiring, the most prevalent pre-weatherization barrier, costs upwards of $7,500 to remediate if it exists throughout the home. This expense easily exceeds the average customer cost of close to $1,000 for weatherization. Additional research on customer preferences on customer discretionary income will inform the programs' abilities to overcome this barrier. When the cost for remediation is $10,000, households will frequently be weighing that cost against other major household improvements such as bathroom upgrades, new roof, etc., and even non-household expenditures such as vacations.

The most immediately available support the Company can provide for pre-weatherization will be to provide customers with contact information for remediation services and where possible work with other organizations to coordinate customer timelines so that less disruption is required from the customer. The Company has successfully worked with GHHI in the past on a lead remediation in the income eligible programs. It will also be valuable for customers to understand remediation costs so that budgeting for these upgrades are possible.

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[49] The Company started allowing up to $10,000 of pre-weatherization barriers to be financed on the HEAT loan starting in 2019. Only specific barriers can be financed. There has been limited uptake to report on at this time.

9.5 Continued Evaluation of Savings Goals in Annual Plans

Over the next three years, the Company will continue to evaluate energy efficiency opportunities as markets develop, and will account for these developments in the binding savings goals and associated budgets embedded in the 2022 and 2023 Annual Plans. As each Annual Plan is developed, the savings goals and budgets contained therein may deviate from the illustrative goals and budgets established in this Three-Year Plan. In each subsequent Annual Plan, the Company will ask the PUC to approve the goals, budgets, and funding mechanism pursuant to Section 3.4 (C) of the LCP Standards and R.I. Gen. Laws §§ 39-1-27.7(c)(4).

The recent past saw the transformation of the lighting market and reduced opportunities for the programs to claim savings from efficient lighting. Alternatively, over the course of the last three-year plan, gas savings opportunities were identified and ensuing annual plans were adjusted to increase goals accordingly.

The EERMC's Targets Filing Memorandum acknowledge this potential for change:

> "Further, to support consideration of the distinction between Targets and the goals associated with Three-Year EE Procurement Plans and Annual EE Plans, we acknowledge that while the 2021-2023 electric and natural gas savings targets have been developed using the best information and data available at this time, additional relevant information is likely to be learned as time passes. Consequently, the annual savings targets, including considerations such as their associated budgets as estimated during the planning process, should be reviewed each year during the development of the Annual Plans. Following this review, the plan goals should either be determined to remain identical to the Targets, or revised in light of new information… The parties participating in the Annual Plan development should agree that revisions to the annual energy savings targets should be based only on clearly documented changes in cost-effective resource availability, or unforeseeable and/or unavoidable constraints to their full pursuit and achievement".[50]

The Company, in collaboration with the EERMC and stakeholders, will seek opportunities to continue driving efficiency savings in its Annual Plans, including revisiting the results of the Market Potential Study to inform annual planning.

[50] EERMC Targets Filing Memorandum in RI PUC Docket 5023. http://www.ripuc.ri.gov/eventsactions/docket/5023-EERMC-Targets-Yrs2021-2032Memo%20+%20Slides_2020_03_23.pdf

10 Funding Plan

The following funding sources may be used in each year. The amounts from each source will be detailed in Annual Plans. The electric funding plan is funded by the first three sources.

1. One line on the customers' bill currently labeled "Energy Efficiency Programs" comprised of the existing energy efficiency program charge of $0.01121 per kWh[51][52], plus a fully reconciling funding mechanism charge in accordance with RI Gen. Laws § 39-1-27.7. This total of the two factors is represented by the "EE Charge per kWh" row 17 in Three-Year Plan Attachment 1. Energy Efficiency Funding Plans.
2. Revenue resulting from the participation of energy efficiency resources in ISO-New England's forward capacity market (FCM).
3. Projected large C&I commitments.
4. Proceeds from the auction of Regional Greenhouse Gas Initiative allowances pursuant to RI Gen. Laws § 23-82.6.
5. Funds from any state, federal, or international climate or cap and trade legislation or regulation including, but not limited to, revenue or allowances allocated to expand energy efficiency programs.
6. For the 2020 Year End Fund Balance, a credit in the electric energy efficiency fund in the amount of $469,641.16, including interest, pursuant to the PUC Open Meeting on September 1, 2020 in relation to Docket No. 4755 Navy CHP Settlement Agreement.
7. Other sources as may be identified by the EERMC and the Company.

The gas funding plan is funded by the following sources:

1. One line on the customers' bill labeled "Energy Efficiency Programs" comprised of the existing average energy efficiency program charge of $0.601 per Dth, plus a fully reconciling funding mechanism charge in accordance with RI Gen. Laws § 39-1-27.7. This total of the two factors is represented by the "EE Program Charge per Dth", rows 15a and 15b, in Three-Year Plan Attachment 1. Energy Efficiency Funding Plans.
2. There are many uncertainties associated with the exact amount of additional funding needed, such as company sales, customer co-payments, commitments made for future years, the settlement price for future FCM auctions, identification of additional outside sources of funding, the impacts of COVID-19 on collections, and the Company's success in minimizing costs in order to maximize customer benefit. In each subsequent Annual Plan, the Company will incorporate new information

[51] The "existing" energy efficiency charge refers to the 2019 EE charge because Attachment 1 includes the 2020 Annual Plan as the initial year prior to 2021-2023 Three-Year Plan. The Attachment therefore utilizes the 2019 EE charge as the "existing" energy efficiency charge on line 2.

[52] An additional $0.00030/kwh for the Renewable Energy Fund charge is combined with the EE and SRP charge that appears on customers' bills.

on each of these elements.

Due to these uncertainties, the Company illustrates the amount of funding it expects to need in each year of the Three-Year Plan (including both the “Base Case” and “High Scenario” in 2022 and 2023), and asks for provisional approval of these amounts in order to guide the development of those future Annual Plans. Three-Year EE Plans that include a combined filing of the first year of Annual EE Plans pursuant to Section 3.3.B.v of the Least Cost Procurement Standards, shall be filed on or before October 15, 2020 and triennially thereafter. In the following two years Annual EE Plans will be filed on or before October 1.

Although the Three-Year Plan Attachment 1. Energy Efficiency Funding Plans do not show sector-specific funding levels, the Company will continue its practice of having the residential and commercial and industrial sectors subsidize income-eligible sector energy efficiency programs in order to provide equity in the availability of program funds and opportunities to benefit from energy efficiency, which is an identified core component in the Standards and a priority of stakeholders.

The Company intends to continue to work with various market actors (vendors, distributors, designers, and builders) to obtain the best pricing for services to achieve program savings goals while controlling costs. The Annual Plans, including the attached filing of the 2021 Annual Plan, will reflect progress made in leveraging other sources of funding, if applicable.

11 Performance Incentive Plan

11.1 Background and Process

This section details the recent history and structure of Energy Efficiency Performance Incentive Mechanisms (PIMs) in Rhode Island, as well as the process that National Grid, OER, DPUC, and the EERMC engaged in during April-September 2020 to develop and propose a new performance incentive for the 2021-2023 Three-Year Energy Efficiency Plan that would take effect with the 2021 Annual Energy Efficiency Plan.

11.1.1 History of PIM

The Company has had the opportunity to earn a performance incentive based on outcomes achieved in the delivery of its energy efficiency programs since at least 2003 for electric programs and 2008 for natural gas programs, as indicated in historical tables E-11 and G-11 of its most recent 2020 Annual Energy Efficiency Plan.[53]

In recent history, approved PIMs have included the following characteristics:

Table 48. Characteristics of Approved Performance Incentive Mechanisms

Earning Opportunity and Allocation	The Company's performance "design level" (i.e. the Company's anticipated earnings in the event that achieved outcomes exactly match committed and approved savings goals and spending levels in each Annual Plan) incentive earning opportunity pool has been established at 5% of approved eligible spending budget since 2013. Each year, this total pool has been further divided, first by portfolio (electric vs. gas) and then by sector (market-rate residential, income eligible, commercial and industrial). See Figure 4 for the recent history of these absolute 'design' level performance incentive earning opportunities.
Performance Evaluation Basis	Company performance within the electric portfolio has historically been determined on the basis of achievement of annual electric energy savings (MWh) and passive demand reductions (kW) due to energy efficiency measures, relative to planned levels. Within the gas portfolio, performance has been evaluated on the basis of achievement of annual natural gas energy savings (MMBtu).

[53] See for example, table E-11 and G-11 in the 2020 Annual Energy Efficiency Plan, Docket 4979: http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-Compliance-RevElecTables(12-20-19).pdf http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-2020%20EEPP%20Revisions%20-%20Tables%20and%20Testimony%20(12-6-2019).pdf

	To promote and account for cost efficiencies in the delivery of savings, adjustments have been made to planned goals in specific circumstances where actual spending has been greater or less than planned savings. The general impact of these mechanisms has been to increase Company performance incentive earnings when cost efficiencies have been realized, while penalizing the Company when the actual unit cost to achieve planned savings has been higher than planned.
Earnings Thresholds and Caps	In recent history, within each sector, the Company has begun earning performance incentives (at 25% of design level), upon achieving 75% of planned savings (adjusted for approved spending adjustment mechanisms). Earnings have grown linearly, to the point where the Company would earn 100% of planned performance incentive levels upon achievement of 100% of spend-adjusted planned savings goals. Above achievement of 100% of spend-adjusted planned savings, the Company maintained the opportunity to scale earnings on a linear basis, up to the opportunity to earn a maximum of 125% of planned performance incentives at achievement of 125% or more of spend-adjusted planned savings. See Figure 5 for a graphical representation of the recent historical relationship between spend-adjusted realized savings relative to plan and Company earnings opportunity relative to 'design level' performance incentive pool. The purpose of the earnings thresholds and caps was to account for the inherent uncertainty associated with exogenous factors that could impact the Company's ability to deliver planned savings, to encourage the Company to commit to more aggressive goals than the Company would likely support in an environment where earnings only began at 100% achievement of planned savings, and to protect customers from uncapped performance incentive mechanisms payments to the Company in the event of significant over-performance.

Figure 4. Historical Approved Performance Incentive Earning Opportunity, 2012-2020

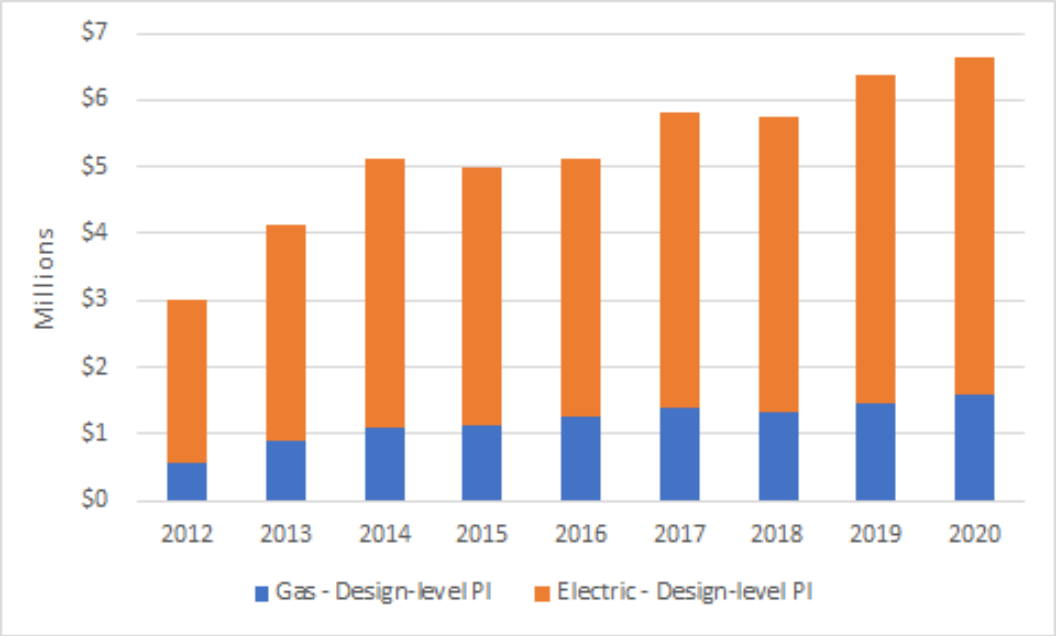
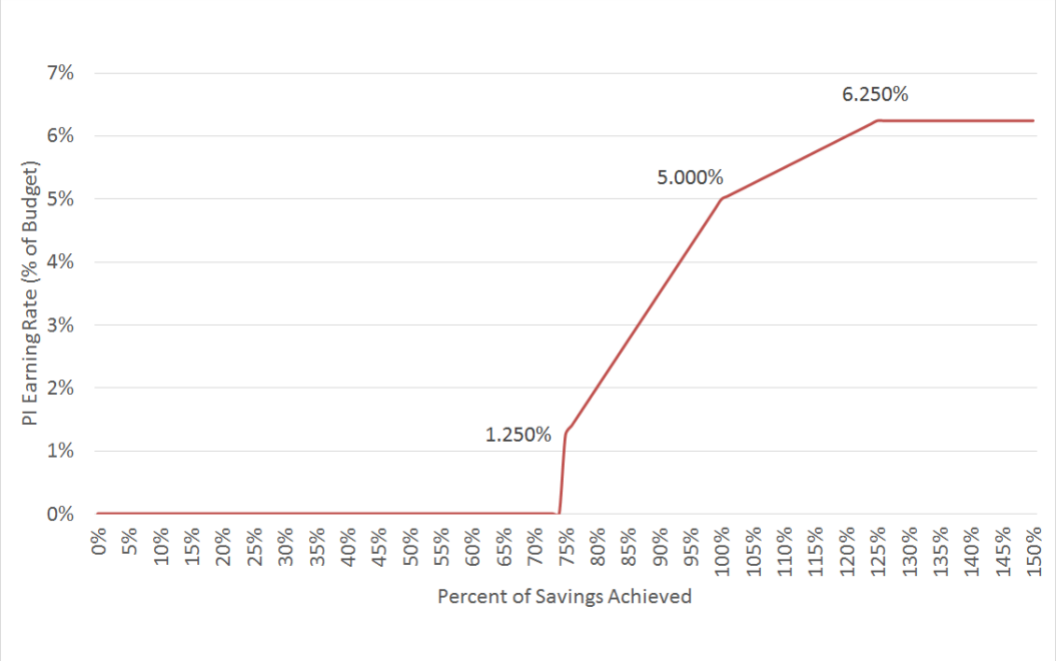


Figure 5. Historical relationship between Ratio of Actual Savings to Planed Savings and Earned Performance Incentive



11.1.2 Modifications to Performance Incentive Mechanism in 2020

In the 2020 Annual Plan, several adjustments to the historical performance incentive mechanism were approved, largely related to the spending adjustment factors that rewarded cost efficiency and penalized higher than planned spending in the achievement of realized savings in specific circumstances.

Additionally, in the 2020 Annual Plan, the Company committed to working with stakeholders, including the Office of Energy Resources and the Division of Public Utilities and Carriers, to revisit the Energy Efficiency Performance Incentive Mechanism in the 2021-23 Three-Year Plan, including a go-forward de-coupling of the historical formulaic 5% link between planned implementation budgets and the design level performance incentive pool.

11.1.3 Process for 2021 – 2023 Three-Year Plan and 2021 Annual Plan

The 2021-2023 Three-Year and the 2021 Annual Energy Efficiency plans have benefited from the release of both revised PIM Principles in Docket 494354, as well as final Least Cost Procurement Standards adopted by the PUC in Docket 5015.55.

In parallel with the development and release of these guidance and Standards documents, the Company also engaged closely with stakeholders in 2020 to evaluate the existing performance mechanism and develop a proposed new mechanism.

This process began with an identification of stakeholder perspectives on the positive and negative aspects of the current performance incentive mechanism structure. A summary of these perspectives is show below in Table 49

Table 49. Summary of Stakeholder Perspectives on Existing Performance Incentive Mechanisms

Benefits of Current PIM Structure	Drawbacks of Current PIM Structure
Relatively simple to implement and track performance. Communication around earning opportunity is direct and simple for both internal National Grid staff, external parties, and the general public.	Company earning opportunity explicitly tied to Program Budgets – creates perceived incentive to grow the program budget irrespective of achieved benefits, penalizes Company for pursuit of cost efficiency during planning process
Has supported nation-leading EE programs for many years (i.e. has historically driven desired outcomes)	Aligned with achievement of energy and demand savings that drive societal benefits, but no direct connection to those societal benefits
Relatively straightforward, clear identification of priorities – provides two core variables for Company to steer on. Directly tied to energy and demand savings from EE programs	Not directly or clearly tied with other state policy goals – e.g. local workforce development
Savings are a quantifiable, objective, straightforward measurement of Company achievement, and largely reward outcomes that are under Company's control	Asymmetry in slope of over/under-performance payments acts as a disincentive for the Company to agree to aggressive / stretch goals

[54] RI PUC Docket 4943: http://www.ripuc.ri.gov/eventsactions/docket/4943page.html
[55] RI PUC Docket 5015: http://www.ripuc.ri.gov/eventsactions/docket/5015page.html

Independent sector level performance evaluation discourages Company from de-emphasizing any one sector in pursuit of savings in other sectors	Sector level performance evaluation deviates from some elements of PUC PIM principles, may discourage company pursuit of maximum benefits in some circumstances
Spend vs. budget adjustment mechanisms promote cost efficiency, provide a proxy benefit sharing model	Division between energy savings and passive demand payments increases Company risk, as a practical matter may not always drive desired behaviors
Provides Company with path to stability, growth in achievable earnings potential when desired outcomes are achieved	Disconnect between demand response / PST-based incentive mechanism and the energy efficiency PIM mechanism

Through this process, stakeholders also developed a set of objectives and desired outcomes from the PIM redesign process with the recognition that not all of these objectives would be achievable through any redesign (i.e. some are somewhat mutually exclusive, or at least work at cross purposes). Many of the objectives below are shared across multiple stakeholders while some are specific to individual entities:

Table 50. Summary of Stakeholder Perspectives on Desired PIM Structure Redesign

Identified Stakeholder Objectives for PIM Structure Redesign
• Alignment and consistency with guidance provided in Dockets No. 4943 (PIMs Guidance Docket) and 5015 (LCP Standards Docket) • Decoupling of explicit/formulaic linkage between earning opportunities and program budgets • Ensure that Energy Efficiency program investments are valued by the Company – parity or alignment with alternative business earnings • Ensure that state policy is integrated/reflected in prioritized program outcomes • Alignment of positive customer outcomes – cost savings, ratepayer benefits, societal benefits - with the Company's incentive earnings • A mechanism that encourages the Company to pursue and achieve maximum possible savings, while optimizing cost-efficiency and being cognizant of other constraints • Parity between earning upside and downside in order to properly incent stretch goals • Optimization of and alignment with achievement of societal benefits • Support the creation of sustainable Energy Efficiency markets and market transformations where appropriate • Clarity and simplicity in the establishment, evaluation, measurement and internal and external communication around goals and targets, and connected to data that the Company currently tracks, analyzes and/or reports on • Reward outcomes as opposed to being overly prescriptive in incenting / rewarding paths to desired outcomes • Growth and stability in achievable earnings potential

11.2 New PIM Proposal

Following from the above stakeholder process and resulting analysis, the Company proposes the following PIM structure. While the details of each component of the mechanism are described in more detail below, the core elements of the proposed mechanism are as follows:

- Individual annual total incentive pools will be established each year on a negotiated basis for the Electric and Gas portfolios.
- These total annual portfolio-level incentive pools will be allocated each year, also on a negotiated basis, across four sub-segments: market rate residential programs, income-eligible programs, commercial and industrial programs, and a cross-cutting "equity metric."
- Achievement or earnings within each non "equity metric" pool will be based on Company achievement of net benefits within that sector, relative to planned achievement of sector-specific net benefits. The specific measure of performance within the "equity metric" pool will be negotiated each year, based on availability of measurable data and on desired outcomes related to equity.
- Achievement of earnings within each sub-segment will remain independent, and subject to earning thresholds and caps. The default earning threshold for each sub-segment will be set at 75%, and the default earning cap will set at 125%, though each cap and threshold may be independently evaluated and adjusted for each sub-segment within each Annual Plan as conditions warrant.
- The proposed mechanism specifically excludes any performance incentive opportunity related to achievement of outcomes related to Company efforts to advance Codes and Standards, though (as addressed in Section 3.2.4 of the 2021 Annual Plan) the Company and stakeholders anticipate continuing to evaluate potential options here with a goal of proposing an incremental mechanism specific to this area in the 2022 Annual Plan.

11.2.1 Net Benefits Framework

The core of the new performance incentive mechanism for energy efficiency will be based on a net benefits framework, where the Company's earning opportunity will be defined as a percentage of the total benefits generated by energy efficiency programs less the cost to achieve those benefits. Specific components of this proposal are outlined in subsections below. The net benefits framework will only apply to energy efficiency programs and therefore will remove the planned and achieved benefits and costs associated with the active demand response (Connected Solutions) programs, as a separate Peak Reduction PIM continues to exist for those programs.

11.2.1.1 Total Benefits

The total pool of benefits achieved in each sub-segment will be defined by the benefits that are quantified and monetized in the RI Test as applied to the energy efficiency portfolio and programs, with

the exception of the macroeconomic benefits defined here and in the RI Test as the additional state gross domestic product generated by the programs.[56]

Macroeconomic benefits will be excluded from the pool of total benefits used for purposes of calculation of the performance incentive mechanism due to the implications of their inclusion, and specifically to the potentially perverse impact that the inclusion of such benefits in the performance incentive mechanism could have on incenting Company pursuit of and achievement of cost efficiencies in the delivery of energy efficiency programs.

The macroeconomic benefits included in the RI Test are calculated by multiplying programmatic spending by a multiplier for each program.[57] For example, the macroeconomic multiplier for the electric Residential HVAC program is 1.42. For each $1 of program spending within the electric Residential HVAC program, $1.42 of incremental macroeconomic benefits are estimated to be created. Were these macroeconomic benefits to be included in the total pool of benefits credited to the Company's programs for purposes of calculating the performance incentive, the Company would earn a greater performance incentive for spending more to achieve a specified savings outcome (and earn less for spending less to achieve that same spending outcome). The purpose of a net benefits framework is to properly incent the Company to maximize benefits while maintaining cost controls to do so; including RI Test macroeconomic benefits in this calculation would run counter to this goal.

While the macroeconomic benefits are appropriate to include in the RI Test for screening programs and portfolios of energy efficiency investments per the Docket 4600 guidance, the Company and stakeholders ultimately determined that it would be most consistent with PIM principles and desired outcomes to omit macroeconomic benefits from the calculation of benefits for performance incentive earning opportunity.

11.2.2 Costs to be Netted from Total Benefits

In order to calculate the pool of net benefits, the Company will subtract the cost to achieve from the pool of benefits as defined in the preceding section. The pool of costs subtracted from total benefits is defined as the "eligible spending budget". The eligible spending budget will be set in a manner consistent with past practice in setting the costs that are directly tied to the programmatic activities that generate savings and benefits, and will contain the costs to implement the programs in the following categories:

- Program Planning & Administration
- Marketing
- Cost of services and product rebates/incentives provided to customers
- Sales, Technical Assistance & Training

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[56] The RI Test as applied in the energy efficiency context is a benefit cost test developed to apply the Benefit-Cost Framework developed in the Guidance Document in RI PUC Docket 4600A (http://www.ripuc.ri.gov/eventsactions/docket/4600A-PUC-GuidanceDocument-Notice_8-3-17.pdf). The RI Test is intended to properly assess efficiency as a resource, align the screening of efficiency programs and portfolios with state policy goals, and

[57] Attachment 4 of the 2021 Annual Energy Efficiency Plan provides detail on the macroeconomic multipliers, how they were developed, and how they are applied.

- Evaluation & Market Research

Costs that will be omitted from the calculation of eligible spending budget are:

- Participating customer costs
- Commitments
- Regulatory costs for OER and EERMC
- Pilot costs
- Assessment costs
- Performance Incentive

11.2.3 Sector Earning Thresholds and Caps

As in prior years, the Company's earning opportunity will be established by independently determined achievement within specified sub-segments (market rate residential, income eligible, and commercial and industrial sectors) in both the electric and gas portfolio. The maintenance of this sector based approach strikes an appropriate balance between providing the Company with necessary flexibility to maximize achievement of benefits in light of evolving market conditions over the course of the year, while also ensuring appropriate transparency and accountability for delivery of benefits to customers segments.

For all sectors within both the gas and electric portfolios, each Annual Plan will default to the Company not earning any performance incentive until 75% of planned net benefits have been achieved. Upon achievement of 75% of planned net benefits, the Company will be eligible to earn 75% of the target performance incentive for that sector. The Company's sector specific earning opportunity will grow linearly, in line with the proportion of realized net benefits to planned net benefits. As with the current performance incentive mechanism, Company earnings will be capped at 125% of the target incentive pool, based on achieving or exceeding 125% of planned PIM net benefits exclusive of economic benefits. Between each sector's threshold and cap, the earning opportunity will be linear, such that for each incremental unit of net benefit achieved, the incremental earning is the same throughout the range.

While sector specific thresholds and caps will default to these levels within each Annual Plan, each of these elements will be independently evaluated and may be adjusted for each sector within each Annual Plan, as conditions warrant.

11.2.4 Equity Metric

During discussions with stakeholders, several parties communicated a desire for a partial allocation of the performance incentive earning opportunity to be linked to the achievement of desired program outcomes related to customer equity.

In the absence of more robust historical baseline data around the composition and attributes of program participants, the parties have agreed that the level of energy efficiency participation delivered to rental units can likely serve as a near-term proxy for measuring participation by moderate-income residential customers, customers for whom English is not a primary language, and other customer demographic categories whom stakeholders have identified as priority segments for equity purposes. The Company has introduced more robust renter tracking capabilities in 2020, with the expectation of creating a set of baseline data of sufficient breadth and quality through mid-2021 to become the basis of a "rental unit" equity metric to be incorporated into the 2022 performance incentive mechanism to be

proposed in the 2022 Annual Plan. The specific allocation of the share of the overall performance incentive pool to this metric will be proposed in the 2022 Annual Plan.

11.2.5 Performance Incentive Payout Rates

Actual performance incentive earnings will be calculated based on applying a specified 'payout rate' to each dollar of claimed net benefits attributable to the Company's energy efficiency programs, as specified in Section 11.2.1. These sector specific payout rates will be determined annually, on the basis of sector specific planned benefits and implementation costs and the allocation of the overall performance incentive pool to each sector.

CONCLUSION

12 Conclusion and Requested Rulings

In accordance with the LCP Standards adopted by the PUC in Docket 5015, the Company requests that the PUC approve the following:

- Initial three year energy savings goals and strategies for Energy Efficiency and Conservation Procurement programs and portfolio; provided that such goals may be updated annually.
- Initial three year budget plan for Energy Efficiency and Conservation Procurement programs and portfolio; provided that specific budgets will be proposed and approval sought through the annual plans.
- The structure of the performance incentive mechanism proposed herein, with specific goals, earning rates, and provided that the specific earning opportunity is determined in subsequent binding annual plans.

ATTACHMENTS

Three-Year Plan Attachment 1. Energy Efficiency Funding Plans

Attachment 1 Table 1. 2021 – 2023 Electric Funding Plan - Base Case

2021-2023 Energy Efficiency Plan: Electric Funding Plan Base Case						
PART A: TOTAL FUNDING AND GOALS		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
1)	Projected kWh Sales:	7,113,299,305	6,606,545,391	6,774,853,822	6,960,791,359	
2)	2019 Effective EE Charge	$0.01121	$0.01121	$0.01121	$0.01121	
3)	**Projected DSM Revenues from DSM Charge = (1) x (2)**	**$79,740,085**	**$74,059,374**	**$75,946,111**	**$78,030,471**	**$228,035,956**
4)	Other Sources of DSM Funding					
4a)	Projected Commitments from prior year	$-	$-	$-	$-	$-
4b)	Projected Entering Fund Balance and Interest:	$1,699,941	$19,961,695	$-	$-	$19,961,695
4c)	Projected Capacity FCM Payments from ISO-NE:	$17,481,764	$16,017,995	$14,547,606	$10,082,947	$40,648,549
4d)	Projected RGGI Proceeds					
4)	**Subtotal Other Sources of DSM Funding**	**$19,181,704**	**$35,979,691**	**$14,547,606**	**$10,082,947**	**$60,610,244**
5)	**Projected Funding Available from Traditional Sources = (3) + (4)**	**$98,921,790**	**$110,039,064**	**$90,493,718**	**$88,113,418**	**$288,646,200**
6)	**Implementation Budget**	**$104,242,086**	**$115,114,909**	**$127,991,046**	**$140,193,625**	**$383,299,580**
7)	Other Expenses					
7a)	Estimated Commitments to Future Years	$-	$-	$-	$-	$-
7b)	Target Incentive	$5,054,448	$5,500,000	$5,500,000	$5,500,000	$16,500,000
7c)	EERMC Expenses	$893,686	$845,559	$1,188,445	$1,355,447	**$3,389,450**
7d)	OER Expenses	$893,686	$845,559	$1,188,445	$1,355,447	**$3,389,450**
7)	**Subtotal Additions to Program Expenses**	**$6,841,821**	**$7,191,117**	**$7,876,890**	**$8,210,894**	**$23,278,901**
8)	Other Budget Requests	$-	$-	$-	$-	$-
9)	**Total Funding Required = (6) + (7) + (8)**	**$111,083,907**	**$122,306,026**	**$135,867,936**	**$148,404,519**	**$406,578,481**
Line	**Notes:**					
1	Sales from Company sales forecast (Fall 2020) and includes Streetlights.					
2	2019 EE Charge includes uncollectable recovery and System Reliability factor. See Line 13, Table E-1, December 23, 2019 Compliance Filing in Docket 4979 (2020 EE Plan). http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-Compliance-RevElecTables(12-20-19).pdf. An additional $0.00030/kwh for the Renewable Energy Fund charge is combined with the EE and SRP charge that appears on customers' bills.					
4a	There are no commitments planned at this time.					
4b	Projected Entering Fund Balance source is the projected 2019 Year-End Fund Balance as included in the 2020 Annual Plan. Year 2021 Fund Balance source is the projected 2020 Year-End Balance as included in the 2021 Annual Plan. 2022 and 2023 assume no Year-End Fund Balance.					
4c	FCM Payments based on internal estimates.					
6	Program expenses include implementation and evaluation expenses and RIIB funding. They do not include OER, EERMC, or target performance incentives.					
7b	2020 Target incentive is equal to 5% of eligible spending budget, which excludes OER, EERMC, Commercial ConnectedSolutions, Residential ConnectedSolutions, Assessments, and Pilots. Refer to 2020 EE Plan Tables E-2, E-3, and E-9. 2021 performance incentive is based on the proposed value for the 2021 Annual Plan, Tables E-2, E-3, and E-9. The Company anticipates that future performance incentive values will be established in the context of setting binding budgets and energy savings goals for the 2022 and 2023 Annual Plans.					
7c	EERMC Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					
7d	OER Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					

2021-2023 Energy Efficiency Plan: Electric Funding Plan Base Case (continued)						
PART B: FULLY RECONCILING FUNDING		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
10)	Projected Funding Available = (5)	$98,921,790	$110,039,064	$90,493,718	$ 88,113,418	$288,646,200
11)	Fully Reconciling funding needed from additional source = (8) - (9)	$12,162,118	$12,266,962	$45,374,218	$ 60,291,101	$117,932,281
12)	Fully Reconciling funding charge per kWh = (11) / (1)	$0.00170	$0.00185	$0.00669	$0.00866	$ -
13)	Currently Effective EE Charge = (2)	$0.01121	$0.01121	$0.01121	$0.01121	$ -
14)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism = (12) + (13)	$0.01291	$0.01306	$0.01790	$0.01987	$ -
15)	Proposed SRP Opex Factor per kWh, excluding uncollectible recovery:	$0.00015	$ -	$-	$-	$ -
16)	Currently Effective Uncollectible Rate	1.30%	1.30%	1.30%	1.30%	$ -
17)	**Proposed Energy Efficiency Program charge per kWh, including uncollectible recovery = (14)+(15) / (1-(16))**	**$0.01323**	**$0.01323**	**$0.01813**	**$0.02013**	
PART C: Plan TARGETS AND COST/LIFETIME kWh						
18)	Plan Goal, Annual Net MWh	178,423	139,478	143,872	158,726	442,076
19)	Plan Goal, Net Lifetime MWh	1,527,817	1,306,562	1,571,295	1,800,526	4,678,382
20a)	Plan Goal, Annual Net Peak kW Savings (passive)	29,793	22,723	21,866	22,776	67,364
20b)	Plan Goal, Annual Net Peak kW Savings (active)	50,672	39,339	46,452	53,656	139,447
	RI Test	-	-	-	-	-
21a)	Total benefits	$598,696,281	$606,490,655	$653,356,839	$726,732,762	$1,986,580,256
22a)	Net benefits = (21a) - (9)	$487,612,373	$484,184,629	$517,488,903	$578,328,243	$1,580,001,775
23)	Customer Costs	$17,398,102	$18,435,780	$26,524,977	$ 27,736,953	$72,697,710
24a)	Cost/lifetime kWh = ((9) + (23) - (7b)) / (19)*1000	$0.081	$0.104	$ 0.100	$ 0.095	$0.099
25a)	Benefit Cost Ratio = (21a) / ((9) + (23))	4.66	4.31	4.02	4.13	4.14
26a)	Utility Spending per lifetime kWh = ((6)+ (7b)) / (19)) / 1000	$0.072	$0.092	$ 0.085	$ 0.081	$0.085
	TRC Test	$ -	$ -	$-	$-	$ -
21b)	Total benefits	$318,877,305	$274,105,039	$293,152,375	$328,112,171	$895,369,585
22b)	Net benefits = (21b) - (9)	$207,793,398	$151,799,013	$157,284,440	$179,707,652	$488,791,104
23)	Customer Costs	$17,398,102	$18,435,780	$26,524,977	$ 27,736,953	$72,697,710
24b)	Cost/lifetime kWh = ((9) + (23) - (7b)) / (19)*1000	$0.081	$0.104	$ 0.100	$ 0.095	$0.099
25b)	Benefit Cost Ratio = (21b) / ((9) + (23))	2.48	1.95	1.81	1.86	1.87
26b)	Utility Spending per lifetime kWh = ((6)+ (7b)) / (19)) / 1000	$0.072	$0.092	$ 0.085	$ 0.081	$0.085
Line	**Notes:**					
21-26	21-26a reflects benefit/cost using the RI Test and 21-26b reflects benefit/cost using the TRC Test. Benefits and Costs are Inclusive of savings from the ConnectedSolutions active demand response program.					

Attachment 1 Table 2. 2021 – 2023 Electric Funding Plan - High Scenario

2021-2023 Energy Efficiency Plan: Electric Funding Plan High Scenario						
PART A: TOTAL FUNDING AND GOALS		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
1)	Projected kWh Sales:	7,113,299,305	6,606,545,391	6,774,853,822	6,960,791,359	
2)	2019 Effective EE Charge	$0.01121	$0.01121	$0.01121	$0.01121	
3)	**Projected DSM Revenues from DSM Charge = (1) x (2)**	**$79,740,085**	**$74,059,374**	**$75,946,111**	**$ 78,030,471**	**$228,035,956**
						$ -
4)	Other Sources of DSM Funding	-				$ -
4a)	Projected Commitments from prior year	$ -	$ -	$-	$-	$ -
4b)	Projected Entering Fund Balance and Interest:	$1,699,941	$19,961,695	$-	$-	$19,961,695
4c)	Projected Capacity FCM Payments from ISO-NE:	$17,481,764	$16,017,995	$14,547,606	$ 10,082,947	$40,648,549
4d)	Projected RGGI Proceeds	$ -	$ -	$-	$-	$ -
4)	**Subtotal Other Sources of DSM Funding**	**$19,181,704**	**$35,979,691**	**$14,547,606**	**$ 10,082,947**	**$60,610,244**
5)	**Projected Funding Available from Traditional Sources = (3) + (4)**					$ -
		$98,921,790	**$110,039,064**	**$90,493,718**	**$ 88,113,418**	**$288,646,200**
6)	**Implementation Budget**					$ -
		$104,242,086	**$115,114,909**	**$135,193,341**	**$158,306,651**	**$408,614,901**
7)	Other Expenses					$ -
7a)	Estimated Commitments to Future Years	-	$ -	$-	$-	$ -
7b)	Target Incentive	$ -	$ -	$-	$-	$ -
7c)	EERMC Expenses	$5,054,448	$5,500,000	$ 5,500,000	$ 5,500,000	$16,500,000
7d)	OER Expenses	$893,686	$845,559	$1,247,867	$1,520,812	**$3,614,238**
7)	**Subtotal Additions to Program Expenses**	$893,686	$845,559	$1,247,867	$1,520,812	**$3,614,238**
		$6,841,821	**$7,191,117**	**$ 7,995,734**	**$ 8,541,624**	**$23,728,475**
8)	Other Budget Requests	**$ -**	**$ -**	**$-**	**$-**	**$ -**
		$ -	$ -	$-	$-	$ -
9)	**Total Funding Required = (6) + (7) + (8)**	$ -	$ -	$-	$-	$ -
Line	**Notes:**					
1	Sales from Company sales forecast (Fall 2020) and includes Streetlights.					
2	2019 EE Charge includes uncollectable recovery and System Reliability factor. See Line 13, Table E-1, December 23, 2019 Compliance Filing in Docket 4979 (2020 EE Plan). http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-Compliance-RevElecTables(12-20-19).pdf. An additional $0.00030/kwh for the Renewable Energy Fund charge is combined with the EE and SRP charge that appears on customers' bills.					
4a	There are no commitments planned at this time.					
4b	Projected Entering Fund Balance source is the projected 2019 Year-End Fund Balance as included in the 2020 Annual Plan. Year 2021 Fund Balance source is the projected 2020 Year-End Balance as included in the 2021 Annual Plan. 2022 and 2023 assume no Year-End Fund Balance.					
4c	FCM Payments based on internal estimates.					
6	Program expenses include implementation and evaluation expenses and RIIB funding. They do not include OER, EERMC, or target performance incentives.					
7b	2020 Target incentive is equal to 5% of eligible spending budget, which excludes OER, EERMC, Commercial ConnectedSolutions, Residential ConnectedSolutions, Assessments, and Pilots. Refer to 2020 EE Plan Tables E-2, E-3, and E-9. 2021 performance incentive is based on the proposed value for the 2021 Annual Plan, Tables E-2, E-3, and E-9. The Company anticipates that future performance incentive values will be established in the context of setting binding budgets and energy savings goals for the 2022 and 2023 Annual Plans.					
7c	EERMC Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					
7d	OER Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					

2021-2023 Energy Efficiency Plan: Electric Funding Plan High Scenario (continued)						
PART B: FULLY RECONCILING FUNDING		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
10)	Projected Funding Available = (5)	$98,921,790	$110,039,064	$90,493,718	$ 88,113,418	$288,646,200
11)	Fully Reconciling funding needed from additional source = (8) - (9)	$12,162,118	$12,266,962	$52,695,357	$ 78,734,857	$143,697,176
12)	Fully Reconciling funding charge per kWh = (11) / (1)	$0.00170	$0.00185	$0.00777	$0.01131	$ -
13)	Currently Effective EE Charge = (2)	$0.01121	$0.01121	$0.01121	$0.01121	$ -
14)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism = (12) + (13)	$0.01291	$0.01306	$0.01898	$0.02252	$ -
15)	Proposed SRP Opex Factor per kWh, excluding uncollectible recovery:	$0.00015	$ -	$-	$-	$ -
16)	Currently Effective Uncollectible Rate	1.30%	1.30%	1.30%	1.30%	$ -
17)	**Proposed Energy Efficiency Program charge per kWh, including uncollectible recovery = (14)+(15) / (1-(16))**	**$0.01323**	**$0.01323**	**$0.01922**	**$0.02281**	
		$ -				
PART C: Plan TARGETS AND COST/LIFETIME kWh			-			
18)	Plan Goal, Annual Net MWh	178,423	139,478	149,013	172,198	460,689
19)	Plan Goal, Net Lifetime MWh	1,527,817	1,306,562	1,634,312	1,964,585	4,905,459
20a)	Plan Goal, Annual Net Peak kW Savings (passive)	29,793	22,723	22,774	25,104	70,601
20b)	Plan Goal, Annual Net Peak kW Savings (active)	50,672	39,339	59,682	76,181	175,202
	RI Test	-	-	-	-	-
21a)	Total benefits	$598,696,281	$606,490,655	$696,592,377	$830,726,438	$2,133,809,471
22a)	Net benefits = (21a) - (9)	$487,612,373	$484,184,629	$553,403,303	$663,878,163	$1,701,466,095
23)	Customer Costs	$17,398,102	$18,435,780	$27,724,189	$ 30,810,899	$76,970,869
24a)	Cost/lifetime kWh = ((9) + (23) - (7b)) / (19)*1000	$0.081	$0.104	$ 0.101	$ 0.098	$0.100
25a)	Benefit Cost Ratio = (21a) / ((9) + (23))	4.66	4.31	4.08	4.20	4.19
26a)	Utility Spending per lifetime kWh = ((6)+ (7b)) / (19)) / 1000	$0.072	$0.092	$ 0.086	$ 0.083	$0.087
	TRC Test	$ -	$ -	$-	$-	$ -
21b)	Total benefits	$318,877,305	$274,105,039	$314,653,840	$376,616,521	$965,375,400
22b)	Net benefits = (21b) - (9)	$207,793,398	$151,799,013	$171,464,765	$209,768,246	$533,032,024
23)	Customer Costs	$17,398,102	$18,435,780	$27,724,189	$ 30,810,899	$76,970,869
24b)	Cost/lifetime kWh = ((9) + (23) - (7b)) / (19)*1000	$0.081	$0.104	$ 0.101	$ 0.098	$0.100
25b)	Benefit Cost Ratio = (21b) / ((9) + (23))	2.48	1.95	1.84	1.91	1.90
26b)	Utility Spending per lifetime kWh = ((6)+ (7b)) / (19)) / 1000	$0.072	$0.092	$ 0.086	$ 0.083	$0.087
Line	**Notes:**					
21-26	21-26a reflects benefit/cost using the RI Test and 21-26b reflects benefit/cost using the TRC Test. Benefits and Costs are Inclusive of savings from the ConnectedSolutions active demand response program.					

Attachment 1 Table 3. 2021 – 2023 Natural Gas Funding Plan - Base Case

2021-2023 Energy Efficiency Plan: Gas Funding Plan Base Case						
PART A: TOTAL FUNDING AND GOALS		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
1)	Projected Dth Volume:	42,171,352	38,608,003	39,981,521	41,201,369	
2)	2019 Effective EE Charge	$0.601	$0.601	$ 0.601	$ 0.601	
3)	**Projected DSM Revenues from DSM Charge = (1) x (2)**	$25,347,328	$23,205,557	$24,031,118	$ 24,764,314	$72,000,990
						$ -
4)	Other Sources of DSM Funding					$ -
4a)	Projected Commitments from prior year	$ -	$ -	$-	$-	$ -
4b)	Projected Entering Fund Balance and Interest:	$ (1,143,360)	$5,817,487	$-	$-	$5,817,487
4c)	Low Income Weatherization in Base Rates	$200,000	$ -	$-	$-	$ -
4)	**Subtotal Other Sources of DSM Funding**	**$(943,360)**	**$5,817,487**	**$-**	**$-**	**$5,817,487**
						$ -
5)	**Projected Funding Available from Traditional Sources = (3) + (4)**	**$24,403,969**	**$29,023,044**	**$24,031,118**	**$ 24,764,314**	**$77,818,476**
						$ -
6)	**Implementation Budget**	**$32,048,029**	**$36,274,165**	**$38,339,083**	**$ 45,169,851**	**$119,783,099**
		$ -	$ -	$-	$-	$ -
7)	Other Expenses					$ -
7a)	Estimated Commitments to Future Years	$ -	$ -	$-	$-	$ -
7b)	Target Incentive	$1,578,601	$1,700,000	$ 1,700,000	$ 1,700,000	$5,100,000
7c)	EERMC Expenses	$361,206	$321,226	$400,047	$468,377	$1,189,651
7d)	OER Expenses	$361,206	$321,226	$400,047	$468,377	$1,189,651
7)	**Subtotal Additions to Program Expenses**	**$2,301,013**	**$2,342,453**	**$ 2,500,094**	**$ 2,636,754**	**$7,479,301**
						$ -
8)	**Total Funding Required = (6) + (7)**	**$34,349,042**	**$38,616,618**	**$40,839,177**	**$ 47,806,605**	**$127,262,400**

Line	**Notes:**
1	From the Company's Q2 2020 Gas Forecast. Includes projections for firm and non-firm customers, excludes exempt DG customers. For exempt DG customers, 2021 exemption volume assumed for 2022 - 2023.
2	The Currently Effective Average Charge is illustrated as one charge, shared among residential and commercial customers. The charge is separated into separate charges by customer segment on lines 15a and 15b.
4a	There are no commitments planned at this time.
4b	Projected Entering Fund Balance source is the projected 2019 Year-End Fund Balance as included in the 2020 Annual Plan, See Line 2, Table G-1, December 2, 2019 Compliance Filing in Docket 4979 (2020 EE Plan) http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-2020 EEPP-E-1 & G-1 Tables (12-2-19).pdf. Year 2021 Fund Balance source is the projected 2020 Year-End Balance as included in the 2021 Annual Plan. 2022 and 2023 assume no Year-End Fund Balance.
7b	2020 Target incentive is equal to 5% of eligible spending budget, which excludes OER, EERMC, Assessments, and Pilots. Refer to 2020 EE Plan Tables G-2, G-3, and G-9. 2021 performance incentive is based on the proposed value for the 2021 Annual Plan, Tables G-2, G-3, and G-9. The Company anticipates that future performance incentive values will be established in the context of setting binding budgets and energy savings goals for the 2022 and 2023 Annual Plans.
7c	EERMC Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.
7d	OER Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.

2021-2023 Energy Efficiency Plan: Gas Funding Plan Base Case (continued)						
PART B: POTENTIAL INCREMENTAL FUNDING NEEDED		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
9)	Projected Funding Available = (5)	$24,403,969	$29,023,044	$24,031,118	$24,764,314	$77,818,476
10)	Fully Reconciling funding needed from additional source = (8) - (9)	$9,945,073	$9,593,574	$16,808,059	$23,042,291	$49,443,924
11)	Fully Reconciling funding charge per Dth = (10) / (1)	$0.235	$0.248	$0.420	$0.559	
12)	Currently Effective Average EE Charge = (2)	$0.601	$0.601	$0.601	$0.601	
13)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism = (11) + (12)	$0.836	$0.849	$1.021	$1.160	
14)	Currently Effective Uncollectible Rate	1.91%	1.91%	1.91%	1.91%	
15)	**Proposed Average Energy Efficiency Program charge per Dth including uncollectible recovery = (13) / (1-(14))**	**$0.852**	**$0.865**	**$1.040**	**$1.182**	
15a)	Proposed Residential Energy Efficiency Program charge per Dth including uncollectible recovery	$1.011	$1.011	$1.234	$1.403	
15b)	Proposed Commercial & Industrial Energy Efficiency Program charge per Dth including uncollectible recovery	$0.704	$0.704	$0.859	$0.977	
PART C: PLAN TARGETS AND COST/LIFETIME Dth						
16)	Plan Goal, Annual Dth	446,621	425,359	448,390	525,178	1,398,927
17)	Plan Goal, Lifetime Dth	4,816,261	4,206,444	4,635,880	5,626,011	14,468,336
	RI Test					
18a)	Total benefits	$143,440,133	$144,975,124	$157,697,125	$187,070,491	$489,742,739
19a)	Net benefits = (18a) - (8)	$109,091,091	$106,358,506	$116,857,948	$139,263,886	$362,480,339
20)	Customer Costs	$9,225,261	$9,744,826	$11,154,288	$13,691,480	$34,590,594
21a)	Cost/lifetime Dth = ((8) + (20)-(7b)) / (17)	$8.72	$11.09	$10.85	$10.63	$10.83
22a)	Benefit-Cost Ratio = (18a) / (8) + (20)	3.29	3.00	3.03	3.04	3.03
23a)	*Utility Spending per lifetime Dth = ((6)+ (7b)) / (17)*	$6.98	$9.03	$8.64	$8.33	$8.63
	TRC Test					
18b)	Total benefits	$79,694,604	$77,918,379	$86,144,553	$102,413,143	$266,476,075
19b)	Net benefits = (18) - (8)	$45,345,562	$39,301,761	$45,305,377	$54,606,537	$139,213,675
20)	Customer Costs	$9,225,261	$9,744,826	$11,154,288	$13,691,480	$34,590,594
21b)	Cost/lifetime Dth = ((8) + (20)-(7b)) / (17)	$8.72	$11.09	$10.85	$10.63	$10.83
22b)	Benefit-Cost Ratio = (18b) / (8) + (20)	1.83	1.61	1.66	1.67	1.65
23b)	Utility Spending per lifetime Dth = ((6)+ (7b)) / (17)	$6.98	$9.03	$8.64	$8.33	$8.63
Line	**Notes:**					
15a & 15b	3YP is projected at a portfolio level therefore the split between residential and C&I charges is based of 2021 Annual Plan and will be updated in subsequent Annual Plans.					
21-26	21-26a reflects benefit/cost using the RI Test and 21-26b reflects benefit/cost using the TRC Test.					

Attachment 1 Table 4. 2021 – 2023 Natural Gas Funding Plan - High Scenario

2021-2023 Energy Efficiency Plan: Gas Funding Plan High Scenario						
PART A: TOTAL FUNDING AND GOALS		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
1)	Projected Dth Volume:	42,171,352	38,608,003	39,981,521	41,201,369	
2)	2019 Effective EE Charge	$0.601	$0.601	$ 0.601	$ 0.601	
3)	**Projected DSM Revenues from DSM Charge = (1) x (2)**	$25,347,328	$23,205,557	$24,031,118	$ 24,764,314	$72,000,990
4)	Other Sources of DSM Funding					
4a)	Projected Commitments from prior year	$ -	$ -	$-	$-	$ -
4b)	Projected Entering Fund Balance and Interest:	$ (1,143,360)	$5,817,487	$-	$-	$5,817,487
4c)	Low Income Weatherization in Base Rates	$200,000	$ -	$-	$-	$ -
4)	**Subtotal Other Sources of DSM Funding**	**$(943,360)**	**$5,817,487**	**$-**	**$-**	**$5,817,487**
5)	**Projected Funding Available from Traditional Sources = (3) + (4)**	**$24,403,969**	**$29,023,044**	**$24,031,118**	**$ 24,764,314**	**$77,818,476**
						$ -
6)	**Implementation Budget**	**$32,048,029**	**$36,274,165**	**$44,023,751**	**$ 56,521,052**	**$136,818,968**
7)	Other Expenses					$ -
7a)	Estimated Commitments to Future Years	$ -	$ -	$-	$-	$ -
7b)	Target Incentive	$1,578,601	$1,700,000	$ 1,700,000	$ 1,700,000	$5,100,000
7c)	EERMC Expenses	$361,206	$321,226	$460,054	$587,242	$1,368,522
7d)	OER Expenses	$361,206	$321,226	$460,054	$587,242	$1,368,522
7)	**Subtotal Additions to Program Expenses**	**$2,301,013**	**$2,342,453**	**$ 2,620,108**	**$ 2,874,484**	**$7,837,045**
						$ -
8)	**Total Funding Required = (6) + (7)**	**$34,349,042**	**$38,616,618**	**$46,643,860**	**$ 59,395,535**	**$144,656,013**
Line	**Notes:**					
1	From the Company's Q2 2020 Gas Forecast. Includes projections for firm and non-firm customers, excludes exempt DG customers. For exempt DG customers, 2021 exemption volume assumed for 2022 - 2023.					
2	The Currently Effective Average Charge is illustrated as one charge, shared among residential and commercial customers. The charge is separated into separate charges by customer segment on lines 15a and 15b.					
4a	There are no commitments planned at this time.					
4b	Projected Entering Fund Balance source is the projected 2019 Year-End Fund Balance as included in the 2020 Annual Plan, See Line 2, Table G-1, December 2, 2019 Compliance Filing in Docket 4979 (2020 EE Plan) http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-2020 EEPP-E-1 & G-1 Tables (12-2-19).pdf. Year 2021 Fund Balance source is the projected 2020 Year-End Balance as included in the 2021 Annual Plan. 2022 and 2023 assume no Year-End Fund Balance.					
7b	2020 Target incentive is equal to 5% of eligible spending budget, which excludes OER, EERMC, Assessments, and Pilots. Refer to 2020 EE Plan Tables G-2, G-3, and G-9. 2021 performance incentive is based on the proposed value for the 2021 Annual Plan, Tables G-2, G-3, and G-9. The Company anticipates that future performance incentive values will be established in the context of setting binding budgets and energy savings goals for the 2022 and 2023 Annual Plans.					
7c	EERMC Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					
7d	OER Expenses equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 1%.					

2021-2023 Energy Efficiency Plan: Gas Funding Plan High Scenario (continued)						
PART B: POTENTIAL INCREMENTAL FUNDING NEEDED		**2020**	**2021**	**2022**	**2023**	**Three Year Total**
9)	Projected Funding Available = (5)	$24,403,969	$29,023,044	$24,031,118	$24,764,314	$77,818,476
10)	Fully Reconciling funding needed from additional source = (8) - (9)	$9,945,073	$9,593,574	$22,612,742	$34,631,221	$66,837,536
11)	Fully Reconciling funding charge per Dth = (10) / (1)	$0.235	$0.248	$0.565	$0.840	
12)	Currently Effective Average EE Charge = (2)	$0.601	$0.601	$0.601	$0.601	
13)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism = (11) + (12)	$0.836	$0.849	$1.166	$1.441	
14)	Currently Effective Uncollectible Rate	1.91%	1.91%	1.91%	1.91%	
15)	**Proposed Average Energy Efficiency Program charge per Dth including uncollectible recovery = (13) / (1-(14))**	**$0.852**	**$0.865**	**$1.188**	**$1.469**	
15a)	Proposed Residential Energy Efficiency Program charge per Dth including uncollectible recovery	$1.011	$1.011	$1.410	$1.743	
15b)	Proposed Commercial & Industrial Energy Efficiency Program charge per Dth including uncollectible recovery	$0.704	$0.704	$0.982	$1.214	
PART C: PLAN TARGETS AND COST/LIFETIME Dth						
16)	Plan Goal, Annual Dth	446,621	425,359	501,616	634,717	1,561,692
17)	Plan Goal, Lifetime Dth	4,816,261	4,206,444	5,317,230	7,030,038	16,553,713
	RI Test					
18a)	Total benefits	$143,440,133	$144,975,124	$181,080,604	$234,086,409	$560,142,137
19a)	Net benefits = (18a) - (8)	$109,091,091	$106,358,506	$134,436,745	$174,690,874	$415,486,124
20)	Customer Costs	$9,225,261	$9,744,826	$12,827,431	$17,166,100	$39,738,357
21a)	Cost/lifetime Dth = ((8) + (20)-(7b)) / (17)	$8.72	$11.09	$10.86	$10.65	$10.83
22a)	Benefit-Cost Ratio = (18a) / (8) + (20)	3.29	3.00	3.04	3.06	3.04
23a)	*Utility Spending per lifetime Dth = ((6)+ (7b)) / (17)*	$6.98	$9.03	$8.60	$8.28	$8.57
	TRC Test					
18b)	Total benefits	$79,694,604	$77,918,379	$98,932,107	$128,176,461	$305,026,947
19b)	Net benefits = (18) - (8)	$45,345,562	$39,301,761	$52,288,247	$68,780,926	$160,370,934
20)	Customer Costs	$9,225,261	$9,744,826	$12,827,431	$17,166,100	$39,738,357
21b)	Cost/lifetime Dth = ((8) + (20)-(7b)) / (17)	$8.72	$11.09	$10.86	$10.65	$10.83
22b)	Benefit-Cost Ratio = (18b) / (8) + (20)	1.83	1.61	1.66	1.67	1.65
23b)	Utility Spending per lifetime Dth = ((6)+ (7b)) / (17)	$6.98	$9.03	$8.60	$8.28	$8.57
Line	**Notes:**					
15a & 15b	3YP is projected at a portfolio level therefore the split between residential and C&I charges is based of 2021 Annual Plan and will be updated in subsequent Annual Plans.					
21-26	21-26a reflects benefit/cost using the RI Test and 21-26b reflects benefit/cost using the TRC Test.					

Three-Year Plan Attachment 2. Program Level Benefit Cost Summary

Attachment 2 Table 1. 2021 Electric Programs Benefit Cost Summary

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2021 RHODE ISLAND BENEFIT COST TEST
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	6.24	$58,649.1	$8,500.17	$893.1	
Large Commercial Retrofit	7.52	$329,117.0	$31,930.24	$11,821.8	
Small Business Direct Install	3.35	$36,190.8	$8,883.56	$1,922.8	
Commercial ConnectedSolutions	9.85	$29,465.0	$2,990.11	$0.0	
Community Based Initiatives - C&I			$74.53		
Commercial Pilots			$0.00		
Finance Costs			$5,000.00		
Commercial Workforce Development			$468.69		
C&I SUBTOTAL	**6.05**	**$453,421.9**	**$57,847.3**	**$14,637.7**	**$2,475.0**
Income Eligible					
Income Eligible Single Family	2.65	$36,501.8	$13,759.32	$0.0	
Income Eligible Multi Family	1.76	$8,502.4	$4,830.80	$0.0	
Income Eligible Workforce Development			$114.19		
Income Eligible Residential SUBTOTAL	**2.27**	**$45,004.2**	**$18,704.3**	**$0.0**	**$1,100.0**
Residential Programs					
Residential New Construction	2.69	$6,445.3	$1,544.34	$855.7	
ENERGY STAR® HVAC	2.77	$13,306.5	$3,487.80	$1,311.6	
EnergyWise	1.89	$33,615.8	$17,033.34	$790.4	
Multi Family	2.44	$8,756.5	$3,056.84	$532.0	
Home Energy Reports	3.23	$8,530.8	$2,641.68	$0.0	
ENERGY STAR® Lighting	3.29	$14,018.2	$5,274.75	-$1,012.9	
Residential Consumer Products	2.84	$11,372.7	$2,681.24	$1,321.2	
Residential ConnectedSolutions	6.13	$12,018.6	$1,959.72	$0.0	
Energy Efficiency Education			$40.00		
Community Based Initiatives - Residential			$226.16		
Residential Pilots			$0.00		
Comprehensive Marketing - Residential			$332.71		
Residential Workforce Development			$284.72		
Non-Income Eligible Residential SUBTOTAL	**2.44**	**$108,064.5**	**$38,563.3**	**$3,798.1**	**$1,925.0**
OER			$845.56		
EERMC			$845.56		
TOTAL	**4.31**	**$606,490.7**	**$116,806.0**	**$18,435.8**	**$5,500.0**

Attachment 2 Table 2. 2022 Electric Programs Benefit Cost Summary – Base Case

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2022 RHODE ISLAND BENEFIT COST TEST – BASE CASE
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	6.02	$65,945.8	$9,845.9	$1,111.4	
Large Commercial Retrofit	5.93	$360,199.2	$44,260.5	$16,430.7	
Small Business Direct Install	3.48	$36,058.5	$8,548.6	$1,811.5	
Commercial ConnectedSolutions	9.90	$34,981.4	$3,534.4	$0.0	
Community Based Initiatives - C&I			$85.0		
Commercial Pilots			$0.0		
Finance Costs			$5,000.0		
Commercial Workforce Development			$544.6		
C&I SUBTOTAL	**5.31**	**$497,185.0**	**$71,819.0**	**$19,353.6**	**$2,475.0**
Income Eligible					
Income Eligible Single Family	2.67	$40,243.8	$15,099.5	$0.0	
Income Eligible Multi Family	1.83	$7,715.5	$4,214.1	$0.0	
Income Eligible Workforce Development			$156.2		
Income Eligible Residential SUBTOTAL	**2.33**	**$47,959.4**	**$19,469.7**	**$0.0**	**$1,100.0**
Residential Programs					
Residential New Construction	2.87	$6,408.7	$1,419.5	$812.8	
ENERGY STAR® HVAC	2.84	$17,605.1	$4,638.3	$1,560.3	
EnergyWise	1.92	$35,700.9	$18,008.7	$585.4	
Multi Family	2.39	$9,368.7	$3,581.3	$332.0	
Home Energy Reports	1.62	$8,360.3	$2,624.0	$2,540.7	
ENERGY STAR® Lighting	N/A	$0.0	$0.0	$0.0	
Residential Consumer Products	2.88	$12,053.8	$2,851.9	$1,340.1	
Residential ConnectedSolutions	7.40	$18,715.0	$2,527.4	$0.0	
Energy Efficiency Education			$40.0		
Community Based Initiatives - Residential			$257.5		
Residential Pilots			$0.0		
Comprehensive Marketing - Residential			$507.7		
Residential Workforce Development			$246.1		
Non-Income Eligible Residential SUBTOTAL	**2.36**	**$108,212.5**	**$36,702.4**	**$7,171.4**	**$1,925.0**
OER			$1,188.4		
EERMC			$1,188.4		
TOTAL	**4.02**	**$653,356.8**	**$130,367.9**	**$26,525.0**	**$5,500.0**

Attachment 2 Table 3. 2022 Electric Programs Benefit Cost Summary – High Scenario

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2022 RHODE ISLAND BENEFIT COST TEST – HIGH SCENARIO
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	6.02	$69,243.1	$10,338.2	$1,167.0	
Large Commercial Retrofit	5.96	$379,636.2	$46,473.5	$17,252.2	
Small Business Direct Install	3.48	$37,861.5	$8,976.1	$1,902.1	
Commercial ConnectedSolutions	9.90	$47,224.9	$4,771.4	$0.0	
Community Based Initiatives - C&I			$89.2		
Commercial Pilots			$0.0		
Finance Costs			$5,250.0		
Commercial Workforce Development			$571.9		
C&I SUBTOTAL	**5.38**	**$533,965.7**	**$76,470.2**	**$20,321.2**	**$2,475.0**
Income Eligible					
Income Eligible Single Family	2.67	$42,256.0	$15,854.4	$0.0	
Income Eligible Multi Family	1.83	$8,101.3	$4,424.8	$0.0	
Income Eligible Workforce Development			$164.0		
Income Eligible Residential SUBTOTAL	**2.34**	**$50,357.3**	**$20,443.2**	**$0.0**	**$1,100.0**
Residential Programs					
Residential New Construction	2.87	$6,729.1	$1,490.5	$853.4	
ENERGY STAR® HVAC	2.84	$18,485.4	$4,870.3	$1,638.3	
EnergyWise	1.92	$37,486.0	$18,909.1	$614.7	
Multi Family	2.39	$9,837.1	$3,760.4	$348.6	
Home Energy Reports	1.62	$8,360.3	$2,624.0	$2,540.7	
ENERGY STAR® Lighting	N/A	$0.0	$0.0	$0.0	
Residential Consumer Products	2.88	$12,656.5	$2,994.5	$1,407.2	
Residential ConnectedSolutions	7.40	$18,715.0	$2,527.4	$0.0	
Energy Efficiency Education			$42.0		
Community Based Initiatives - Residential			$270.3		
Residential Pilots			$0.0		
Comprehensive Marketing - Residential			$533.1		
Residential Workforce Development			$258.4		
Non-Income Eligible Residential SUBTOTAL	**2.36**	**$112,269.4**	**$38,279.9**	**$7,402.9**	**$1,925.0**
OER			$1,247.9		
EERMC			$1,247.9		
TOTAL	**4.08**	**$696,592.4**	**$137,689.1**	**$27,724.2**	**$5,500.0**

Attachment 2 Table 4. 2023 Electric Programs Benefit Cost Summary – Base Case

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2023 RHODE ISLAND BENEFIT COST TEST – BASE CASE
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.90	$58,831.6	$8,962.7	$1,004.6	
Large Commercial Retrofit	6.23	$404,700.2	$47,649.2	$17,355.9	
Small Business Direct Install	3.49	$39,102.9	$9,225.9	$1,969.8	
Commercial ConnectedSolutions	9.83	$40,431.6	$4,111.5	$0.0	
Community Based Initiatives - C&I			$93.5		
Commercial Pilots			$0.0		
Finance Costs			$5,000.0		
Commercial Workforce Development			$581.0		
C&I SUBTOTAL	**5.52**	**$543,066.4**	**$75,623.8**	**$20,330.3**	**$2,475.0**
Income Eligible					
Income Eligible Single Family	2.68	$44,619.3	$16,622.3	$0.0	
Income Eligible Multi Family	1.76	$8,009.3	$4,557.5	$0.0	
Income Eligible Workforce Development			$172.8		
Income Eligible Residential SUBTOTAL	**2.34**	**$52,628.6**	**$21,352.5**	**$0.0**	**$1,100.0**
Residential Programs					
Residential New Construction	2.93	$6,919.4	$1,502.7	$860.2	
ENERGY STAR® HVAC	3.04	$21,610.2	$6,038.1	$1,064.5	
EnergyWise	1.91	$43,071.3	$21,716.3	$778.3	
Multi Family	2.35	$9,056.7	$3,523.5	$332.0	
Home Energy Reports	1.62	$8,349.1	$2,624.0	$2,540.7	
ENERGY STAR® Lighting	N/A	$0.0	$0.0	$0.0	
Residential Consumer Products	2.93	$15,971.5	$3,613.4	$1,830.9	
Residential ConnectedSolutions	8.50	$26,059.7	$3,064.8	$0.0	
Energy Efficiency Education			$40.0		
Community Based Initiatives - Residential			$283.0		
Residential Pilots			$0.0		
Comprehensive Marketing - Residential			$507.7		
Residential Workforce Development			$303.8		
Non-Income Eligible Residential SUBTOTAL	**2.49**	**$131,037.8**	**$43,217.3**	**$7,406.7**	**$1,925.0**
OER			$1,355.4		
EERMC			$1,355.4		
TOTAL	**4.13**	**$726,732.8**	**$142,904.5**	**$27,737.0**	**$5,500.0**

Attachment 2 Table 5. 2023 Electric Programs Benefit Cost Summary – High Scenario

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2023 RHODE ISLAND BENEFIT COST TEST – HIGH SCENARIO
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.90	$66,009.1	$10,056.2	$1,127.1	
Large Commercial Retrofit	6.26	$456,852.9	$53,462.4	$19,473.4	
Small Business Direct Install	3.49	$43,873.5	$10,351.5	$2,210.1	
Commercial ConnectedSolutions	9.83	$62,115.1	$6,316.5	$0.0	
Community Based Initiatives - C&I			$104.9		
Commercial Pilots			$0.0		
Finance Costs			$5,610.0		
Commercial Workforce Development			$651.9		
C&I SUBTOTAL	**5.62**	**$628,850.6**	**$86,553.3**	**$22,810.6**	**$2,475.0**
Income Eligible					
Income Eligible Single Family	2.68	$50,062.9	$18,650.2	$0.0	
Income Eligible Multi Family	1.76	$8,986.4	$5,113.5	$0.0	
Income Eligible Workforce Development			$193.9		
Income Eligible Residential SUBTOTAL	**2.36**	**$59,049.3**	**$23,957.6**	**$0.0**	**$1,100.0**
Residential Programs					
Residential New Construction	2.93	$7,763.6	$1,686.1	$965.2	
ENERGY STAR® HVAC	3.04	$24,246.7	$6,774.8	$1,194.4	
EnergyWise	1.91	$48,326.0	$24,365.7	$873.3	
Multi Family	2.35	$10,161.6	$3,953.3	$372.5	
Home Energy Reports	1.62	$8,349.1	$2,624.0	$2,540.7	
ENERGY STAR® Lighting	N/A	$0.0	$0.0	$0.0	
Residential Consumer Products	2.93	$17,920.0	$4,054.2	$2,054.3	
Residential ConnectedSolutions	8.50	$26,059.7	$3,064.8	$0.0	
Energy Efficiency Education			$44.9		
Community Based Initiatives - Residential			$317.5		
Residential Pilots			$0.0		
Comprehensive Marketing - Residential			$569.6		
Residential Workforce Development			$340.8		
Non-Income Eligible Residential SUBTOTAL	**2.47**	**$142,826.6**	**$47,795.8**	**$8,000.3**	**$1,925.0**
OER			$1,520.8		
EERMC			$1,520.8		
TOTAL	**4.20**	**$830,726.4**	**$161,348.3**	**$30,810.9**	**$5,500.0**

Attachment 2 Table 6. 2021 Natural Gas Programs Benefit Cost Summary

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2021 RHODE ISLAND BENEFIT COST TEST

Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	4.86	$12,599.7	$2,759.2	-$166.4	
Large Commercial Retrofit	5.27	$45,068.7	$5,169.1	$3,387.0	
Small Business Direct Install	3.83	$1,539.9	$332.7	$69.4	
Commercial & Industrial Multifamily	4.75	$4,922.8	$953.2	$84.0	
Comprehensive Marketing - Commercial and Industrial			$0.0		
Commercial Pilots			$215.8		
Community Based Initiatives - C&I			$24.8		
Finance Costs			$0.0		
Commercial Workforce Development			$164.5		
Commercial & Industrial Subtotal	**4.69**	**$64,131.1**	**$9,619.3**	**$3,374.0**	**$680.0**
Income Eligible Programs					
Single Family - Income Eligible Services	2.94	$19,830.4	$6,738.8	$0.0	
Income Eligible Multifamily	4.21	$13,690.7	$3,254.1	$0.0	
Income Eligible Workforce Development			$49.6		
Income Eligible Residential Subtotal	**3.20**	**$33,521.1**	**$10,042.5**	**$0.0**	**$425.0**
Residential Programs					
Energy Star® HVAC	1.66	$13,615.7	$3,673.0	$4,539.3	
EnergyWise	2.01	$21,873.6	$10,063.2	$816.5	
EnergyWise Multifamily	4.70	$8,630.2	$1,491.6	$344.0	
Home Energy Reports	4.05	$1,825.1	$450.9	$0.0	
Residential New Construction	1.02	$1,378.3	$674.8	$670.9	
Comprehensive Marketing - Residential			$64.8		
Residential Pilots			$0.0		
Community Based Initiatives - Residential			$75.8		
Residential Workforce Development			$118.3		
Non-Income Eligible Residential Subtotal	**2.01**	**$47,322.9**	**$16,612.4**	**$6,370.8**	**$595.0**
EERMC			$321.2		
OER			$321.2		
Grand Total	**3.00**	**$144,975.1**	**$36,916.6**	**$9,744.8**	**$1,700.0**

Attachment 2 Table 7. 2022 Natural Gas Programs Benefit Cost Summary – Base Case

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2022 RHODE ISLAND BENEFIT COST TEST – BASE CASE
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.52	$15,640.5	$3,015.9	-$184.0	
Large Commercial Retrofit	5.52	$47,717.7	$5,263.0	$3,383.9	
Small Business Direct Install	3.33	$2,548.0	$629.4	$136.5	
Commercial & Industrial Multifamily	4.56	$5,066.7	$1,026.8	$84.0	
Comprehensive Marketing - Commercial and Industrial			$0.0		
Commercial Pilots			$219.0		
Community Based Initiatives - C&I			$28.3		
Finance Costs			$0.0		
Commercial Workforce Development			$55.6		
Commercial & Industrial Subtotal	**4.95**	**$70,972.9**	**$10,238.0**	**$3,420.4**	**$680.0**
Income Eligible Programs					
Single Family - Income Eligible Services	2.95	$21,786.3	$7,378.1	$0.0	
Income Eligible Multifamily	4.24	$13,653.9	$3,223.6	$0.0	
Income Eligible Workforce Development			$84.4		
Income Eligible Residential Subtotal	**3.19**	**$35,440.3**	**$10,686.1**	**$0.0**	**$425.0**
Residential Programs					
Energy Star® HVAC	1.66	$17,385.5	$4,568.0	$5,924.8	
EnergyWise	2.03	$22,169.7	$10,005.8	$903.1	
EnergyWise Multifamily	4.71	$8,629.1	$1,487.0	$344.0	
Home Energy Reports	4.10	$1,807.3	$441.3	$0.0	
Residential New Construction	1.10	$1,292.4	$609.6	$562.0	
Comprehensive Marketing - Residential			$79.8		
Residential Pilots			$0.0		
Community Based Initiatives - Residential			$86.3		
Residential Workforce Development			$137.3		
Non-Income Eligible Residential Subtotal	**1.99**	**$51,284.0**	**$17,414.9**	**$7,733.9**	**$595.0**
EERMC			$400.0		
OER			$400.0		
Grand Total	**3.03**	**$157,697.1**	**$39,139.2**	**$11,154.3**	**$1,700.0**

Attachment 2 Table 8. 2022 Natural Gas Programs Benefit Cost Summary – High Scenario

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2022 RHODE ISLAND BENEFIT COST TEST – HIGH SCENARIO
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.52	$17,986.6	$3,468.2	-$211.6	
Large Commercial Retrofit	5.52	$54,875.3	$6,052.5	$3,891.5	
Small Business Direct Install	3.33	$2,930.2	$723.9	$156.9	
Commercial & Industrial Multifamily	4.56	$5,826.7	$1,180.8	$96.6	
Comprehensive Marketing - Commercial and Industrial			$0.0		
Commercial Pilots			$251.9		
Community Based Initiatives - C&I			$32.6		
Finance Costs			$0.0		
Commercial Workforce Development			$63.9		
Commercial & Industrial Subtotal	**4.98**	**$81,618.8**	**$11,773.7**	**$3,933.5**	**$680.0**
Income Eligible Programs					
Single Family - Income Eligible Services	2.95	$25,054.3	$8,484.8	$0.0	
Income Eligible Multifamily	4.24	$15,702.0	$3,707.1	$0.0	
Income Eligible Workforce Development			$97.1		
Income Eligible Residential Subtotal	**3.21**	**$40,756.3**	**$12,289.0**	**$0.0**	**$425.0**
Residential Programs					
Energy Star® HVAC	1.66	$19,993.4	$5,253.2	$6,813.6	
EnergyWise	2.03	$25,495.1	$11,506.6	$1,038.5	
EnergyWise Multifamily	4.71	$9,923.4	$1,710.0	$395.6	
Home Energy Reports	4.10	$1,807.3	$441.3	$0.0	
Residential New Construction	1.10	$1,486.3	$701.0	$646.3	
Comprehensive Marketing - Residential			$91.7		
Residential Pilots			$0.0		
Community Based Initiatives - Residential			$99.2		
Residential Workforce Development			$157.9		
Non-Income Eligible Residential Subtotal	**1.99**	**$58,705.5**	**$19,961.0**	**$8,894.0**	**$595.0**
EERMC			$460.1		
OER			$460.1		
Grand Total	**3.04**	**$181,080.6**	**$44,943.9**	**$12,827.4**	**$1,700.0**

Attachment 2 Table 9. 2023 Natural Gas Programs Benefit Cost Summary – Base Case

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2023 RHODE ISLAND BENEFIT COST TEST – BASE CASE
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.62	$17,025.6	$3,237.6	-$205.7	
Large Commercial Retrofit	5.73	$61,704.8	$6,281.9	$4,495.1	
Small Business Direct Install	3.23	$3,789.2	$957.3	$217.2	
Commercial & Industrial Multifamily	4.60	$5,051.0	$1,015.2	$84.0	
Comprehensive Marketing - Commercial and Industrial			$0.0		
Commercial Pilots			$222.3		
Community Based Initiatives - C&I			$31.2		
Finance Costs			$0.0		
Commercial Workforce Development			$70.1		
Commercial & Industrial Subtotal	**5.13**	**$87,570.6**	**$11,815.6**	**$4,590.6**	**$680.0**
Income Eligible Programs					
Single Family - Income Eligible Services	2.97	$23,938.6	$8,069.4	$0.0	
Income Eligible Multifamily	4.25	$13,651.0	$3,213.7	$0.0	
Income Eligible Workforce Development			$90.2		
Income Eligible Residential Subtotal	**3.19**	**$37,589.6**	**$11,373.3**	**$0.0**	**$425.0**
Residential Programs					
Energy Star® HVAC	1.68	$21,218.1	$5,695.9	$6,937.3	
EnergyWise	1.98	$29,030.1	$13,398.1	$1,239.3	
EnergyWise Multifamily	4.72	$8,629.1	$1,482.3	$344.0	
Home Energy Reports	4.10	$1,807.8	$441.3	$0.0	
Residential New Construction	1.03	$1,225.3	$611.8	$580.3	
Comprehensive Marketing - Residential			$79.8		
Residential Pilots			$0.0		
Community Based Initiatives - Residential			$94.8		
Residential Workforce Development			$176.9		
Non-Income Eligible Residential Subtotal	**1.95**	**$61,910.3**	**$21,980.9**	**$9,100.9**	**$595.0**
EERMC			$468.4		
OER			$468.4		
Grand Total	**3.04**	**$187,070.5**	**$46,106.6**	**$13,691.5**	**$1,700.0**

Attachment 2 Table 10. 2023 Natural Gas Programs Benefit Cost Summary – High Scenario

THE NARRAGANSETT ELECTRIC COMPANY d/b/a NATIONAL GRID

2023 RHODE ISLAND BENEFIT COST TEST – HIGH SCENARIO
Summary of Benefit, Expenses, Evaluation Costs ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Illustrative Shareholder Incentive
Large Commercial & Industrial					
Large Commercial New Construction	5.62	$21,346.4	$4,059.3	-$257.9	
Large Commercial Retrofit	5.73	$77,364.2	$7,876.1	$5,635.8	
Small Business Direct Install	3.23	$4,750.8	$1,200.3	$272.3	
Commercial & Industrial Multifamily	4.60	$6,332.8	$1,272.9	$105.3	
Comprehensive Marketing - Commercial and Industrial			$0.0		
Commercial Pilots			$278.7		
Community Based Initiatives - C&I			$39.1		
Finance Costs			$0.0		
Commercial Workforce Development			$87.9		
Commercial & Industrial Subtotal	**5.17**	**$109,794.2**	**$14,814.2**	**$5,755.6**	**$680.0**
Income Eligible Programs					
Single Family - Income Eligible Services	2.97	$30,013.7	$10,117.3	$0.0	
Income Eligible Multifamily	4.25	$17,115.4	$4,029.2	$0.0	
Income Eligible Workforce Development			$113.1		
Income Eligible Residential Subtotal	**3.21**	**$47,129.1**	**$14,259.6**	**$0.0**	**$425.0**
Residential Programs					
Energy Star® HVAC	1.68	$26,602.8	$7,141.4	$8,697.8	
EnergyWise	1.98	$36,397.3	$16,798.3	$1,553.8	
EnergyWise Multifamily	4.72	$10,818.9	$1,858.5	$431.3	
Home Energy Reports	4.10	$1,807.8	$441.3	$0.0	
Residential New Construction	1.03	$1,536.2	$767.1	$727.6	
Comprehensive Marketing - Residential			$100.0		
Residential Pilots			$0.0		
Community Based Initiatives - Residential			$118.8		
Residential Workforce Development			$221.8		
Non-Income Eligible Residential Subtotal	**1.96**	**$77,163.1**	**$27,447.2**	**$11,410.5**	**$595.0**
EERMC			$587.2		
OER			$587.2		
Grand Total	**3.06**	**$234,086.4**	**$57,695.5**	**$17,166.1**	**$1,700.0**

Three-Year Plan Attachment 3. Definitions

This attachment provides a reference to commonly used terms in the Three-Year and Annual Energy Efficiency Plans.

Assessment

An assessment will be deployed for solutions that address a particular gap or program need, but have significant uncertainty around the effectiveness or potential of the solution to realize savings. Because of the uncertainty, assessments will not include field demonstrations or customer installations. Instead, assessments will focus on information gathering to equip Company staff to make a more informed decision of whether and how to proceed with the idea. It is possible that an assessment could recommend further demonstration of the idea or determine the solution should exit the review process. Savings associated with assessments may not contribute to shareholder incentives. Assessments may be evaluated with an independent evaluation, vendor evaluation, or internal review.

Customer Contribution/Customer Cost

The financial cost of a measure and/or service that is not covered by the customer incentive.

Customer Incentive

Financial support and/or services (e.g., rebates, on-bill repayment) provided to participants in attempt to motivate the installation of measures and/or changes in behavior to achieve energy savings.

On-Bill Repayment (OBR)

A financial mechanism that allows customers to pay back the customer contribution/customer cost of a measure and/or service on their energy bill.

Demand Response

Active Demand Response: The reduction or shifting of energy use by customers during peak periods or events when the load on the electric grid or gas distribution system is high.

Passive Demand Response: Energy efficiency measures that permanently shift or reduce electricity use at all times, contributing to a reduction of peak load.

Demonstration

A demonstration will test the feasibility of a new product or offering for inclusion in existing programs. It is generally expected that demonstrations will be less time and resource intensive than pilots, since generally there is greater certainty around a narrow, incremental idea added to a program rather than a totally new set of offerings. Savings associated with demonstration projects may contribute to shareholder incentives. Demonstrations may be evaluated with either an independent or a vendor evaluation.

Evaluation

Independent Evaluation: An independent evaluation uses a third-party evaluation vendor selected via a competitive Request for Proposals process for the specified evaluation or selected in the recent past for

evaluation services of efficiency programs. An independent evaluation can be both a process and an impact evaluation.

Vendor Evaluation: A vendor evaluation is conducted by a vendor installing a technology, measure, strategy, or solution. A vendor evaluation can also be conducted by a Technical Assistance vendor who conducts a savings analysis for the installed technology, measure, or an energy saving strategy. A vendor evaluation can only be an impact evaluation.

Goals

Goals refer to National Grid's three-year energy efficiency savings goals.

Market Potential Study

A Market Potential Studymarket potential study is a detailed assessment of the energy efficiency potential in given market. In this Plan, the term is used in reference to the 2020 Rhode Island Energy Efficiency Market Potential Study.

Non-Energy Impacts

Non-energy impacts (NEIs) are those other than the energy and demand savings generated by efficiency programs. Non-energy impacts accrue to program participants (e.g. increased comfort and health, improved property values), society at large (e.g. greenhouse gas reductions, improved air quality), and the utility system (e.g. Reduced arrearages).

Non-Participant

A customer that does not directly participate in an efficiency program.

Participant

A customer that reduces or otherwise modifies their energy end use patterns due to involvement in an efficiency program. Participation is measured differently in different programs. For several programs, a participant is defined as a customer account (electric or gas). In contrast, the Residential Consumer Products program measures participation by the number of rebates processed.

Pilots

A pilot is a small scale, targeted program that is limited in scope, time, and spending and is designed to test the feasibility of a future program or rate design. It is incumbent upon the proponent of a pilot to define these limits in a proposal for PUC review. Ideally, a pilot can provide net benefits and achieve goals, but the primary design and value of a pilot is to test rather than to achieve. Pilots are designed to explore technologies and approaches to energy management not included in the core energy efficiency programs (Residential, Commercial and Industrial, and Multifamily) and that could potentially become a new, standalone program.

Pilots enable the Company to test technologies, new energy management strategies, customer adoption, workforce adoption, and cost effectiveness of emerging and new technologies. While pilots are designed to test standalone programs, pilot results may conclude that a standalone program is not recommended or that certain aspects of the pilot should be offered within existing programs. It is likely

that pilots will require a long-term commitment and broader set of stakeholder input, given the scope of adding a new core program to the Company portfolio. Savings associated with Pilots will not contribute to shareholder incentives. Pilots may be evaluated with either an independent or a vendor evaluation.

Portfolio

A collection of programs. The electric portfolio contains programs that primarily focus on delivering electricity savings and the natural gas portfolio contains programs that primarily focus on delivering natural gas savings. A portfolio is required to be cost-effective.

Program

A collection of defined services and/or measures carried out by National Grid and/or its vendors and subcontractors that: target a specific market segment, customer class, or defined end use; are designed to influence customer behavior to achieve changes in energy usage, equipment preferences, investment, and maintenance practices; and are guided by a specific savings goal and have a benefit-cost ratio. Programs are typically made up of the following categories that contribute to the overall program savings goals and benefit-cost ratios.

Sub-Program

Within the Commercial and Industrial Sector, a sub-program is a further grouping of measures within a program. An example is the upstream lighting sub-program within the Commercial and Industrial Sector.

Measure

A piece of equipment or customer action that reduces or otherwise modifies energy end use patterns. This is the most granular level of categorization. For example, an LED light bulb.

Comprehensive Measures: When a customer employs multiple pieces of equipment or actions that reduce or otherwise modify energy use at the same time, more fully taking advantage of energy savings opportunities at one time rather than completing piecemeal projects.

Measure Group

A group of measures with similar characteristics within a program. For example, the measure group LED in the Residential lighting program includes several types of LED light bulbs and the Compressed Air measure group within the Large Commercial New Construction program contains all the compressed air measures within that program.

Services

A range of activities to support customer awareness, education, and adoption of energy saving and energy modification opportunities including free technical assistance, training, analysis, and reports.

Initiative

A "go to market" strategy within a program that promotes a subset of measures or services within that program and/or targets a certain segment of customers. For example, the Grocery Initiative within the Large Commercial and Industrial Retrofit Program.

Assessment

Demonstration

Performance Incentive

A financial incentive that the Company has an opportunity to earn based on performance in fulfilling the savings goals of the approved Annual Plan. The Performance Incentive is authorized and established through Annual Energy Efficiency Plans by R.I. Gen. Laws § 39-1-27.7(e) and § 39-1-27.7.1.

Rebate

A financial incentive paid to a participant in order to obtain a specific action, typically the installation of equipment. A rebate can also be paid to manufacturers and suppliers of measures to lower the price at the point of sale to the customer.

Savings

Annual Savings: Energy savings accrued annually from the installed measure(s).

Lifetime Savings: Energy savings accrued over the functional lifetime of the installed measure(s).

Sector

A grouping of participants by customer rate class. Programs are organized by these groupings. There are three sectors: Residential, Income-Eligible, and Commercial and Industrial.

Targets

Targets refer to the three-year energy efficiency savings targets approved by the PUC.

Technical Assistance (TA) Study

A technical assistance study assesses a measure or group of measures for savings and costs and is performed by a third-party technical assistance vendor. A TA study quantifies electric and gas savings, along with delivered fuel and non-energy impacts. TA studies include some or all of the following activities: facility benchmarking and/or walkthrough, equipment metering or analysis of building energy management system data, determination of measure baseline, engineering analysis of the operation of the baseline, and proposed measures and building energy simulations. The TA vendor performs a benefit-cost screening to assess the estimated payback for the customer along with the impact of costs and savings. A TA study report is presented to the customer which outlines the methodology followed to determine estimated project savings, cost, and project payback, along with the results of the study.

Technical Assessment

A technical assessment is engineering research conducted to determine the savings of a new technology or measure that may not be widely adopted in the market.

Schedule B
2021 Energy Efficiency Plan

STATE OF RHODE ISLAND

PUBLIC UTILITIES COMMISSION

In Re: The Narragansett Electric Company		
d/b/a National Grid		**Docket No. 5076**
Annual Energy Efficiency Plan for 2021		

ANNUAL ENERGY EFFICIENCY PLAN FOR 2021

October 15, 2020

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EXECUTIVE SUMMARY AND INTRODUCTION

2021 RHODE ISLAND ENERGY EFFICIENCY PLAN ROAD MAP

$751.4 Million in total lifetime benefits

ECONOMIC

Good Green Jobs

Supporting Economic Recovery

Delivering Energy Savings to Rhode Island

ENERGY SAVINGS

1.3 TWh lifetime electric savings

$121.2 million less than cost of purchasing electric supply

4.2 million MMBTU lifetime natural gas savings

$14.1 million less than cost of purchasing natural gas

INVESTMENT RESULTS

$341.8 million increase in Rhode Island Gross State Product

873.2 thousand tons of avoided carbon = **171,158** cars off the road

71% of companies delivering energy efficiency are based in Rhode Island

2. Introduction

The Narragansett Electric Company d/b/a National Grid (National Grid or the Company) submits this 2021 Annual Energy Efficiency and Conservation Procurement Plan (Plan or Annual Plan) as the first annual plan submitted alongside the fifth triennial plan (2021-2023 Three Year Energy Efficiency and Conservation Procurement Plan) in fulfillment of The Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006.

Energy efficiency is the most cost-effective way to supply new energy and meet customers' energy needs. Customers who directly participate in energy efficiency programs save energy and see direct cost savings in the form of lower energy bills. Energy efficiency also lowers long-term base load and peak demand and reduces the need for additional generation and transmission infrastructure, benefiting all customers, regardless of direct participation in the Company's efficiency programs. The purpose of the Annual Plan is to propose the programs the Company will deliver to help Rhode Island energy consumers meet their energy needs through cost effective, reliable, prudent, and environmentally responsible energy efficiency, and to identify their costs, benefits, and energy savings.

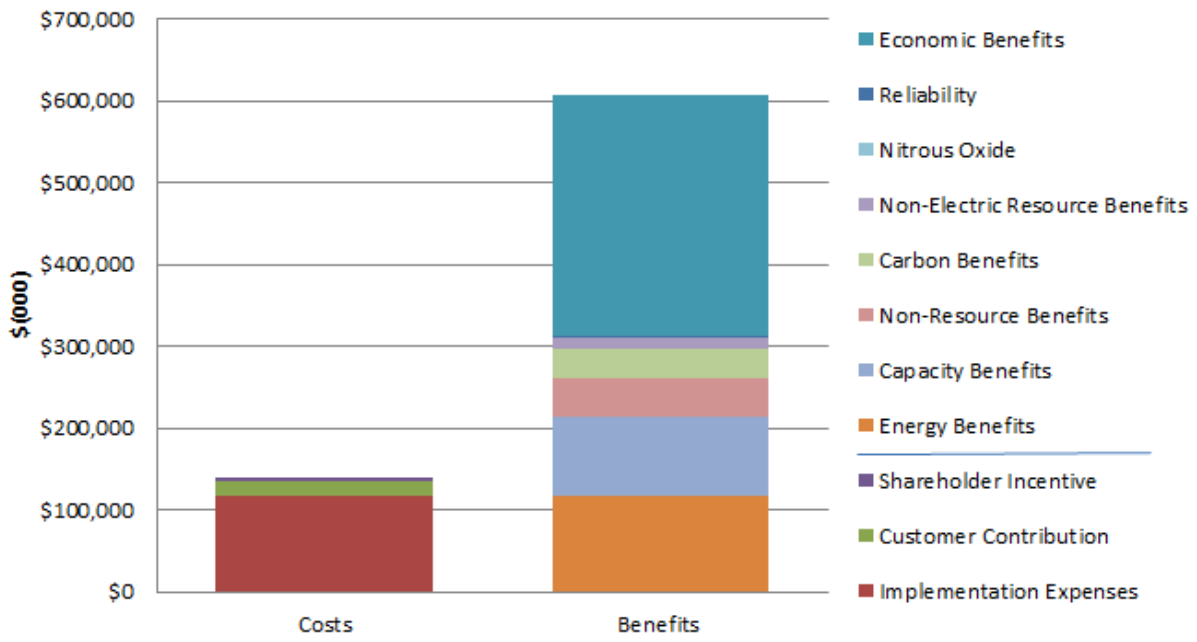
The Annual Plan identifies the energy savings goals for 2021 and describes the detailed strategies, programming, and investments the Company is undertaking to achieve these goals, while continuing to build the infrastructure needed to achieve the full savings and benefits outlined in the 2021 -2023 Three-Year Energy Efficiency Plan. In proposing this Plan, the Company is mindful of the prevailing economic conditions, including the uncertain impacts the COVID-19 pandemic will continue to have on the Rhode Island economy. The Company is also aware of the significant economic benefits that energy efficiency programming can offer towards recovery. To balance these factors, the Company set the investment budget for the 2021 year to ensure no increase of the systems benefit charge and has weighted investments toward helping those who may be hardest hit by the economic impacts, including low- and moderate-income customers and small businesses. The Company is also increasing investment in workforce development to mitigate the workforce losses due to COVID-19 and help bring new workers into growth areas of clean energy technologies. The planned programs and budgets attempt to maintain flexibility to ensure continued delivery of energy efficiency services and maintain and build clean energy jobs under multiple potential scenarios for the 2021 program year.

This Plan will create significant benefits for Rhode Island. In total, the Plan is expected to create $751,465,779 in total benefits over the life of the installed electric, demand response, and natural gas energy efficiency measures. Investments made in energy efficiency to achieve these savings will add $341,806,660 to Rhode Island's Gross State Product (GSP). The projected lifetime energy savings from this Plan will avoid 873,292 tons of carbon, the equivalent of removing 171,158 passenger vehicles from the road for one year. Energy savings and benefits are measured and verified by third-party evaluation firms.

The electric portion of the Plan will save 1,306,562 lifetime MWh over the lifetime of the installed energy efficiency measures, 139,478 net annual MWhs, and 22,723 net annual kW from passive energy

efficiency. The natural gas portion of the plan will save 4,206,444 lifetime MMBtu over the lifetime of installed natural gas measures and 425,359 annual MMBtu. For all fuels (electric, gas, oil, propane), combined the plan will save 8,577,361 net lifetime MMBtu and 854,337 net annual MMBtu.

Figure 1. 2021 Energy Efficiency Plan Costs Compared to Benefits



This 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 Least Cost Procurement Standards, as approved and adopted pursuant to Order No. 23890 in Docket No. 5015[1] (referred to herein as the "LCP Standards"). This Plan has been developed by National Grid with feedback provided by the Energy Efficiency Technical Working Group (EE TWG) and the Energy Efficiency and Resource Management Council (EERMC).[2]

---

[1] RI PUC Docket 5015, Least Cost Procurement Standards http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf

[2] Since 1991, a collaborative group has been meeting regularly to analyze and inform the Company's electric and gas energy efficiency programs. The name of this group was modified in 2019 to the Energy Efficiency Technical Working Group (EE TWG) to better reflect the roles of the parties. Presently, members of the EE TWG include: The Company, the Division of Public Utilities and Carriers (Division or DPUC) and the Division's consultant, Synapse Energy Economics (Synapse), the City of Providence, Green Energy Consumers Alliance, the Office of Energy Resources, and Acadia Center. In addition, the George Wiley Center, the Center for Justice, the Rhode (continued) Island Infrastructure Bank (RIIB), and several EERMC members and representatives from the EERMC's Consulting Team participate in the EE TWG. Since 1991, membership in the EE TWG has varied because some organizations have withdrawn, and others have joined. Further information available at: https://www.nationalgridus.com/ri-energy-efficiency-technical-working-group

The 2021 Plan satisfies the statutory requirements for Least Cost Procurement and the Least Cost Procurement Standards and is consistent with the concurrently filed Three-Year Energy Efficiency Procurement Plan (Three-Year Plan) for 2021-2023.[3] The overarching goal of both Plans is to enable Rhode Island energy consumers to meet their energy needs through cost-effective, reliable, prudent, and environmentally responsible energy efficiency.

Cost-Effective Savings

The primary goal of the Plan is to create energy and economic cost savings for Rhode Island consumers through energy efficiency. To that end, the electric-funded portion of the Plan will create electric and delivered fuels savings of 1,306,562 net lifetime MWhs, 139,478 net annual MWhs, and 22,723 net annual kW from passive energy efficiency. In addition, the Plan will generate savings of 39,339 net annual kW from active demand reduction measures. The natural gas-funded portion of the Plan will create savings of 4,206,444 net lifetime MMBtus and 425,359 net annual MMBtus. The Plan will generate total benefits of $751,465,779 over the life of the measures. Of these total benefits, $606,490,655 come from electric efficiency, passive demand reductions, and active demand response. $144,975,124 in benefits derive from natural gas efficiency. This adds up to significant benefits for Rhode Island's residential, commercial, industrial, and income eligible energy customers. The Annual Plan is cost-effective, with a cost that is lower than the cost of energy supply for both electricity and natural gas, satisfying the requirements prescribed in R.I. Gen. Laws § 39-1-27.7 (a)(2) and the Standards. The Plan also satisfies PUC Order No. 22851 by demonstrating how it advances the Docket 4600 principles and goals for the electric system detailed in Section 14.[4]

Table 1 includes a high-level summary of the Electric-funded and Natural Gas-funded portions of the Plan. Table 2 represents a more detailed table of the programs included under the "Active Demand Response (kW)" column shown in Table 1.

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[3] The Company intends to submit the Three-Year Plan to the PUC on October 15, 2020, at the same time this Annual Plan is filed.

[4] PUC Report and Order No. 22851 accepting the Stakeholder Report. Written Order issued July 31, 2017.

Table 1. 2021 Energy Efficiency and Demand Response Program Plan Summary

Electric Programs by Sector [3]	Implementation Spending ($000)[1]	Customer Contribution ($000)	Annual Savings (MWh)	Lifetime Savings (MWh)	Lifetime Savings (MMBtu) (Electric, Gas, Delivered Fuels)	¢/lifetime kWh	Summer Annual Demand Savings (kW) [5]	Active Demand Response (kW)	Total Benefits ($000)	RI Test B/C Ratio	Participants [6]
Non-Income Eligible Residential	$38,563	$3,798	53,062	196,358	1,198,321	21.6	7,528	5,739	$108,064	2.44	449,906
Income Eligible Residential [3]	$18,704	$0	5,387	71,068	499,734	26.3	557	N/A - Income Eligible customers can participate in all Non-Income Eligible Residential programs.	$45,004	2.27	8,430
Commercial and Industrial	$57,847	$14,638	81,029	1,039,136	2,672,861	7.0	14,638	33,600	$453,422	6.05	3,778
Regulatory	$1,691										
Subtotal	$116,806	$18,436	139,478	1,306,562	4,370,916	10.4	22,723	39,339	$606,491	4.31	462,114
Gas Programs by Sector	**Implementation Spending ($000)**	**Customer Contribution ($000)**	**Annual Savings (MMBtu)**	**Lifetime Savings (MMBtu)**	**Lifetime Savings (MMBtu) (Gas)**	**$/lifetime MMBtu**			**Total Benefits ($000)**	**RI Test B/C Ratio**	**Participants**
Non-Income Eligible Residential	$16,612	$6,371	168,933	1,544,017	1,544,017	14.89			$47,323	2.01	162,961
Income Eligible Residential	$10,042	$0	27,183	578,522	578,522	17.36			$33,521	3.20	4,661
Commercial and Industrial	$9,619	$3,374	229,243	2,083,905	2,083,905	6.22			$64,131	4.69	1,071
Regulatory [2]	$642										
Subtotal	$36,917	$9,745	425,359	4,206,444	4,206,444	11.09			$144,975	3.00	168,694
TOTAL Plan	**$153,723**	**$28,181**			**8,577,361**				**$751,466**	**3.99**	**630,808**

(1) Implementation spending does not include customer contributions, shareholder incentive, or commitments.

(2) Regulatory Includes contributions to the Office of Energy Resources and EERMC.

(3) In addition to Income Eligible Residential programs, Income Eligible customers can participate in all Non-Income Eligible Residential programs.

(4) Electric Programs are funded by the Electric Energy Efficiency Charge but also include Delivered Fuels energy savings.

(5) The Summer Annual Demand Response (kW) measures passive demand savings.

(6) The unit measure for participation varies by program. See Attachment 5, Table E-7 and Attachment 6, G-7 for participation goals by program.

Table 2. 2021 Active Demand Response Program Plan Summary

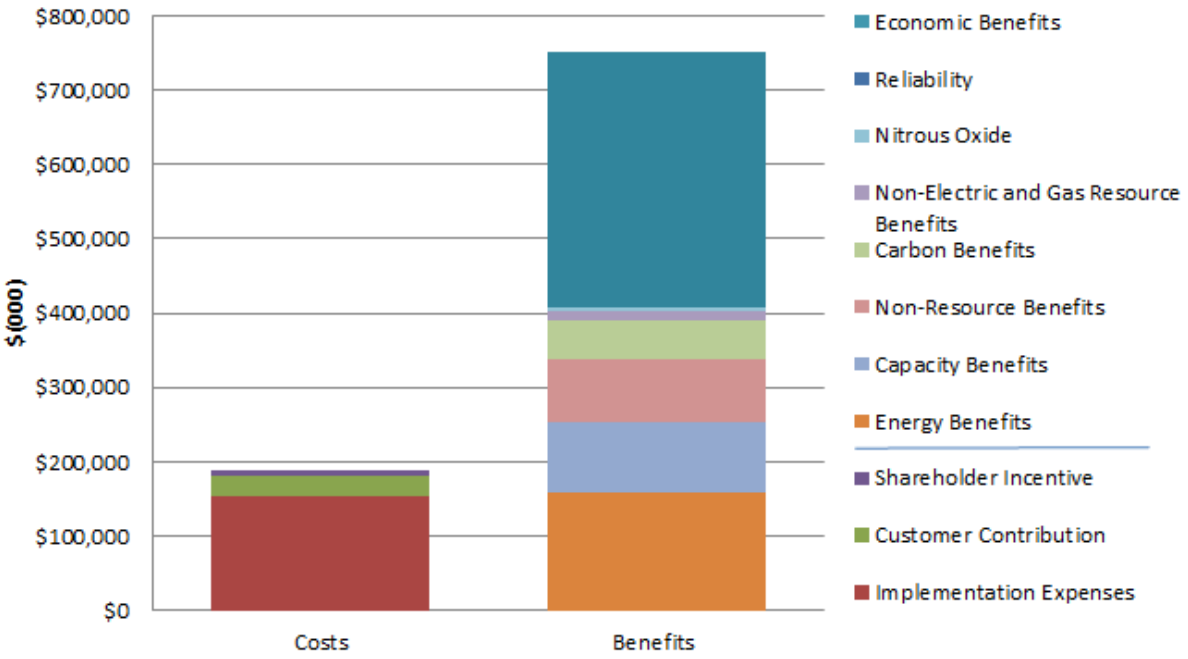
Programs	Implementation Spending ($000)	Customer Contribution	Active Demand	$/kw	Total Benefits	RI Test B/C	Participation
Residential	$1,960	$-	5,739	$341.49	$12,019	6.13	4,178
Commercial	$2,990	$-	33,600	$88.99	$29,465	9.85	180
Total	**$4,950**	$-	**39,339**	**$125.83**	**$41,484**	**8.38**	**4,358**

(1) All Residential electric customers (including Income Eligible customers) are eligible to participate in the Residential ConnectedSolutions program if they have the necessary equipment – a smart thermostat and central air conditioning, or a behind the meter battery.

Benefits of Investment in Energy Efficiency

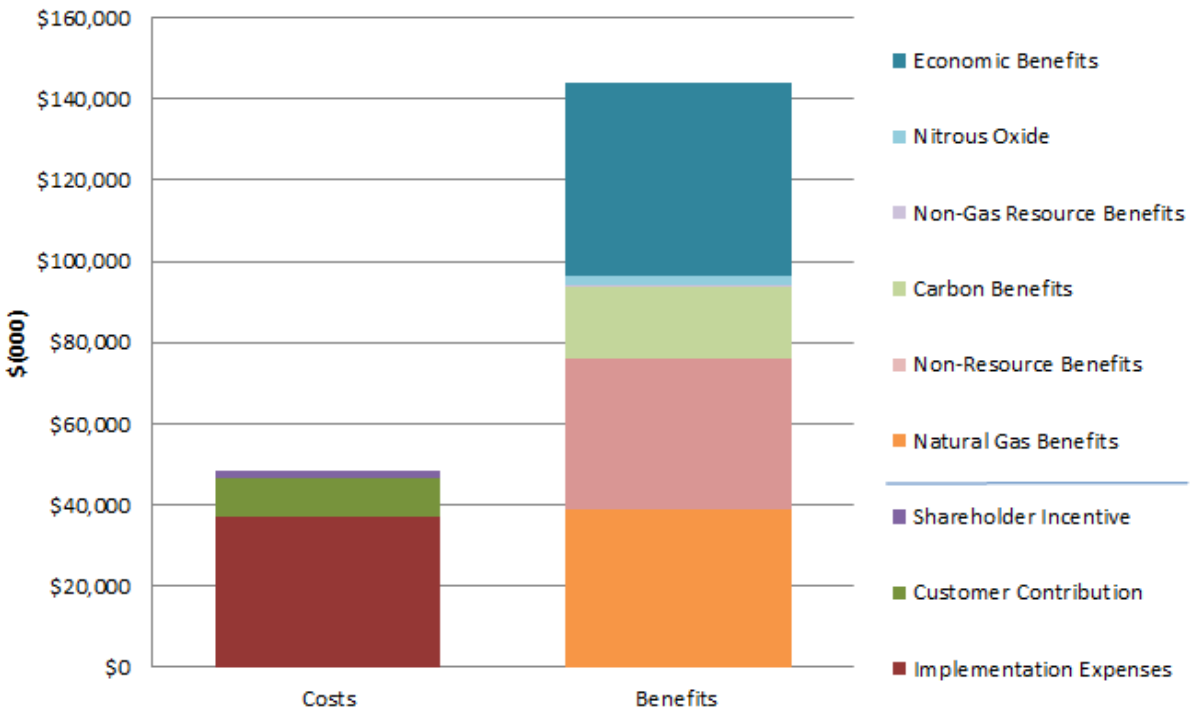
Each $1 spent on the electric energy efficiency portfolio will create $4.31 in benefits over the lifetime of the investment, and every $1 spent on the natural gas portfolio will create $3.00 in benefits over the lifetime of the investments. Figure 2 and Figure 3 below detail the costs and benefits for the electric and gas portfolios, respectively, calculated using the Rhode Island Test. A detailed summary of the benefits and costs included in the Rhode Island Test are included in Attachment 4 Rhode Island (RI) Benefit Cost Test.

Figure 2. Annual Plan Total Benefits and Total Costs (RI Test) for the Electric Portfolio[5]



[5] For more information on how and why these costs and benefits are calculated and included, see Attachment 4 Rhode Island Benefit Cost Test Description. For more information on the costs and expenses summarized here see Attachments 5 and 6.

Figure 3. Annual Plan Total Benefits and Total Costs (RI Test) for the Natural Gas Portfolio



The electric, gas, and delivered fuel energy efficiency measures proposed in this Plan will avoid over 873,292 tons of carbon.[6] This is the equivalent of removing approximately 171,158 passenger vehicles from the road for one year.[7]

The Company expects that investments made in energy efficiency under this Plan will add $341,806,660 to Rhode Island's Gross State Product (GSP).[8] The vast majority of jobs associated with the Annual Plan's energy efficiency investments are local because they are tied to the installation of equipment and materials. An analysis of National Grid's 2019 energy efficiency programs found that 71% of companies involved in the Company's energy efficiency programs are either headquartered or have a presence in Rhode Island.[9] Investments in energy efficiency contribute to Rhode Island's economy overall and benefit business owners and their employees who deliver these programs and services.

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[6] Takes into account the net impact of EE measures on carbon emissions. The marginal carbon emission rates are from "Avoided Energy Supply Components in New England: 2018 Report" Appendix K. pages 368-370.
[7] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
[8] Macroeconomic multipliers for the economic growth and job creation benefits of investing in cost-effective energy efficiency from "Review of RI Test and Proposed Methodology" prepared for National Grid by the Brattle Group, January 31, 2019.
[9] Peregrine Energy Group, "Analysis and Recommendations regarding the Current and Future Workforce associated with Rhode Island Energy Efficiency Programs," May 5, 2019 (filed as part of National Grid's 2018 Year-End Report).

The cost of procuring 1,306,562 net lifetime MWh electric energy efficiency savings through the Plan is $121,277,547 less than if that electric load was met by purchasing additional electric supply. The cost of procuring 4,206,444 MMBtu lifetime natural gas energy efficiency savings through the Plan is $14,186,986 less than if that natural gas load was met by purchasing additional natural gas supply.[10]

This Plan includes an investment of $122.3 million in the cost-effective electric energy efficiency portfolio in 2021. If approved, this will be funded by $16.0 million in proceeds from the ISO New England (ISO-NE) Forward Capacity Market (FCM), revenues from the existing energy efficiency program charge of $0.01323 per kWh, and revenues from a fully reconciling mechanism of $0.00000 per kWh pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5) to fully fund the cost-effective electric energy efficiency programs for 2021.[11]

This Plan also includes an investment of $38.6 million in the cost-effective natural gas energy efficiency portfolio in 2021. If approved, this investment will be funded by revenues from the existing energy efficiency program charge of $1.011 per dekatherm for residential customers and $0.704 per dekatherm for non-residential customers plus revenues from a fully reconciling mechanism of $0.000 per dekatherm for residential customers and $0.000 per dekatherm for non-residential customers pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5) to fully fund the cost-effective natural gas energy efficiency programs for 2021.[12]

The Planning Process and Major Changes

While many of the programs and strategies contained in this Annual Plan have a history of market traction and delivered savings, this Plan is distinct from prior annual and three-year plans. Both the 2021-2023 Three-Year Plan and this Annual Plan are delivered in a context that is new in three important respects.

First, both plans have benefited from and focused on the areas of opportunity identified in the Rhode Island Energy Efficiency Market Potential Study (Market Potential Study) commissioned by the EERMC and completed by Dunsky Energy Consulting in May 2020. The PUC codified the maximum potential identified by the study as the approved Targets in Docket 5023. In setting these Targets, the EERMC did not apply the filters of prudency and reliability that are required of the Company's proposed investments in energy efficiency.

Second, both Plans have been guided by a new set of LCP Standards, including an extensive set of "principles of program design" and a new accelerated timeline for concurrent filing of the Three-Year and Annual Plans, thereby eliminating any deviations between them.

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[10] For more information on how this was calculated, see Section 3 of the Main Text, "Cost of Annual Plan Compared to the Cost of Energy Supply"
[11] See Attachment 5 Electric EE Program Tables, Table E-1 for list of funding sources and calculation of the charge.
[12] See Attachment 6 Gas EE Program Tables, Table G-1 for list of funding sources and calculation of the charge.

Lastly, the Plans have been drafted as Rhode Island and the nation grapple with the COVID-19 pandemic and an evolving understanding of equity and the need for systemic change to achieve shared values of equity.

The 2021 Plan also marks a major milestone – the complete transformation of the residential lighting market and the final year incentives will be offered for residential lighting at the retail level. As the highly cost-efficient savings secured in previous plan cycles from lighting are reduced as a portion of program portfolio savings, the Company continues to seek new opportunities to drive deeper savings and transform additional markets. Consequently, this Plan focuses on building upon existing customer relationships to encourage comprehensive measures that accrue greater savings over their lifetime. Because these deeper and more comprehensive measures have higher upfront costs to secure the levels of claimable energy savings provided by lighting in previous plan cycles (i.e. they produce fewer savings per dollar invested), cost control and efficiency are key.

National Grid staff collaborated with the EERMC consultant team to identify measures from the Market Potential Study to inform the savings programs and strategies included in this Annual Plan. This has resulted in specific emphasis in program design on deeper measures of weatherization (insulation and air sealing), heating and hot water measures, particularly for residential and small business customers, and an increasing focus on combining sophisticated building and equipment controls alongside high potential measures offered to commercial and industrial customers. Building on the successes achieved through prior plans, this plan continues to expand active demand response programs.

The Company has engaged the TWG throughout the planning process to leverage their expertise and seek their feedback. In early 2020, TWG members were asked to identify their priorities for the next three years. TWG members also previewed and provided input on key themes and major changes in a Three-Year Plan Outline Memorandum circulated in April 2020 and reviewed and provided detailed feedback on the draft 2021-2023 Three-Year Plan and draft 2021 Annual Plan. The Company is grateful for the substantive critiques and innovative ideas that have come through this process of continued engagement. The Company has incorporated the priorities of TWG stakeholders into many components of this Annual Plan. The discussions of equity, in particular, have helped shape and elevate the Company's explicit equity commitments, establishing equity as an overarching strategic objective of this Annual Plan and adding multiple specific, measurable actions across the portfolio of efficiency programs. The Company looks forward to filing both the 2021 Annual Plan and 2021-2023 Three-Year Plan with the PUC in October.

How to Read This Plan

For ease of review, this Plan has been organized to align with the revised LCP Standards. There are three overarching sections: Strategies and Approaches to Planning; Consistency with Standards; and Funding Plan, Budget and Goals. The **Strategies and Approaches to Planning** section provides a detailed discussion of the Company's approach to implementing the principles of program design outlined in the LCP Standards and provides high-level program descriptions, along with the major enhancements and

innovations planned for 2021. This section also includes a discussion of program participation, pilots and demonstrations and assessments, evaluation, measurement and verification, and coordination with other energy programs. The **Consistency with Standards** section explains how the Plan meets Prudency (including a detailed discussion of equity and rate and bill impacts), Reliability, Environmentally Responsible, and Cost Effectiveness requirements, as set forth in the LCP Standards. **The Funding Plan, Budget and Goals** detail these elements and discusses the performance incentive plan and performance metrics.

The nine Attachments to this Annual Plan provide additional detail on specific Plan elements. **Attachment 1 Residential & IES Programs** and **Attachment 2 C&I Programs** provide detail on program eligibility criteria, offerings, implementation and delivery, customer feedback, 2021 changes with accompanying rationale, and proposed evaluations for each program. **Attachment 3 Evaluation, Measurement, and Verification Plan** reviews evaluation studies completed in 2020, details studies planned for 2021, and provides a recap of historical studies. **Attachment 4 RI Benefit Cost Test** presents the assessed cost-effectiveness of this Annual Plan. **Attachments 5 and 6** contain funding, budgets, goals, and cost-effectiveness tables for the electric and gas energy efficiency programs, respectively. **Attachment 7 Rate and Bill Impacts** provides a detailed analysis of the electric and gas bill impacts resulting from this Plan. **Attachment 8** details, for each sector, 2021 **Pilots, Demonstrations, and Assessments**. **Attachment 9 Cross-Program Summary** documents how the programs described in this Plan relate to other specific National Grid programs.

This Annual Plan is filed in combination with the 2021-2023 Three-Year Plan. The Three-Year Plan outlines the Company's overall programmatic focus and strategies, including illustrative and provisional budgets and savings goals for the three years of implementation. It lays out a vision for National Grid's continued transformation of the energy efficiency sector in Rhode Island, including key themes and areas of focus for 2021-2023. This Annual Plan solidifies that vision for the year 2021, formalizing budgets and savings goals associated with time tested programs, while outlining program enhancements and innovations planned for 2021, which will inform subsequent years of the implementation period.

STRATEGIES AND APPROACHES TO PLANNING

3. Programs and Priorities

3.1 Strategic Overview of Programs and Priorities

This Annual Plan is built as the first year of a new 2021-2023 Three-Year Energy Efficiency Plan, drafted and filed concurrently. The Three-Year Plan sets the Company on a trajectory to ensure that Rhode Island has a robust and resilient energy efficiency infrastructure, particularly as the market for energy efficiency transforms with changes in the lighting market. The Three-Year Plan and this Annual Plan will help continue the trajectory of Rhode Island homes and businesses towards greater efficiency, while maintaining considerations of the COVID-19 pandemic and its impacts on customers and economic conditions. The Plan seeks to guarantee that all Rhode Island energy consumers, regardless of their geographic location, income, home ownership status, primary language, business size, or other relevant barriers are empowered to be active in their energy choices, control their energy use, and enjoy the economic, environmental, and cost savings benefits of energy efficiency.

This Annual Plan includes substantial program enhancements and innovations designed to secure deeper, more comprehensive savings in 2021. The Plan also supports continued innovation and evolution, building enabling tools to accelerate the transition of Rhode Island homes and businesses to increasing levels of efficiency in future years. It balances the pursuit of energy and financial savings from current technologies and programs with the need to also identify new technologies, finance channels, and programs to continue delivering savings to Rhode Island customers for years to come. The Plan achieves savings by implementing the following key strategic priorities set out in the Three-Year Plan:

- Expand and deepen customer relationships.
- Drive adoption of comprehensive measures.
- Expand Active Demand Response.
- Achieve cost optimization and efficiency.
- Apply a deeper equity lens across all program planning and delivery.

Section 3.1.1 explains how the principles of program design included in the new LCP Standards have been applied to this Annual Plan, highlighting examples and providing direction on where deeper discussion may be found within the Plan. Sections 3.2 and 0 provide high-level summaries of program designs and changes for 2021 to Residential, Income Eligible Services, and Commercial and Industrial Programs. Section 3.4 offers detail on the cross-cutting programs for 2021, including the Community-Based Initiative, codes and standards, and workforce development. Lastly, Section 3.5 provides participant definitions and planned participation numbers.

3.1.1 Principles of Program Design

This Annual Plan has been guided by the newly revised LCP Standards, which provide an extensive set of principles of program design, listed below. This Plan's approach to incorporating these principles follows, with references to other areas of the Plan that provide greater detail.

Integration With Other Energy Programs and Policies

- Designed where possible, to complement the objectives of Rhode Island's energy programs and policies, and describe the interaction of EE Plans with these other programs, including, but not limited to, the System Reliability Procurement Plan; the Renewable Energy Standard; the Renewable Energy Growth Program; the Net Metering Program; and the Long-Term Contracting for Renewable Energy Standard; all energy supply procurement plans; and Infrastructure, Safety, and Reliability Plans.

Innovation

- Energy Efficiency Plans shall address new and emerging issues as they relate to Least-Cost Procurement as appropriate, including how they may meet State policy objectives and provide system, customer, environmental, and societal benefits.

Comprehensiveness

- The distribution company shall design EE Plans to ensure that all customers have an opportunity to benefit and realize both near-term and long-lived savings opportunities, and to deliver system-wide and location-specific savings.

Equity

- The portfolio of programs proposed by the distribution company shall be designed to ensure that all customers have equitable opportunities to participate in the offerings of EE Plans and a fair allocation of costs and benefits.

Build on Prior Plans

- The distribution company shall describe in an EE Plan the recent energy efficiency programs offered and highlight how the EE Plan supplements and expands upon these offerings at the appropriate level of detail, including, but not limited to, new measures, implementation strategies, measures specifically intended for demand or load management, and new programs as appropriate.

Build on Prior Programs

- Distribution company program development shall proceed by building upon what has been learned to date in distribution company program experience, systematically identifying new opportunities and pursuing comprehensiveness of measure implementation, as appropriate and feasible.

Plan Based on Potential Assessments

- At a minimum, the distribution company shall use any Targets and other Report recommendations approved by the PUC pursuant to Chapter 2 as a resource in developing its Three-Year Plan. The distribution company shall include in its Three-Year Plan an outline of proposed strategies to supplement and build upon these assessments of potential. The distribution company may also use other assessments or Report recommendations provided that such assessments or Report recommendations were not previously and specifically rejected by the PUC.

Unlocks Capital and Effectively Uses Funding Sources

- EE Plans shall include a Section outlining and discussing new strategies to make available the capital needed to effectively overcome barriers to implement projects in addition to direct financial incentives provided in order to cost-effectively achieve the Least Cost Procurement mandate. Such proposed strategies shall move beyond traditional financing strategies and shall include new capital availability strategies and partnerships that effectively overcome market barriers in each market segment in which it is feasible to do so.

Integration of Gas and Electric Energy Efficiency Programs

- EE Plans shall address how the distribution company plans to integrate gas and electric energy efficiency programs to optimize customer energy efficiency and provide benefits from synergies between the two energy systems and their respective programs.

Strategies to Achieve Targets

- Plans shall be developed to propose strategies to achieve the energy efficiency savings targets that shall be proposed by the Council and approved by the PUC for that three-year period. Such strategies shall secure energy, capacity, and system benefits and also be designed to ensure the programs will be delivered successfully, cost-effectively, and cost-efficiently over the long term. In addition to satisfying other provisions of these Standards, the EE Plans shall contribute to a sustainable energy efficiency economy in Rhode Island, respond to and transform evolving market conditions, strive to increase participation and customer equity, and provide widespread consumer benefits.

Investments on Behalf of All Customers

- Energy Efficiency investments shall be made on behalf of all customers. This will ensure consistency with existing program structure under which all customers pay for, and benefit from, Rhode Island's efficiency programs.

Efficacy

- All efforts to establish and maintain program capability shall be done in a manner that ensures quality delivery and is economical and efficient. The distribution company shall include wherever possible and practical partnerships with existing educational and job training entities.

Parity Among Sectors

- While it is anticipated that rough parity among sectors can be maintained, as the limits of what is cost-effective are identified, there may be more efficiency opportunities identified in one sector than another. The distribution company shall design EE Plans to capture all resources that are cost-effective and lower cost than supply. The distribution company shall consult with the Council to address ongoing issues of parity.

Cost-Effectiveness

- The distribution company shall propose a portfolio of programs that is cost-effective. Any program with a quantified benefit-cost ratio greater than 1.0 (i.e., where quantified benefits are greater than quantified costs), should be considered cost-effective. Consistent with the PUC's guidance issued in Docket No. 4600A, qualitative benefits and costs may be considered in determining cost-effectiveness. The portfolio must be cost-effective and programs must be cost-effective.

This Annual Plan has been designed to **integrate** with Rhode Island's energy programs and policies. Section 6 Coordination with Other Energy Policies and Programs provides details on the Plan's connection to specific state policies. The program descriptions found in Attachment 1 Residential & IES Programs and Attachment 2 C&I Programs offer additional specific detail on implementation and delivery, how the energy efficiency programs help customers achieve additional state energy policy goals, and information on energy programs beyond those run directly by the Company, such as programs for connecting to renewable energy sources and electrification opportunities.

This plan offers **innovations** in program design alongside a systematic approach to bringing innovative new technologies and approaches forward as outlined in the Three-Year Plan and in Section 4 Pilots, Demonstrations and Assessments, with additional detail in Attachment 8 Pilots, Demonstrations and Assessments. In addition, this plan features innovations designed in real time to respond to challenges presented by the COVID-19 pandemic, such as the development and refinement of virtual auditing for the residential Energy*Wise* programs[13] and new and creative marketing methods[14] for reaching customers, including developing and placing new over-the-top (OTT) and connected TV (CTV) ads, which play before streamed programming, and targeted video ad campaigns at drive-in movie theaters.

Comprehensiveness is a core design principle and a core strategy for both the 2021-2023 Three-Year Plan and this Annual Plan. This Plan includes multiple enhancements to reach and engage more customers, such as the simplified whole building pathway to capture more small and medium buildings in new construction,[15] and the addition of high payback measures in the Equipment and System Performance Optimization Initiative[16] to capture new customers and offer them more comprehensive approaches. The Commercial and Industrial market sector approach and the Residential and Income Eligible whole building delivery programs (Energy*Wise*, Multifamily, Income Eligible Services, and Income Eligible Multifamily) continue the evolution to deep comprehensive savings packages that emphasize whole building and whole system solutions, with **integration of gas and electric** energy efficiency to optimize and benefit from synergies between the two energy systems.

The program designs included in this Plan **build on prior plans** and **build on prior programs**. The detailed program descriptions provided in the Attachment 1 Residential & IES Programs and Attachment 2 C&I Programs offer snapshots and evidence of how programs are continuously evolving, building from one plan year to the next. They show how high-level strategies within the Three-Year and Annual Plans are translated into specific actions and activities that secure savings for customers and help to contextualize specific program innovations and enhancements described only briefly in Section 3.2 Residential and Income Eligible Programs and Section 3.3 Commercial and Industrial Programs.

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[13] See Attachment 1 Residential & IES Programs, Section 2 Energy*Wise* Single Family.
[14] See Attachment 1 Residential & IES Programs, Section 11 Marketing and Attachment 2 C&I Programs, Section 11 Marketing.
[15] See Attachment 2 C&I Programs, Section 2 Large C&I New Construction Program.
[16] See Attachment 2 C&I Programs, Section 5.7 Equipment & System Performance Optimization.

Attachments 1 and 2 provide detail on new measures, implementation strategies, measures specifically intended for demand or load management, and new programs.

Active demand response (or ConnectedSolutions) programming is a great example of how this Plan builds on prior plans and programs. Active demand response was first offered as a residential pilot in 2016 and a C&I pilot in 2017. In 2019, these pilots were converted to standard programs and continued in 2020. In this Plan, the Company proposes growing active demand response offerings and expanding them to new technologies.[17] The ConnectedSolutions programs in this Plan will deliver demand reductions that build upon prior success to grow participation and offerings for both commercial and residential customers in pursuit of the Active Demand Response Targets approved in Docket 5023.

Equity, as noted before, is a core strategic priority of the 2021-2023 Three-Year Plan and this Annual Plan. An equity lens has been applied to all planning and design updates. The Company is committed to ensuring that all customers have equal ability to access and benefit from energy efficiency programs, regardless of their geographic location, income, home ownership status, primary language, business size, or other relevant barriers; that jobs and economic development benefits of the programs reach all Rhode Island communities, with renewed emphasis on environmental justice communities; and that the energy efficiency services help the most vulnerable customers that may pay a higher proportion of their income in energy costs. Using an equity lens involves considering how programs are designed and evaluated with these goals in mind, as well as taking into account the systemic and institutional structures that may make it easier for some customers to access energy efficiency products and programs and more challenging for others. As discussed further below and in Section 8.1.2, the Company is taking several steps in 2021 in conjunction with the Office of Energy Resources (OER) and other stakeholders to further our empirical understanding of several facets of equity.

The Company believes that the first step toward addressing equity is to understand historic participation and the extent to which factors such as geography, income, homeownership status, and primary language differ between participants and non-participants. In addition, under the Prudency standard, the Company is required to "at minimum assess which groups have historically received disproportionately lower benefits from LCP investments." The Company will therefore undertake a non-participant study to understand the attributes of non-participants (i.e. addresses that have not participated in any Company energy efficiency programs over a defined period of time), assess barriers to participation, and identify engagement opportunities.[18] In addition, the Company will conduct a census of multifamily housing to understand multifamily participation and non-participation.[19] These studies will provide the data to build program enhancements and tracking systems that are driven

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[17] See Attachment 1 Residential & IES Programs, Section 10 Residential ConnectedSolutions and Attachment 2 C&I Programs, Section 7 C&I ConnectedSolutions.
[18] See Attachment 3 Evaluation Measurement & Verification Plan, Section 3.2c.
[19] See Attachment 1 Residential & IES Programs, Section 3 Multifamily and Attachment 3 Evaluation Measurement & Verification Plan, Section 3.2b.

primarily by the needs of identified non- and low participation groups, and to support additional market that is tailored for multilingual customers.

The Company is committed to using the rigor of non-participant and multifamily census studies to ensure that designs are informed by data and limit existing prejudices and biases from being solidified into program designs. The Company is not, however, waiting for study results to begin acting where the Company has good data and clear opportunities to immediately achieve more equitable outcomes and support our more vulnerable customers. The Company has committed to the following actions and enhancements to our programs in 2021 to achieve greater equity and support small business, moderate-income customers, and low-income customers:

- The Company is committed to tracking and reporting renters and rental unit participation (see Section 13.2.1).
- The Company is increasing its emphasis on identifying and encouraging customers eligible for the discount rate to move to the discount rate.[20]
- As customers move to the discount rate, the Company proposes to create a welcome package to encourage participation in applicable efficiency programming, specifically Residential Income Eligible Services (IES).[21]
- The Residential Consumer Products and Income Eligible Multifamily programs have teamed up to offer improved coordinated cooling solutions for income-eligible customers living in multifamily properties.[22]
- In the Company's workforce development programs, National Grid will focus on recruiting, training, and retaining talent from frontline and environmental justice communities, intentionally bringing more women and people of color into the energy efficiency workforce. This will create greater equity of access to the jobs generated by the clean energy transition and will help transition the workforce to better reflect the communities served. The desired outcome is to improve customer access and experience as customers find they are increasingly working with professionals from their communities and for these new professionals to begin to identify and help the Company adjust delivery to overcome community access barriers. See Section 3.4.3 for more information.
- Our new codes and standards advancement support program primarily targets the nonparticipant portions of the markets we serve across all sectors. While the program is in its infancy, this approach overcomes traditional barriers of access by ensuring that efficiency levels

[20] See Attachment 1 Residential & IES Programs, Section 4 Income Eligible Services.
[21] See Attachment 1 Residential & IES Programs, Section 4 Income Eligible Services.
[22] See Attachment 1 Residential & IES Programs, Section 4 Income Eligible Services and Section 8 Residential Consumer Products.

are rising for all. See Section 3.4.2 Cross Cutting Programs, Work Force Development for more information.

- The Company proposes the creation of an equity working group composed of members of the EERMC and OER, with additional input from local experts in equity, such as statewide community-based organizations. See Section 8.1.2 Prudency, Equity for more information.

This Annual Plan has benefited from the **Market Potential Study** and the areas of opportunity it identified have been considered in the program planning process. The RI PUC approved Targets, which reflect the study's maximum **potential assessment** assumed barrier reductions beyond current levels of program design and further improved customer economics by assuming 100% incentives, resulting in significantly higher budget levels than recent plans. The Company has combined this with **additional assessments** and analysis of results from the Evaluation Measurement and Verification programs, program experience, and customer and vendor feedback loops. The design enhancements to increase comprehensive projects emphasize capturing the specific opportunities identified in the Market Potential Study. For example, the bundled incentive designs in Energy*Wise* connect deep weatherization (insulation and air sealing) with additional heating and hot water measures, the measures identified in the Market Potential Study with the highest potential.[23] The Commercial and Industrial programs too have systematically focused all programs on measures with high potential. One easy to see result is the continued focus on bundling control technologies with high potential building, HVAC, and lighting end uses.[24] This Plan includes significant investments to ensure workforce capacity to support customer adoption of high efficiency technologies, including advanced control systems and air source heat pumps (see Section 3.4.3 Cross Cutting Programs, Workforce Development).

All program designs are connected to financing options to help **unlock capital and effectively use funding sources.** This Plan consistently looks beyond direct financial incentives and traditional financing strategies to design capital and program access strategies that respond to specific customer barriers. For example, exploring new financing support for small and mid-size independent grocers through OBR (on-bill repayment) or through an interest buy-down mechanism in partnership with third party providers of debt capital.[25] We believe this access to capital will allow customers to commit to projects more quickly or increase the number of measures installed. The Company is also exploring expanded use of the Heat Loan to help multifamily property owners invest in more comprehensive upgrades, regardless of meter type.[26]

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[23] See Attachment 1 Residential & IES Programs, Section 4 EnergyWise Single Family.
[24] See Attachment 2 C&I Programs, sections 3.1 Performance Lighting Plus, 5.9 and 5.10 Customer and Company Owned Street Light Equipment, 5.15.1 Upstream Lighting, 5.15.2 Upstream HVAC, and 6. Small Business Direct Install.
[25] See Attachment 2 C&I Programs, Section 5.1 Grocery Initiative.
[26] See Attachment 1 Residential & IES Programs, Section 3 Multifamily.

The primary **strategies to achieve savings goals** are guided by our five strategic priorities: expand and deepen customer relationships; drive adoption of comprehensive measures; expand active demand response; achieve cost optimization and efficiency; and apply an equity lens across all planning and delivery. Detailed strategies that target specific segments by responding to and seeking to transform specific markets can be found in Attachment 1 Residential & IES Programs and Attachment 2 C&I Programs.

Efficacy, or ensuring quality delivery that is economical and efficient, like comprehensiveness, is a core strategy of the Three-Year and Annual Plan. As Rhode Island energy consumers face economic repercussions from COVID-19, the Company has looked for opportunities to balance the portfolio of energy savings measures and program approaches to maximize cost efficiency (i.e. the amount of energy savings per dollar invested) and minimize the impact on customer bills. The "efficacy" principle of program design specifically calls for "practical partnerships with existing educational and job training entities." We have extensively expanded our partnerships with community colleges, high schools, and middle schools, leveraging existing educational and job training infrastructure within the communities from which we seek to draw increased trainees and future workers. The Company will coordinate with the Department of Labor and Training's Real Jobs Rhode Island program and the Rhode Island Department of Education's PrepareRI initiative to help promote existing solutions to reduce or eliminate duplication of effort and expenditures. For more information see Section 3.4.3.

All program designs maintain **cost effectiveness.** The Company updates its cost effectiveness models during planning and as evaluation data and program implementation insights arrive. A detailed discussion of cost effectiveness is provided Section 8.4 Cost Effectiveness. The application of cost effectiveness as a design principle, however, involves a balancing of the drive for comprehensive projects with long-term measures, which tend to be complex and challenging for customers to adopt and therefore have higher savings acquisition cost, with opportunities for highly cost efficient savings provided through programming that requires less intensive customer support, such as upstream programming and work on codes and standards, as well as highly cost efficient programs such as the Strategic Energy Management Planning with very large customers.

3.2 Residential and Income Eligible Programs

2021 is a pivotal year for residential energy efficiency programming. It marks the completion of the transformation of the residential lighting market and the final year incentives will be offered for residential lighting at the retail level. This shift is the culmination of years of innovation and intentional program design resulting in the successful evolution of the residential lighting market. This first year of the 2021-2023 Three-Year Energy Efficiency Plan seeks to initiate a similar transformation in the way Rhode Island homes use energy for heating, cooling, and hot water. The vision is to support the creation of super-efficient homes that help customers maximize their use of efficiency and expand the range of clean energy options. This vision is for all homes to be effectively insulated, have safe and efficient heating, cooling and hot water systems, encourage customers to see their home as a comprehensive system, and transform the residential new construction industry to a Zero Net Energy market.

The Company has focused heavily across all residential and income eligible services programs to supercharge weatherization, efficient heating and hot water. The elevation of these three critical areas reflect stakeholder priorities and opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the EERMC and the EERMC consulting team, OER, the Division, our vendors and customer feedback. There are new bundled incentive designs, enhancements that make participation in multiple programs easier or more attractive, and reduce barriers to adoption of comprehensive measures.

For each of the Residential and Income Eligible Services Programs listed in Table 3 below, an overview of 2021 programs is provided in Table 4 and Table 5. For more detailed program descriptions, please refer to Attachment 1 Residential & IES Programs. Rationales for 2021 program changes are included under "rationale" in the program description tables in Attachment 1.

Table 3. Residential and Income Eligible Programs

Energy*Wise* Single Family	**Income Eligible Single Family**
Multifamily	**Income Eligible Multifamily**
Residential New Construction	
Home Energy Reports	
ENERGY STAR® Lighting	
Residential Consumer Products	
Residential High Efficiency Heating and Hot Water (ENERGY STAR® HVAC)	
Residential Connected Solutions	

3.2.1 Residential Programs

In 2021, the Company will continue all residential programs offered in 2020, while examining the potential of new technologies for inclusion in future years.

Table 4. Overview of 2021 Residential Energy Efficiency Programs

Program Name	Program Description	Changes for 2021
Energy*Wise* Single Family (Funded by Electric and Gas)	Energy*Wise* is a direct-to-customer in-home program that educates residents on how their home can become more energy efficient. The program offers single-family customers (buildings with 1-4 dwelling units) home energy assessments, weatherization services, and information regarding their energy usage. The program addresses base load electric use and heating, cooling, and water heating energy loads in all residential buildings. Participants receive energy efficiency recommendations and technical assistance, as well as financial incentives to replace inefficient items such as lighting fixtures, appliances, thermostats, and insulation. Upgrades to efficient lighting, advanced power strips, and water saving devices are made if opportunities exist during the initial visit. At the completion of the assessment, the customer receives an Energy Action Plan that indicates additional energy savings opportunities delivered through National Grid's various programs, as	• Add a Smart Plug assessment to the suite of EnergyWise services to capture potential savings from customers who "always leave on" their appliances and to build customer engagement around more control over household products. • Continue to offer Virtual Home Energy Assessments, iterating the offering based on ongoing assessment of alignment of weatherization scopes and conditions, contractor needs, cost implications, and customer satisfaction. • Continue the 100% weatherization incentive for moderate income customers.27 • Increase marketing to encourage renter and landlord participation and continue the 100% weatherization incentive for landlords, expanding energy efficiency benefits to additional moderate income customers (i.e. renters).

[27] See Attachment 1 Residential & IES Programs, Section 2 EnergyWise Single Family for additional detail on plans to define moderate income customers.

Program Name	Program Description	Changes for 2021
	well as solar opportunities provided through statewide solar initiatives. The program will continue to deliver finance opportunities to customers, such as the Heat Loan.	• Design a bundled enhanced incentive that supports customers who commit to comprehensive savings by combining weatherization with another major energy system (e.g. heating and cooling, hot water heaters). • Energy specialists will facilitate connections to HVAC and/or electrical contractors if the customer does not have a preferred vendor to assist with pre-weatherization barriers. • Increase customer connections to other programs (e.g. verify presence of smart thermostat during in-home visit and refer to ConnectedSolutions). • Continue ongoing research to identify companies that use publicly available information to develop initial home energy efficiency scores to help inform 2022 program opportunities. • Research whether residential customers would be interested in an on-bill feature to spread out customer costs associated with energy efficiency upgrades. • Jointly sponsor research with other utilities through ESource and ICF to advance the evolution of incentive design through the Incentive Project, exploring the

Program Name	Program Description	Changes for 2021
		application of lessons from academic research.
Multifamily (Funded by Electric and Gas)	This program offers comprehensive energy services for market-rate multifamily customers (buildings with 5+ dwelling units), including energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting, and appliances. All types of multifamily properties are eligible. A primary point-of-contact is designated to manage and coordinate services offered through the Company's existing portfolio. This program is offered in conjunction with the C&I Multifamily gas program where a site may have a commercial meter or office space, but should be virtually indistinguishable to the customer as the Company's single point of contact will handle all program overlap and offer a seamless customer experience.	• Examine a tiered incentive approach to encourage building owners and facility managers to include more residential unit owners in multifamily projects. • Provide greater customer choice to the condominium market by enabling customers to choose their own HVAC contractor and assess the impact on participation. • Implement recommendations from Multifamily Impact and Process Evaluations (e.g. health and safety barrier remediation, redesigning the customer energy report, identifying the long-term role of virtual energy assessments in multifamily buildings). • Leverage the Multifamily Census to implement targeted marketing to newly identified five to 20 unit small- and medium-sized multifamily owners not served to date. • Utilize customer research planned for 2021 to further explore the value of tax incentives for multi-family programs by including tax incentives in research to understand and identify potential drivers and

Program Name	Program Description	Changes for 2021
		motivations for increasing customer participation in multi-family programs in future years. • Explore whether enhancements to the Heat Loan to finance larger improvements for deeper energy savings in multifamily buildings would be attractive to larger multi-family property owners and drive participation. • Revisit co-branded marketing with the multifamily vendor and consider more prominent Company placement for greater customer trust, ease, and ultimately participation. • Invest in professional development for multifamily energy auditors to improve sales acumen and deepen savings.
Residential New Construction and Building Energy Code Support (Funded by Electric and Gas)	The Residential New Construction (RNC) program promotes the construction of high-performing energy efficient single family, multifamily, and income eligible homes, as well as the education of builders, tradespeople, designers, and code officials.	• Integrate the 2020 Zero Energy Pilot components into primary delivery and incentive offerings. • Refresh program content related to codes and standards to reflect the State's expected code update.
Home Energy Reports (Funded by Electric and Gas)	The Home Energy Reports (HER) program encourages energy efficiency behavior through personalized print and email reports and a seamlessly integrated website. Each of the communication channels displays energy consumption patterns and contains a normative comparison to similarly sized and similarly heated homes, as well as to	• Adopt 2020 evaluation recommendations to optimize savings (e.g. remove mover cohorts with historically lower energy savings over several years, increase opportunities to collect email addresses for eHERs).

Program Name	Program Description	Changes for 2021
	an energy reduction goal for each customer. 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 increase their participation in other energy efficiency programs.	• Roll out HER 3.0 with several enhancements to encourage behavior modification and support solar-specific neighbor comparisons, enabling promotion of ConnectedSolutions to solar customers.
ENERGY STAR® Lighting (Funded by Electric Only)	This program is 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, pop-up retailers, and social marketing campaigns. The program also provides retailer support with training of qualified products, in-store education events for customers, retailer verification of program signage, and online training of products and promotions.	• Offer the same lighting products offered in the past, with the exception of reflectors, which have been widely adopted according to recent evaluation studies. However, the incentives will be lower for select products including standard LED bulbs, specialty bulbs, fixtures, and linear LEDs.
Residential Consumer Products (Funded by Electric Only)	This program is run in collaboration with other regional utilities to promote the purchase of high efficiency household appliances, including kitchen appliances and electronics carrying the ENERGY STAR® label. In combination with ENERGY STAR® Lighting, this program trains retail sales staff about products. The program also offers refrigerator recycling.	• Assess the cost effectiveness of joining the ENERGY STAR® Retail Products Platform (ESRPP) and join if cost effective. • Develop a baseline of renter information through customer mail-in or online rebates to inform future equity insights, as renters are a customer demographic that stakeholders have expressed an interest in prioritizing the assurance of equitable delivery of service to.

Program Name	Program Description	Changes for 2021
		• Coordinate with the Income Eligible Multifamily Program and Public Housing Authorities to provide no-cost, energy efficient cooling options for income eligible multifamily customers by streamlining ordering and processing rebate applications in bulk.
Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC) (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, and boiler reset controls. Incentives for energy efficient air source heat pumps for space and water heating equipment are available for customers with electric resistance heating/hot water. Incentives are also available for air source heat pumps used as accessory heating and cooling devices in homes with a primary heating system that is natural gas, oil, or propane. The program provides training of contractors to increase accurate installation practices, testing of the high efficiency systems, tiered rebates for new ENERGY STAR® systems, and incentives for checking new and existing systems.	• Develop a lead generation process in conjunction with Energy*Wise* and work with HVAC contractors to educate them around how to further promote incentives to customers. • Develop HVAC equipment rebate bundles (e.g. boiler/furnace + WiFi thermostat). • Target relevant electric customers with messaging encouraging them to convert to heat pumps through enhanced marketing.
Residential ConnectedSolutions (Active Demand Response)	ConnectedSolutions is National Grid's demand reduction program that uses electric active demand reduction strategies to reduce peak	• Offer an electric vehicle-based demand response program to demonstrate cost-effective peak

Program Name	Program Description	Changes for 2021
(Funded by Electric)	electrical demand periods throughout the year. Consumers with eligible controllable equipment (e.g. Smart thermostats, batteries, lighting, water heaters, pool pumps, electric vehicles) can enroll to participate in active demand reduction. All consumers can participate in ConnectedSolutions.	load reduction from EVs; enroll 145 vehicles in the first year. • Develop new initiatives to increase enrollment in smart thermostat-based demand response (e.g. integrate the DR incentive into the National Grid marketplace, integrate enrollment in ConnectedSolutions into the setup process for qualifying thermostats).

3.2.2 Income Eligible Programs

The Company and the Parties 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. Therefore, this segment of the customer base is designated as a unique sector, and funding for this sector will be subsidized by both residential customers who do not qualify for income-eligible services and commercial and industrial customers using 16.0% of total implementation funding for the electric programs, and 27.2% for natural gas programs. Total implementation funding for income eligible electric programs increased 14% from 2020 levels from $16.4M to $18.7M, leading the overall proportion of funding going to the income eligible electric sector to increase from 15% in 2020 to 16% in 2021. Total implementation funding for income eligible gas programs increased 13% from 2020 levels from $8.7M to $10.0M, leading to the overall proportion of funding going the income eligible gas sector to remain at 27% in 2020 and 2021.

Table 5. Overview of 2021 Income Eligible Programs

Program Name	Program Description	Changes for 2021
Income Eligible Single Family (Funded by Electric and Gas)	Income Eligible Single (IES) Family Services are delivered by local Community Action Program (CAP) agencies with oversight provided by a Lead Industry Partner. Three levels of home energy assessments are offered: (1) lighting and appliance, (2) heating and weatherization, and (3) comprehensive. Customers who qualify for the A-60 rate or for the Low-Income Home Energy Assistance Program (LIHEAP) are eligible to receive all services and equipment upgrades at no cost.	• Ensure applicable customers are enrolled in the discount rate program, coordinating with National Grid's Consumer Advocacy Team to cross-promote IES offerings when customers enroll in the discount rates, including creation of a welcome package. • Implement a third-party support model to expand CAP capacity to serve customers through a third-party service provider and ensure greater equity across CAP territories. Possible formats will be tested in 2020 and lessons learned will inform an RFP for these services in 2021. • Implement recommended improvements from the 2019 Process Evaluation (e.g. rebuild/stabilize the number of qualified assessors, increase weatherization conversation rates, review effectiveness of non-standard work specification projects, engage with landlords). • Increase awareness of the IES Program through coordination and partnership with State and market-based organizations and determine the need and/or benefit of hosting a consortium on serving IES customers.

Program Name	Program Description	Changes for 2021
		• Work with CAPs on utilizing two-person energy assessment teams to streamline the assessment process. • Develop a protocol for offering smart thermostats to homes with central AC to improve efficiency and operability and align with ConnectedSolutions when possible. • Develop a new, holistic email marketing strategy that leverages personalization to promote IES.
Income Eligible Multifamily (Funded by Electric and Gas)	Comprehensive energy services for multifamily customers (buildings with 5+ dwelling units) that also meet the criteria for "income eligible" as defined in Attachment 1 Residential & IES Programs, Section 3. Multifamily. These services include energy assessments, incentives for heating and domestic hot water systems, Air Source Heat Pumps, cooling equipment, lighting, and appliances. There are no costs to the customer for these services as all income eligible upgrades are covered at 100%.	• Coordinate with the Residential Consumer Products Program and Public Housing Authorities to provide no-cost, energy efficient cooling options for income eligible multifamily customers by streamlining ordering and processing rebate applications in bulk. • Leverage the Multifamily Census to implement targeted marketing to newly identified income eligible properties not served to date.

3.3 Commercial and Industrial Programs

The Commercial and Industrial (C&I) programs consistently offer highly cost-efficient savings. The Company is continuously evaluating and responding to customer needs and market dynamics to develop enhancements that secure deeper, more comprehensive savings while strategically evolving program designs to drive market transformation across multiple end uses.

The Company has focused on non-lighting opportunities and program enhancements that help drive progress toward deeper comprehensive measure adoption in every customer class. The specific priority measures vary by customer but are reflective of opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the EERMC and the EERMC consultant team, OER, the Division, and our vendors, as well as customer feedback. Summarized in Table 7 below and described in more detail in Attachment 2 C&I Programs, there are new market segment designs under development to engage new customers with tailored approaches to comprehensive savings adoption (new Telecommunication initiative), enhancements that make participation easier or more attractive (see Equipment and Systems Performance Optimization, Small Business), and multiple enhancements that focus on reduction of barriers to comprehensive measure adoptions (Whole Building Streamlined pathway in New Construction).

For each of the Commercial and Industrial Programs listed in Table 6 below, an overview of 2021 programs is provided in Table 7. For more detailed program descriptions, please refer to Attachment 2 C&I Programs. Rationales for 2021 program changes are included under "rationale" in the program description tables in Attachment 2.

Table 6. Commercial and Industrial Programs

Large Commercial and Industrial New Construction
Large Commercial and Industrial Retrofit
Small Business Direct Install
Connected Solutions (Active Demand Response)
Commercial and Industrial Multifamily Program

Table 7. Overview of 2021 Commercial and Industrial Energy Efficiency Programs

Program Name	Program Description	Changes for 2021
Large Commercial and Industrial New Construction and Building Energy Code Support (Funded by Electric and Gas)	This program encourages energy efficiency in new construction, major renovations, planned replacement of aging equipment, and replacement of failed equipment through financial incentives and technical assistance to developers, manufacturers, vendors, customers, and design professionals. Commercial and industrial customers with annual electric consumption greater than 1,000,000 kWh per year are eligible. The program supports new construction projects with proactive technical assistance during design with energy modeling and analysis. Incentives are also offered to owner's design teams for their time and effort to meet program requirements. The program promotes and incentivizes the installation of high efficiency equipment in existing facilities during remodeling or equipment failure and replacement. A customer who does not install energy efficient equipment at the time of new construction or equipment replacement will likely never make the investment or will make the investment at a much greater cost at a later time. Operations Verification or quality assurance is also offered to ensure that the equipment and systems operate as intended.	• Offer two new pathways, Zero Net Energy Ready (ZNER) and Whole Building Energy Use Intensity, to drive deeper, more comprehensive savings using Energy Use Intensity (EUI) as a tool. For both pathways, the Company will offer technical assistance to building owners and design teams to set EUI goals and assist with modeling projects at various stages of design. The Company will set the EUI threshold for the new pathways based on the MA Accelerate Performance demonstration and MA Program Administrators' experience with Zero Net Energy Buildings. • Modify and rename the Integrated Design pathway the Whole Building Streamlined pathway and simplify the process with a streamlined spreadsheet methodology to calculate savings in order to increase participation by smaller buildings. • In January 2021, RI plans to adopt the 2018 IECC building code. RI program baselines, where applicable, will then be based on the 2018 IECC Building code and savings calculations will be based upon

Program Name	Program Description	Changes for 2021
	The program also promotes compliance with the building energy code and increased use of the Stretch Code to support the State's goals and objectives. In addition, it provides technical assistance in advancing the development and adoption of minimum efficiency standards for appliances and equipment. Finally, the program supports the State's Zero Energy Building (ZEB) goals through engagement and development of ZEB programs in the future.	achievements over this new higher baseline. • Determine a pathway to incentivize architectural firms to participate in the American Institute of Architects (AIA) 2030 Challenge, which commits firms to tracking the EUI of their projects and portfolio annually and reducing their designed EUI to a carbon neutral level by 2030. • Revise the *Performance Lighting Plus* initiative incentive offerings and requirements in concert with Massachusetts colleagues to ensure greater ease of customer participation, remove inconsistencies, and account for changes in the lighting market. The Company will collaborate with the lighting sub-group of EERMC Consultants before the offering is finalized and published to customers.
Large Commercial and Industrial Retrofit (Funded by Electric and Gas)	This program incentivizes the replacement of existing equipment and systems with energy-efficient alternatives when the customer might otherwise not plan on making efficiency investments. This may include energy efficient equipment such as lighting, motors, and heating, ventilation and air conditioning (HVAC) systems, thermal envelope measures, and custom measures in existing	• Launch a new *Telecommunications Initiative* to serve mobile, fiber optic, and cable data companies and their associated infrastructure through technical assistance, project management, and incentives, delivering savings from non-lighting as highlighted in the Market Potential Study. • Pursue a custom fuel cell project that will enable the

Program Name	Program Description	Changes for 2021
	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. The Company also offers education and training, such as the building operator certification (BOC) training, to support the implementation and adoption of energy efficiency.	customer to generate on-site electricity and reclaim carbon dioxide for process related needs. • *Grocery Initiative:* Deploy new measures (e.g. anti-fog film) to support "click and collect" customers who purchase groceries online and pick them up in designated in-store locations. Provide financing for small- and medium-sized independent grocers through OBR or an interest buy down mechanism in partnership with third party providers of debt capital. • *Industrial:* Increase focus on customers in the 200-400 kW range to encourage greater participation by small- and medium-sized customers. Add a digital signature option to the application approval process to reduce administrative burden and expedite project sign-offs. • *Strategic Energy Management Planning:* Ramp up efforts to engage more customers (e.g. colleges/universities, cities, industrial customers, and chain restaurants). Provide educational customers with access to an energy solutions provider specialized in campus energy infrastructure. • *Equipment & Systems Performance Optimization:*

Program Name	Program Description	Changes for 2021
		Include heat exchanger coil cleaning to the prescriptive low-cost tune-up measures. • *Lighting Designer Incentives:* Create a one-pager for new construction or major retrofit customers that articulates the benefits of hiring a lighting designer. • *Farm/Agriculture:* Explore simplifying the initiative for customers with multiple meter types in an attempt to address weak participation to date. • *Combined Heat & Power:* Provide an additional incentive tier to CHP systems that leverage biogas as a fuel source and offer an Optimal Operation and Maintenance Incentive for biogas CHP systems to reduce economic barriers associated with the installation, operation, and maintenance. • *Commercial Real Estate:* Due to market uncertainty associated with COVID-19, this initiative is on pause as the Company continues to monitor market conditions. • *Extended Care Facilities:* Customer feedback indicated a majority of facilities did not have or prioritize the resources to explore EE opportunities, even with a generous cost share. Therefore, the Company will work with the small business

Program Name	Program Description	Changes for 2021
		vendor and current salesperson to refine the initiative approach. • *Lodging/Laundry:* Research and document industry and EE technology barriers to inform development of future offerings and identify attributes of successful future vendors and associated scopes of work. • *Upstream Products:* Increase incentive support for Luminaire Level Lighting Controls (LLLCs) and marketing of all lighting products to small businesses. Note centrally ducted heat pumps will move to the downstream pathway to align with the MA Program Administrators.
Small Business Direct Install (Funded by Electric and Gas)	This is a retrofit program that provides turn-key solutions to customers that consume less than 1,000,000 kWh per year. As part of the program, customers receive a free on- site energy assessment and a customized report detailing recommended energy efficient improvements. National Grid then completes retrofit installations at the customer's convenience. The program serves small businesses of all types from restaurants to non-profits, to small offices. National Grid pays up to 70% of installation and equipment costs and customers can finance the remaining share of the project over as many as 60 months (typically 24) on their electric bill, interest free, using the Small Business Revolving Loan Fund, providing that funds are available.	• Increase focus on non-lighting opportunities (e.g. hood controls, other HVAC controls) and savings per the Market Potential Study. • Substantially increase the amount of gas weatherization provided to small businesses to bolster this segment's savings and benefits during a financial downturn. • Work to achieve 30% percent of installed luminaires and retrofit kits with integrated controls. • Run segmented marketing campaigns directed at very small business customers (under 25,000 kWh consumed

Program Name	Program Description	Changes for 2021
		per year) who may not need an energy audit to make energy improvements and local electricians to market Upstream products available at a discount.
Commercial ConnectedSolutions (Active Demand Response) (Funded by Electric)	The Commercial Connected Solutions or Active Demand Response program is focused on reducing peak electric demand and associated costs for large and small commercial customers. All customers, regardless of size can participate. The program is technology agnostic and provides a customer incentive for verifiable shedding of load in response to a signal or communication from the Company.	• At this time, no program changes are anticipated related to Targeted or Daily Dispatch for 2021. Ongoing evaluation of summer 2020 performance may generate opportunities to improve the program in 2021, however results are not expected until shortly after the filing of this Plan. The Company will share any proposed program changes resulting from the evaluation with stakeholders prior to implementing changes. • Coordinate with the Company's other new Energy Storage Initiatives, which test the ability of grid-connected systems to mitigate the load impact associated with EV charging, both behind-the-meter and front-of-the-meter, in order to identify applications that benefit customers and the grid as a whole and advance the storage market.
Commercial and Industrial Multifamily (Funded by Gas)	Comprehensive energy services for market-rate multifamily customers (buildings with five plus dwelling units) include energy assessments and incentives for heating and domestic hot water systems and	• Implement recommendations from Multifamily Impact and Process Evaluations (e.g. health and safety barrier remediation, redesigning the customer energy report, identifying the long-term

Program Name	Program Description	Changes for 2021
	weatherization. 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.	role of virtual energy assessments in multifamily buildings). • Leverage the Multifamily Census to implement targeted marketing efforts to newly identified five to 20 unit small- and medium-sized multifamily owners, newly identified income eligible properties, and other newly identified properties that have not been served by the program to date. • Explore whether enhancements to the Heat Loan to finance larger improvements for deeper energy savings in multifamily buildings would be attractive to larger multi-family property owners and drive participation. • Reevaluate co-branding with the Multifamily vendor to consider more prominent Company placement to facilitate greater customer trust, ease, and ultimately participation. • Invest in professional development for multifamily energy auditors to improve sales acumen and deepen savings.

3.4 Cross-Cutting Programs

3.4.1 Community-Based Initiative

The Rhode Island Community-Based Initiative is the Company's energy efficiency awareness campaign that drives program participation by deep municipal engagement with residents and small businesses through the advocacy of local officials. The Company provides goals to the municipality to drive end-customer adoption of efficiency measures and small business program projects. These municipalities, in

turn, work to achieve the goals with the help of volunteers and promotions at local events.[28] Small businesses are invited to workshops organized in conjunction with the local chamber of commerce or other local business organizations. These workshops will inform customers about the National Grid Small Business Direct Install Program, Commercial Property Assessed Clean Energy (C-PACE) financing, and active demand response.

Comprehensive marketing toolkits are provided to the municipality, along with trainings empowering employees to discuss energy efficiency with their residents and small businesses. Frequent check-in calls allow the communities to speak with the Company regarding progress and share tactics and ideas with other participating municipalities. Events are staffed by the Company, municipality, or volunteers throughout the campaign at various events and school functions. At the end of the year, municipalities earn grant monies based on achieving the agreed percentage increase in the identified goal. These funds are then utilized for energy saving projects on a municipal property, or on educational energy programs for community members.

In the first quarter of 2021, the Company will recruit Rhode Island municipalities based on opportunities for increases in residential and small business program participation as well as possible active demand response opportunities. As the Company has run this effort successfully since 2013, prior participating communities may again be invited to take part. The initiative will continue to coordinate with the System Reliability Procurement (SRP) team to determine whether the RI System Data Portal (Portal), which was developed in 2018, could be a valuable tool for the use of educating municipal leadership, as well as the Company in recruiting municipal participation.

A continued focus for 2021 will be the promotion of new technologies within the communities such as Wi-Fi Thermostats and active demand response offerings. The Company will target engagement with communities that have larger population of income eligible residential customers. The Company will also consider including locational program incentives to drive increased participation in a measure that may be underrepresented within that community. Examples could include special flash-sales for a measure such as a Wi-Fi thermostats, or a promotional increase in an incentive. Any increase in incentive would be determined by the Company considering budget and cost-effectiveness. The purpose of this may be for driving community participation, meeting energy efficiency goals, or creating equity. If such programs or efforts are part of an SRP initiative, then they would follow SRP considerations noted in Section 6.1 and be detailed in the System Reliability Plan.

Small Business project promotions were included in the prior year and an increased focus will be placed on recruiting small business participation in 2021. Specifically, the Company's lead vendor for the Small

[28] Concerns around COVID-19 required changed approaches to in-person events in 2020 and will be revisited in 2021 as health and safety considerations warrant.

Business program will go door to door in the community's main business district to offer direct install measures on-site and propose larger energy saving opportunities upon a follow up visit.

One of the challenges faced by this initiative is the lack of resources at towns and cities to promote and implement energy efficiency within the communities. One of the ways in which the Company plans to address this is by coordinating efforts with OER's project, Advancing Energy Efficiency in Underserved Small, Medium and Rural Communities. This project, among its other goals, looks to increase resource capacity for small, medium, and rural communities to implement and manage energy investments with an on-site energy manager.

Building upon the community-based approach stated above, the Company plans to advance this approach by developing new partnerships with other types of organized communities under a new Community Solutions initiative. This will include geographic communities that encompass multiple towns (e.g. Aquidneck Island), industrial and technology parks, and other organized communities such as industry groupings with common end uses (e.g. indoor agriculture). Community Solutions will provide a single point of contact for a given community to access all available Company solutions, including energy efficiency, EVs, demand response and emerging technologies.

3.4.2 Codes and Standards Support

The Company will provide two distinct types of technical guidance – compliance support and advancement support – to both the residential and commercial markets. While the Company has delivered code compliance support since 2013, codes and standards advancement support will be ramped up after demonstrating its viability in 2019-2020. The Company is committed to collaborating with stakeholders on an updated incentive mechanism for codes and standards activities and proposes the activities in this section with the goal and expectation of filing this mechanism in the 2022 Annual Plan.

Codes and Standards Compliance Support

The energy code provides highly cost-effective and long-lasting energy savings, but studies of RI construction projects show that a material portion of these savings are lost due to noncompliance. The Code Compliance Enhancement Initiative (CCEI) includes robust stakeholder engagement and industry group outreach, classroom, virtual, and in-field trainings, project-specific technical assistance circuit riding, development and dissemination of documentation/compliance tools, and other services. CCEI will support compliance with the latest version of the state's building energy code, which is expected to be updated by early 2021. CCEI will also continue to promote market awareness and uptake of the R.I. Stretch Code, as well as high-level technical support for projects pursuing use of this voluntary standard.

CCEI addresses new construction for residential and commercial buildings, but also addresses additions and renovations. The primary target audiences for CCEI are code officials, construction professionals (builders and developers), and design professionals (architects and engineers), but the program has also historically reached several other stakeholder groups. CCEI plans to deliver roughly 40 trainings and

reach at least 500 participants in 2021, which aligns with the Initiative's achievement in 2018 (40 trainings and 532 participants) and 2019 (46 trainings and 823 participants).

Conditional to the adoption of any new state appliance standards before the end of 2021, the Company will begin monitoring compliance with these standards to gauge the market need for similar industry engagement activities.

Codes and Standards Advancement Support

Supporting the development and adoption of more efficient minimum energy efficiency requirements for buildings and the energy-using products within them is a significant untapped energy savings opportunity. Raising minimum standards across an entire market is typically more cost-effective than a conventional program targeting the same market because customer incentives are not needed. Presently, the state receives only 5.5 of the 11 points available for Codes & Standards in the ACEEE scoring,[29] which holds Rhode Island back from increasing its national ranking.

The Company will provide technical guidance during the State's upcoming 2021 IECC code adoption process to help increase the efficiency of the State's next energy code. Specifically, the Company will prepare energy code change proposals and backup analysis, engage relevant industry stakeholders to refine these proposals, and provide technical guidance to the State's Building Code Standards Committee throughout their review of the proposals. Furthermore, the Company will investigate opportunities to inform the 2024 IECC development process at the national level as national model codes form the basis from which Rhode Island adopts its state-wide energy code. Code advancement activities planned for 2021 and downwind evaluation implications for any successful interventions are summarized in the following table.

Table 8. 2021 Planned Code Advancement Activities

Topic	Activities and Scale	Future EM&V Needs (ETA)
Remove current RI weakening amendments	Develop code proposals for RI's 2021 IECC update cycle to remove any weakening amendments remaining in RI's 2018 IECC (expected fall 2020)	Assess gross savings (2022/2023)
Counter establishment of new RI weakening amendments	Develop proactive justification analysis for the "top 10" new provisions in 2021 IECC (weighted toward residential sector where	Assess gross savings (2022/2023)

[29] ACEEE. 2018 State Energy Efficiency Scorecard. https://database.aceee.org/state/rhode-island

	more resistance to these provisions is expected)	
Add RI strengthening amendments (above 2021 IECC)	Develop about six new code proposals (expected to focus primarily on existing buildings); revise any unsuccessful proposals from RI's 2018 IECC update cycle (expected fall 2020)	Assess gross savings (2022/2023)
Strengthen 2024 IECC national model code	Submit strengthening amendments, including strengthening proposals to RI's 2021 IECC, as code proposals for the 2024 IECC national code development process	Assess gross savings (2022/2023 upon completion of 2024 IECC; adjust in 2025/2026 upon RI adoption)

The Company will also provide technical guidance to update the State's appliance and equipment efficiency standards. Specifically, the Company will conduct analyses to complement the products researched by the Appliance Standard Awareness Project (ASAP), engage relevant industry stakeholders to refine these analyses, and coordinate with other states in the northeast region. Furthermore, the Company will investigate opportunities to support appliance and equipment standards at the federal level. Standards advancement activities planned for 2021 and downwind evaluation implications for any successful interventions are summarized in the following table.

Table 9. 2021 Planned Standards Advancement Activities

Topic	Activities and Scale	Future EM&V Needs (ETA)
Support most recent set of proposed RI standards	Develop justification analyses for contested products in the ~20 product ASAP package (e.g. computers and monitors)	Assess gross savings (2021/2022)
Research new products for RI standards	Identify opportunities for RI state standards not actively pursued by ASAP or other entities	Asses gross savings (~2026 upon RI adoption)
Support federal standards	Provide program data and related information to inform the federal standards review and development process (over 25 products are overdue for updates in addition to U.S. DOE's regular update cadence)	Assess gross savings (~2026 upon federal adoption)

There is typically a multi-year time lag between when new codes and standards are adopted, when they become effective, and when the resulting savings are realized. Due to this time lag, no savings are expected to come to maturity from this potential effort until 2022 based on code advancement support efforts undertaken in 2019-2020.

3.4.3 Workforce Development

The Company anticipates increasing its workforce development budget to roughly 1 percent of total portfolio expenditures to expand the size and skillset of the efficiency workforce. The Company will utilize a three-prong approach in 2021 in alignment with our Three-Year strategy.

1. *Improve Our Labor Market Intelligence*: The Company will refine efforts to quantify current workforce gaps launched in 2020, including updating analyses amidst economic volatility. Building upon these efforts, the Company will begin forecasting how these gaps are expected to change in future years, which will supplement its retrospective Workforce employment study. Stakeholders such as OER, DPUC, the TWG, and RI's Dept of Labor & Training will be included in this process.

2. *Upsize and Upskill Today's Workforce*: To help fill these gaps in the near-term, the Company will facilitate training and other professional development opportunities such as mentorship programs. These efforts will include both growing the size and skillset of the state's energy efficiency workforce using approaches tailored to match the need of the particular market. In 2021, the Company will weight these efforts toward upskilling activities targeting markets with high potential savings and high confidence of positive impact (see Table 10).

3. *Build a More Sustainable, Equitable Pipeline*: The Company will expand our work with Community colleges, high schools (including vocational and technical schools), and middle schools to steer more candidates toward careers in energy efficiency and leverage existing educational and job training infrastructure within the communities we serve to provide additional support to disadvantaged groups. The Company will support curriculum enhancements, career and technical education (CTE) opportunities, recruitment campaigns relevant to demographically diverse populations (particularly gender, race, ethnicity, language, and income), and other engagement opportunities within schools and communities to promote a steady, lasting, and more equitable pipeline of entrants to the energy efficiency industry. The Company will coordinate with state and local authorities, including the Department of Labor and Training's Real Jobs Rhode Island program and Rhode Island Department of Education's PrepareRI initiative, to guide the development and delivery of these efforts and help promote existing solutions to reduce or eliminate duplication of effort and expenditures.

Table 10. Investment Across Three-Pronged Workforce Development Approach

Prong	2021 Activities	2021 Budget
1. *Improve Our Labor Market Intelligence*	• Refine and update 2020 workforce gaps • Forecast future workforce gaps	$50k
2. *Upsize and Upskill Today's Workforce*	Residential and Income Eligible: • New Construction, Zero Energy Homes, and Code Compliance (builders, designers, code officials) • Advanced HVAC (contractors) • Air Source Heat Pump (ASHP) (installers, designers) • Others subject to market conditions	$400k
	Commercial & Industrial: • New Construction, Zero Energy Buildings, and Code Compliance (developers, designers, code officials) • HVAC Controls and RCx (controls programmers) • Advanced lighting controls (electrical contractors, lighting firms, manufacturer representatives, Cx agents) • Building Operator Certification (facility managers) • Others subject to market conditions	$500k
3. *Build a More Sustainable and Equitable Pipeline*	• School engagement, including promotion of EE opportunities within CTE structure • Industry engagement, including expanding internship, mentorship programs • Diverse recruitment campaigns	$100k
	Total:	**$1.05m**

Workforce Development efforts will complement programmatic activities aimed at increasing the adoption of advanced technologies. In the commercial and industrial sector, this includes training on advanced controls for HVAC and lighting and growing the commissioning workforce. To support the residential and income eligible sectors, the Company will build relationships with schools and communities to help grow the constrained pipeline of trades that enable energy efficiency projects like HVAC technicians (including heat pump installers), electricians, and plumbers.

These efforts vary in how they relate to energy savings claimed in this Plan. While some of these efforts, such as BOC training, contribute directly to energy savings per our TRM, other efforts are intended

purely to increase volume and/or depth of savings captured. In the former case these efforts will be evaluated as usual, while in the latter case they will not be evaluated for energy savings at this time.

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 by 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, HVAC optimization, and information on National Grid's energy efficiency programs.

In 2021, the Company plans to support Building Operator Certification (BOC) training by holding one Level I BOC class in Rhode Island and one Level II BOC class in Massachusetts. The audience includes facility managers, operating engineers, building technicians, and maintenance mechanics, with the average class size usually ranging between 20 and 30 students. The Company will investigate opportunities to deliver these trainings online.

In addition to the classroom training, National Grid also sponsors BOC webinars for customers and staff. The webinars are on specific topics of interest to facility managers.

Advanced Workforce & Channel Development

Online Trade Ally Training on Advanced Lighting Systems

Online Trade Ally targeted training, for the Performance Lighting PLUS program, consolidates the best-of-class subject-matter expertise into one common platform with an electronic training program built to track the progress of participants. This online, on-demand learning platform complements face-to-face and webinar-based education and is a proven way to meet the time demands of all trade allies. This online learning platform will provide efficient and effective education on Advanced Lighting Systems including controls and design. This online training is developed to increase program participation and improve program process. This training will target trade allies (ESCOs contractors), internal sales teams, vendors, architects, designers, manufacturers' representatives, distributors and customers. The Online Trade Ally training platform was launched in 2019 and will continue in 2021. The platform is managed by a vendor, who will also track participation through the online training platform.

Table 11. Overview of Online Trade Ally Training Platform

Utility Benefits	Trade Ally Benefits
• Automates onboarding tasks	• Offers training access organization-wide
• Deploys program changes faster	• Educates all staff to increase project sales

• Pushes fresh content to engage allies	• Affords on-demand training when needed
• Provides metrics for ally tiering programs	• Offers accredited CEU and certifications
• Shares in industry-provided content	• Aligns real-time trainings with program changes
• Uses portal customized with utility branding	• Recognizes achievement with rewards
• Increased energy savings from knowledgeable trade allies	• Reports real-time metrics to track progress

3.5 Participation

Each program described in this Plan seeks to drive customer participation 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 2021, 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 the number of customers who benefit from efficiency programs. Planned participation estimates are included in Attachment 5 Electric EE Program Tables, Table E-7 and Attachment 6 Gas EE Program Tables, Table G-7.

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

Table 12. 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
		Multifamily	Housing Units
		Home Energy Reports	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
		Commercial ConnectedSolutions	Unique Billing Account
	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
		Multifamily	Housing Units
		Home Energy Reports	Unique Billing Account
		Residential New Construction	Housing Units
		ENERGY STAR® Lighting	Estimated Housing Units

		Residential ConnectedSolutions (Direct Load Control)	Unique Billing Account
		ENERGY STAR® Products	Number of Rebates

The Company will 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 2021. This method allows for a better estimation of unique participants but can make it more difficult to compare planned numbers across years.

In 2021, 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 small business 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 by promoting products upstream and through 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 Company energy efficiency programs.

The Company has made steady progress with reaching new participants each year. From 2012-2019 the Company served approximately 38% of its electric customers and 27% of its gas customers from its targeted programs at least once (this analysis has removed duplicate participation across programs and across years from 2012-2019). When Home Energy Reports and C&I upstream lighting participation are added to these counts, a total of 89% of electric customers and 82% of gas customers participated over this period. Home Energy Reports are included here because the program offers significant savings and benefits to customers as well as drives customers to participate in other energy efficiency programs. Planned 2020 and 2021 participants are also included in these totals for illustrative purposes. Importantly, planned participants in 2020 and 2021 may have participated in prior years. In the 2021 Year-End report, the Company will remove any participation overlap to report unique 2021 participants. See 2019 year-end report for further details on participation through 2019.

In 2021, the Company will continue its efforts to reach customers that have never participated in its energy efficiency programs. The Company will also continue its efforts to reach customers that have previously participated in its energy efficiency programs but who can still benefit from the installation of additional energy efficiency measures. Many unique participants are still eligible for additional programs. For example, a participant in the EnergyWise Single Family program may participate in the HVAC program. The Company will continue to deliver innovative strategies to increase customer participation and reach customer segments that are historically underrepresented. Also, the Company

will continue to track participation trends and will again provide a detailed analysis in its 2021 Year-End Report showing additive and cumulative portfolio participation.

4. Pilots, Demonstrations and Assessments

In accordance with Docket 4600-A PUC Guidance Document, this Plan includes a description of Commercial, Industrial, and Residential pilots, demonstrations and assessments in Attachment 8. Please refer to Attachment 8 Pilots, Demonstrations & Assessments for additional detail.

As defined in the Docket 4600-A Guidance Document, "A pilot is a small scale, targeted program that is limited in scope, time, and spending and is designed to test the feasibility of a future program or rate design. It is incumbent upon the proponent of a pilot to define these limits in a proposal for PUC review. Ideally, a pilot can provide net benefits and achieve goals, but the primary design and value of a pilot is to test rather than to achieve."[30] Pilots are designed to explore technologies and approaches to energy management not included in the core energy efficiency programs (Residential, Commercial and Industrial, and Multifamily) and that could potentially become a new, standalone program.

Pilots enable the Company to test technologies, new energy management strategies, customer adoption, workforce adoption, and cost effectiveness of emerging and new technologies. While pilots are designed to test standalone programs, pilot results may conclude that a standalone program is not recommended or that certain aspects of the pilot should be offered within existing programs. It is likely that pilots will require a long-term commitment and broader set of stakeholder input, given the scope of adding a new core program to the Company portfolio. Savings associated with Pilots will not contribute to shareholder incentives. Pilots may be evaluated with either an independent or a vendor evaluation.

For actions in this Plan that do not fall under Docket 4600-A PUC Guidance Document's definition of pilots, the Company includes demonstrations and assessments within the programs. A demonstration will test the feasibility of a new product or offering for inclusion in existing programs. It is generally expected that demonstrations will be less time and resource intensive than pilots, since generally there is greater certainty around a narrow, incremental idea added to a program rather than a totally new set of offerings. Savings associated with demonstration projects may contribute to shareholder incentives. Demonstrations may be evaluated with either an independent or a vendor evaluation. An assessment will be deployed for solutions that address a particular gap or program need, but have significant uncertainty around the effectiveness or potential of the solution to realize savings. Because of the uncertainty, assessments will not include field demonstrations or customer installations. Instead, assessments will focus on information gathering to equip Company staff to make a more informed decision of whether and how to proceed with the idea. It is possible that an assessment could recommend further demonstration of the idea or determine the solution should exit the review process.

[30] Docket 4600-A PUC Guidance Document, October 27, 2017. Section V. Pilots.

Savings associated with assessments may not contribute to shareholder incentives. Assessments may be evaluated with an independent evaluation, vendor evaluation, or internal review.

The Company will continue to seek out opportunities to identify, test, analyze, and deliver new creative and innovative solutions and services that are technically feasible, desirable by customers, and viable for inclusion in the portfolio. The Company plans to explore logical program extensions like new or substitute measures, adaptations to program or delivery approaches to drive incremental improvement, and completely new offers. The Company will use evaluation studies, customer and market research, the Market Potential Study, and stakeholder feedback to identify areas for potential exploration and will prioritize efforts based on likelihood of success, speed of development, and program need. Each customer segment and savings technology has unique barriers to adoption and will be assessed on a situational basis.

National Grid has established a team that works within New England jurisdictions to identify and develop potential new measures, approaches, and solutions to compliment or grow programmatic offerings in efficiency, demand reduction, or optimization. In addition to a reactive response to new product and technology ideas, the Company is also proactive, participating in regional and national groups, maintaining relationships with efficiency program administrators (PAs) in other jurisdictions, and following national research. National Grid will use our regional footprint to attract and explore as many of these diverse ideas for new products, efficiency measures, demand reduction approaches, or optimization opportunities as possible. The Company will coordinate efforts with internal and external stakeholders, such as Evaluation, Measurement, and Verification (EM&V), Customer Energy Management (CEM), OER, and EERMC, at various points in the development process to ensure appropriately rigorous evaluation and attention is given to each pilot, demonstration, and assessment. Updates will be provided to OER and the EERMC consultant team on a quarterly basis and will solicit input during the Company's collaborative annual planning process.

The Company will continue to systematically review opportunities to add to the portfolio through a consistent and transparent process. Please refer to Attachment 8 for details on evaluations for pilots, demonstrations and assessments.

5. Evaluation Measurement and Verification Plan

To verify the impacts of programs on energy savings, the Company hires independent third-party consulting firms to regularly conduct evaluation studies as part of its evaluation, measurement, and verification process. These evaluations incorporate industry standard methods such as engineering analysis, metering analysis, billing analysis, site visits, surveys, and market studies to realize the actual energy savings of a particular measure. The EERMC and OER provide direct oversight of each evaluation study conducted. Every year, the results of the studies are used to update the benefit-cost calculations during planning. Attachment 3 EM&V Plan lists the evaluations that have occurred since 2007 that are still being used and their influence on program planning. All completed evaluations are submitted

electronically to the PUC; final reports of evaluations completed in prior years are available in the dockets for previous years, on the EERMC website[31], or upon request.

Additionally, the EM&V Plan for 2021 is presented in Attachment 3 and includes brief descriptions of each of the proposed studies. The areas proposed for study in 2021 were 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, recommendations from previously completed studies, 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.

6. Coordination with Other Energy Policies and Programs

6.1 System Reliability Procurement

The Company will submit its System Reliability Procurement (SRP) 2021-2023 Three-Year Plan for the PUC's review and consideration in a separate filing, to be filed in November 2020. The SRP Three-Year Plan describes the strategies, goals, and funding request for SRP. The purpose of SRP is to identify targeted alternative solutions, through customer-side and grid-side opportunities, for the electric and gas distribution systems that are cost-effective, reliable, prudent and environmentally responsible and chart a path to lower supply and delivery costs for customers in Rhode Island.

The SRP Plan and its Non-Wires Alternative (NWA) proposals are separate and unique from the Energy Efficiency Plan customer measures because NWA projects are targeted solutions for electric grid reliability, as compared to energy efficiency's goal of bulk energy savings from customers for the regional electric grid. These two main distinctions are illustrated by a difference in scope of area (i.e. feeder- or substation-level for SRP versus state or regional for energy efficiency), and in scope of intent (i.e. electric grid reliability for SRP via NWA projects versus energy savings via energy efficiency measures and programs). In addition, in the 2021-2023 SRP Three-Year Plan, the Company will introduce efforts to address Non-Pipeline Alternatives for the first time by performing further background research on NPAs, exploring how NPAs align with Company policy and the LCP Standards, and building out the NPA program over the three years.

The Company continues coordination between SRP and customer offerings in the Energy Efficiency Plan to ensure that efforts, projects, and programs are optimal and not duplicated. As is the practice now and going forward, energy efficiency and demand response are examined during National Grid's distribution planning process as part of the development of NWA opportunities. This assessment of energy efficiency

[31] https://rieermc.ri.gov/plans-reports/evaluation-studies/

and demand response for NWAs occurs before the Company goes out to market with requests for proposals (RFPs) for solution bids from third-party solution providers. Energy efficiency or demand response may be deployed as part of an NWA solution so long as the targeted energy efficiency or demand response programs are least-cost, cost-effective, reliable, and technically feasible for the electric system need. The Company ensures cost-competitive utilization of targeted active DR by evaluating market prices and comparing third-party active demand response proposals to the incremental costs of targeted active DR which would build upon National Grid's existing ConnectedSolutions program.

Additionally, the Company also coordinates communications between the SRP Technical Working Group and the Energy Efficiency Technical Working Group, with members of each team participating in counterpart TWGs. The Company will also work with these groups and the PUC on changes in filing schedules to better align the SRP filing with the Infrastructure, Safety and Reliability (ISR) filing.

Continuing to provide the best value to Rhode Island ratepayers necessitates that the Company coordinate with other parts of the energy system, rather than pursuing savings programs and strategies in isolation. This Annual Plan will be implemented in coordination with other Company filings and activities, described below. Efforts have also been taken to ensure the Annual Plan is aligned with relevant state policies and objectives, with specific coordination opportunities detailed below.

6.2 Heating Sector Transformation and National Grid's Northeast 80x50 Pathway

In an Executive Order issued on July 8, 2019, Governor Raimondo directed the Division of Public Utilities and Carriers (DPUC) and Office of Energy Resources (OER) to lead a Heating Sector Transformation (HST) with the goal of reducing emissions from the heating sector while ensuring Rhode Islanders have access to safe, reliable, and affordable heating. The HST recommendations were to be provided to the Governor by April 2020 and identify the energy, economic, and environmental opportunities and challenges posed by Rhode Island's heating sector in the face of a rapidly changing climate.[32]

The HST initiative resulted in an analysis conducted by the Brattle Group, on behalf of the DPUC and OER, outlining several solutions for decarbonizing the heating sector, described in the April 2020 report "Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050."[33] The report summarized opportunities in three broad categories relevant to the Company's efficiency planning: (1) reducing energy needs by improving building energy efficiency; (2) replacing current fossil heating fuels with carbon neutral renewable gas or oil; and (3) replacing current fossil-fueled boilers and furnaces with electric ground source or air source heat pumps powered by carbon-free electricity.

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[32] Executive Order 19-06, https://governor.ri.gov/documents/orders/Executive%20Order%2019-06.pdf
[33] Heating Sector Transformation in Rhode Island, Pathways to Decarbonization by 2050. http://www.energy.ri.gov/documents/HST/RI%20HST%20Final%20Pathways%20Report%204-22-20.pdf

Additionally, in June 2018, the Company released the Northeast 80x50 Pathway[34] (Northeast Pathway) whitepaper that highlights National Grid's approach to reduce greenhouse gas emissions below 1990 levels while supporting economic growth, maintaining affordability, and providing customer choice. The Northeast Pathway and HST are aligned in several key areas related to energy efficiency, including the need to transform heating, in part, by increasing rates of efficiency retrofits and deep conversions of delivered-fuel heat to electric heat pumps.

Efforts in support of HST and the Northeast Pathway in this Annual Plan will include a continued focus on weatherization and building efficiency to prepare for efficient heating system replacement in the future. Going forward, the Company will continue to work with the state to analyze the steps needed to further the second two heating sector transformation objectives and the electrification transitions identified in the Company's Northeast Pathway analysis.

6.3 Heat Pump and Delivered Fuel Policy and Objectives

Per the PUC's ruling on the 2020 Annual Energy Efficiency Plan in Docket 4979, the Company may not offer incentives for electrification of heating for delivered fuel customers in 2020. The Company will not offer incentives for these measures in 2021 and will continue to pursue opportunities to engage, including supporting OER's efforts to advance the heat pump market and supporting weatherization for delivered fuel customers. The Company looks forward to working with stakeholders and policy makers to identify the appropriate role and funding mechanisms for an electric utility to play in this transition and then executing on an approved pathway. In addition, pending availability of Regional Greenhouse Gas Initiative (RGGI) funds, we plan to combine our delivery pathways and standard air source heat pump (ASHP) incentives with RGGI-fund supported enhanced incentives for delivered fuel displacement in the near term until a more permanent mechanism to support these offerings is possible.

6.3.1 Heat Pump Implementation and Education

The programs and strategies included in this Annual Plan will support the installation of heat pumps for heating and cooling for customers that utilize electric resistance heating. In an effort to further develop this market, the Company will continue to seek ways to educate consumers and installers on the associated cost savings from efficient heat pumps as compared to electric resistance heating. The Company will coordinate its efforts with state agencies to realize the opportunities related to heat pumps identified in the Heating Sector Transformation report and Company's Northeast Pathway study described in Section 6.2.

6.3.2 Delivered Fuels

The Company supports the state's objective to provide energy efficiency for delivered fuel customers and is working to serve these customers in multiple ways. Income-eligible customers in single-family and multifamily homes receive the same services as electric and gas customers, with no customer-incurred

[34] National Grid's Northeast 80x50 Pathway, https://www.nationalgridus.com/News/Assets/80x50-White-Paper-FINAL.pdf

costs. The Company plans to continue these services during 2021. For non-income eligible delivered fuel customers in single family (one- to four-unit) and multifamily (five-plus unit) homes, the Company will continue to support weatherization, with financing available via the Heat Loan no-cost to the customer financing option.

The Company will not offer additional energy efficiency surcharge funded incentives for customers to convert from delivered fuels to heat pumps per the aforementioned PUC ruling in Docket 4979; however, National Grid will continue to seek ways to support the state, including OER, in providing opportunities for delivered fuel customers to utilize efficient heat pumps for their heating needs. For example, the Company will coordinate with OER to support use of RGGI funding to offer enhanced heat pump installations for customers using those systems to displace the use of delivered fuels.

6.4 Power Sector Transformation

Governor Raimondo tasked the PUC, OER, and DPUC with developing a new regulatory framework for the state's electric system, which resulted in the Rhode Island Power Sector Transformation (PST) initiative in Dockets 4770 and 4780.[35] This initiative consists of four parallel work streams: 1) utility business model, 2) distribution system planning, 3) grid connectivity functionality, and 4) strategic electrification of transportation and heating. The Company will continue to incorporate outcomes of this initiative into the subsequent Annual Plans. This includes the Company's active demand response program, which will begin educating customers on real-time management of energy consumption to prepare them for future tools that may be available through grid modernization. These efficiency programs are planned in coordination with the Company's advanced metering functionality (AMF) and grid modernization efforts, discussed subsequently.

6.4.1 Advanced Metering Functionality and Grid Modernization

In addition to its energy efficiency planning, the Company also has teams actively working on grid modernization plans (GMP) and AMF. These three teams work closely to ensure the Company has a comprehensive view of the benefits and impacts of the potential roll out of grid modernization and AMF. These programs will provide increased visibility into customer usage (from AMF) and insights into the operation of the local distribution system (from grid modernization investments, including AMF). This will allow for improved efficiency program marketing, more personalized savings offers, more targeted measure deployment, and optimization of demand side resources. The Market Potential Study included scenario analysis that explored the impact of AMF and time-of-use rates on energy efficiency programs, specifically demand response programs.

The Company is in the process of initiating a GMP and AMF proceeding in Fall 2020. The Energy Efficiency team will continue to coordinate with the GMP and AMF teams to ensure that the Company has a comprehensive view of the benefits and impacts of the potential roll out of grid modernization and AMF. Specifically, the Company is working to ensure that the benefits estimated in the GMP and AMF

[35] RI PUC Docket 4770: http://www.ripuc.ri.gov/eventsactions/docket/4770page.html
RI PUC Docket 4780: http://www.ripuc.ri.gov/eventsactions/docket/4780page.html

Benefit Cost Analyses (BCA) would constitute a new baseline of savings upon which future energy efficiency goals are based and to ensure energy savings are not double counted. In addition to the calculation of benefits, the Company will also examine any possible overlap of costs.

If AMF is launched, the Company still anticipates energy efficiency programs would continue to offer customer incentives for in-home/in-business technologies, such as Wi-Fi programmable thermostats and smart appliances to drive the achievement of additional incremental energy savings to meet annual energy savings targets. The Company recognizes that the future energy efficiency plans would include the total participant costs (i.e., ratepayer-funded rebates and customer contribution costs) associated with such measures in its BCA methodology.

While the Energy Efficiency, GMP, and AMF teams have been coordinating closely through the filing process, the need to bifurcate savings and costs associated with these plans would not arise unless grid modernization and AMF investments are approved, deployment begins, and data is collected and visualized for customers in later years. Therefore, the energy efficiency team anticipates that should the PUC approve AMF, the important overlap and distinction between GMP, AMF, and energy efficiency would most likely not arise until after the period covered by this Annual Plan. At that point the Company anticipates undertaking a more robust discussion of evaluation methodologies and other key considerations. In the interim, the Company will continue to work with the TWG to ensure all stakeholders are aware of any future transition.

6.5 Rate Cases

The energy efficiency program teams will continue to coordinate with the electric and gas businesses as they develop new rate cases during the term of the Annual Plan. For example, the Company currently earns a performance incentive for Annual MW Capacity Reduction from active electric demand response that was included in an electric rate case. In the future, the Company may revisit whether this PIM is more appropriate to include as part of annual energy efficiency programs rather than a rate case.

6.6 Integration with Renewables

As Rhode Island moves toward a clean energy future per Governor Raimondo and the General Assembly, National Grid will work to better integrate its energy solutions offerings. In addition to energy efficiency and demand response, this includes electric vehicles, renewable technologies, and battery storage. National Grid will work to create a seamless experience for the customer to select from these diverse solutions. As demonstration of these technologies and programs is necessary to determine effectiveness, benefits, and ease of use, this will require continued work to align Company funding for efficiency and the current renewables programs (net metering, and Renewable Energy Growth). Working with both internal and external stakeholders, the Company will identify new opportunities to enable the delivery of, and benefits from, integrated energy efficiency and renewable solutions.

6.7 Codes and Standards Program and Accounting for New Codes and Standards

Accelerating the state's adoption of, and compliance with, residential and commercial building energy codes helps ensure that energy efficiency is incorporated into buildings when it is least costly – at the

time of construction or alteration. The Company has operated a Code Compliance Enhancement Initiative (CCEI) since 2013, one of the country's only utility programs of its kind. From 2019-2020, the Company also provided technical support to the state's energy code update process for the first time. Both code compliance and development support activities will continue in the next three years, with the latter scaling up to build upon the 2019-2020 demonstration.

As Rhode Island adopts more stringent energy codes and transforms the new construction market, the Company will continue to support the state's aggressive energy policies in promoting the next-generation building sector. The Company will continue to work with state and local building departments and OER to update and implement the state's residential and commercial stretch codes. The CCEI initiative will offer trainings and assistance related to promoting compliance with the stretch code as well as preparing the market for the zero-energy building future. The initiative will also investigate opportunities to support increased use of the stretch code.

The Company will also continue to work with OER, the Appliance Standards Awareness Project (ASAP), and Northeast Energy Efficiency Partnerships (NEEP) to provide technical support for the adoption of state-level appliance standards and investigate providing analogous support of federal appliance standards.

7. Multi-Year Strategies

In the revised LCP Standards adopted by the PUC in Docket 5015, the PUC directed the Company to identify investment strategies for which implementation and budget requests (or revenue collection) are expected to span multiple years. In addition to the budgets and targets required for the rest of the portfolio, the PUC directed that the Company may separately provide budgets and goals for multi-year strategies. The requirement applies to both the Annual and Three-Year Energy Efficiency Plans. While the Company is not making specific requests for separate, multi-year budgets or targets within this Annual Plan, the Company does believe, as indicated in the concurrent 2021-23 Three-Year Plan filling, that there is value for stakeholders in identifying two specific programmatic areas, Combined Heat and Power and support for the Rhode Island Infrastructure Bank (RIIB), that warrant specific "multi-year strategy" discussion. This subsection identifies and expands upon these two areas of focus.

7.1 Combined Heat and Power

In the 2021 Commercial and Industrial Electric Energy Efficiency Program, the Company proposes to continue to offer incentives for the installation of Combined Heat and Power (CHP) projects. The CHP offering is a component of the Large Commercial and Industrial Retrofit program. CHP projects tend to have longer development periods than other energy efficiency offerings and are frequently individually large enough that changes to specific project timing can have a material impact on annual budgets and achievement of annual savings goals. As such, the Company believes these projects warrant specific discussion within the Multi-Year Strategies section of this Annual Plan filing.

For CHP projects, a maximum of 80% of the energy efficiency incentive payment and project savings are withheld until after the project has been interconnected and post-inspected. A minimum of 20% of the

energy efficiency incentive payment and project savings are withheld until the project has been commissioned. The energy efficiency incentive payments and project savings can span multiple years depending on the post-inspection date and project complexity. For these reasons the Company considers CHP projects to fit within multi-year strategies.

The following table includes the initial budget estimates and preliminary savings values for a 600 kW CHP project that is expected to span multiple years and anticipated for the 2021 and 2022 program years. The savings and associated costs for the CHP measure are included in the Large C&I Retrofit program in all tables and figures in this Plan. For additional information on combined heat and power, refer to Attachment 2 C&I Programs, Section 5.14.

Table 13. Multi-Year CHP Proposed in the 2021 Annual Plan

CHP Nameplate Capacity	2021			2022		
	Gross Annual Savings (kWh)	**Gross Lifetime Savings (kWh)**	**Incentive Payment**	**Gross Annual Savings (kWh)**	**Gross Lifetime Savings (kWh)**	**Incentive Payment**
600 kW	2,188,000	43,760,000	$513,000	548,000	10,960,000	$120,000

7.2 Rhode Island Infrastructure Bank (RIIB)

In 2021, as in prior years, the Company proposes to make a transfer to the Rhode Island Infrastructure Bank (RIIB) in order to continue to support the Efficient Buildings Fund (EBF) revolving loan fund.[36] As noted on the RIIB website:

> The Efficient Buildings Fund (EBF) provides attractive, long-term financing to municipalities and quasi-public agencies for the completion of energy efficiency and renewable energy projects. EBF seeks to finance energy retrofits in public buildings that will result in electric and heating savings greater than 20% across all properties receiving improvements. To date, the Infrastructure Bank has made ~$20.5 million in loans through the Efficient Buildings Fund.
>
> Eligible properties include municipal buildings, schools, publicly-owned utilities, such as wastewater or drinking water facilities, and quasi-state entities. Financing can be repaid over terms of up to 15 years and can be structured to provide annual cash-flow savings to the borrower. The Rhode Island Office of Energy Resources (OER) is the Bank's regulatory partner for the program. For a project to be eligible for financing, it must first

[36] Rhode Island Infrastructure Bank Efficient Buildings Fund: https://www.riib.org/ebf

be placed on OER's Project Priority List (PPL). OER ranks and scores project applications based on transparent scoring criteria, which results in the production of a PPL at least once annually.

For 2021, the Company has included estimates of savings in its binding savings and budget goals that are anticipated to be associated with projects that will both be financed through EBF and fully realized and claimable within the calendar year. If all projects in the current pipeline provided by RIIB with a 2021/2022 completion estimate were completed in 2021 (see Attachment 2 C&I Programs, Table 11 Forecasted 2021 Pipeline Loan Descriptions Savings) and were able to be claimed by National Grid within the term of this Annual Plan, it would result in 11,700 gross annual MWh savings in 2021. However, working with municipalities, state agencies, and quasi-state agencies can introduce approval and delivery timing challenges that are not frequently observed in other market segments, including long municipal approval times and resolving legal issues surrounding street lighting. Even financed projects are also subject to public entities receiving funding approval. In the case of municipalities, this often requires the residents of these communities to approve bonds. Due to these challenges, the Company believes that spreading out the estimated 11,700 gross MWh of savings (and associated incentives) across three years represents the most likely reflection of when associated savings will be claimable. This does not mean that these entities would not borrow from RIIB in 2021, or that RIIB would not require requested funding from the Company within 2021; rather, it means that the Company does not believe it is likely to be able to claim the bulk of these savings in 2021.

More details are available in the corresponding Multi-Year Strategies section of the Three-Year Plan. For reference, the anticipated gross savings in RIIB's pipeline were allocated as follows.

Table 14. Anticipated Gross Savings in RIIB Pipeline

Year	Gross MWh	Incentives
2021	1,000	$295,000
2022	8,025	$2,510,688
2023	2,675	$876,063
Total	11,700	$3,681,751
	Gross MMBtu	**Incentives**
2021	3,000	$59,773
2022	10,000	$224, 242
2023	6,000	$167,643
Total	19,000	$451,658

Table 15. Anticipated Savings from EBF-funded Projects in 2021 - Electric

Program	Measure	Annual Net Savings (kWh)	Lifetime Net Savings (kWh)	Incentive
Large C&I Retrofit	Street Lighting (Custom)	306,726	6,134,520	$105,000
C&I New Construction	HVAC (Custom)	136,071	2,041,061	$132,500
C&I New Construction	Lighting (Custom)	177,517	2,662,748	$57,500
Total		**620,314**	**10,838,329**	**$ 295,000**

Table 16. Anticipated Savings from EBF-funded Projects in 2021 – Gas

Program	Measure	Annual Net Savings (MMBtu)	Lifetime Net Savings (MMBtu)	Incentive
Large C&I Retrofit	Custom	2,340	18,718	$41,148
Large C&I Retrofit	Controls	544	8,160	$11,000
C&I New Construction	Custom	242	4,122	$7,625
Total		**3,126**	**31,000**	**$59,773**

CONSISTENCY WITH STANDARDS

8. Least Cost Procurement Law and Standards

This Annual 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 Least Cost Procurement Standards as approved and adopted pursuant to Order No. 23890 in Docket No. 5015. The Standards guide how energy efficiency services are delivered – in a manner that is optimally cost-effective, reliable, prudent, and environmentally responsible. Least-Cost Procurement that is Energy Efficiency and Conservation Procurement shall also be lower than the cost of additional energy supply.

The Company has assessed each of these requirements in developing this Plan. Details on the Company's approach to considering each of these elements are included in this section. In addition, further detail on the cost-effectiveness screening of the proposed investments is in Attachment 4 RI Benefit Cost Test, with detail on rate and bill impacts in Attachment 7.

8.1 Prudency

Over the course of its history implementing energy efficiency programs in Rhode Island, the Company has considered and continues to consider several key components in the analysis of prudency. These components can be summarized as considerations of:

- How the investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement and what the potential for synergy savings may be based on alternatives that address multiple needs.
- What groups of customers can the Company reach with program offerings? How can we ensure that all customers are served equitably and share in the cost of energy efficiency?
- What impacts to customer rates and bills will be required to deliver the efficiency goals, and how can those impacts be mitigated through alternative funding? What risks, if any, will customers and the Company see from the investments in energy efficiency and conservation procurements?
- What constraints, such as available workforce and prevailing economic conditions, exist in the marketplace that may impact the achievement of the goals as developed and proposed in the Plan?

For the proposed investments detailed in this Plan, the Company has assessed each of these elements and how they can be balanced to provide a comprehensive set of programs that will be achievable within known and anticipated constraints.

8.1.1 General Considerations of Prudency

One of the very first considerations of Prudency within the Standards is that the Company assess how an investment supports the goals of the electric or natural gas system and the purposes of Least Cost Procurement. This plan secures cost effective energy efficiency resources that drive the realization of benefits as enumerated in the Rhode Island Test including Electric Energy Benefits, Electric Generation Capacity Benefits, Electric Transmission Capacity and Distribution Capacity Benefits, Natural Gas Benefits, Fuel Benefits, Water and Sewer Benefits, Non-Energy impacts, Price Effects, Non-embedded Greenhouse Gas Reduction Benefits, Economic Development Benefits, Non-embedded NOx Reduction Benefits, and Value of Improved Reliability.

As an example of the way that the proposed investments in this plan address multiple needs, the electric demand response program continues to grow in magnitude of savings and in offerings while utilizing channels and technologies that drive not only energy savings but also reduced cost and deferred infrastructure benefits that flow from reducing peak demand.

In aggregate the portfolios included in this plan submission are robustly cost effective, as the benefits exceed the costs to acquire the efficiency resources and implement the programs. The electric portfolio achieves a BC Ratio of 4.31 and the gas portfolio achieves a BC Ratio of 3.00.

Furthermore, the cost of procuring 1,306,562 MWh lifetime electric energy efficiency savings through the Plan is $121,277,547 less than if that electric load was met by purchasing additional electric supply. The cost of procuring 4,206,444 MMBtu lifetime natural gas energy efficiency savings through the Plan is $14,186,986 less than if that natural gas load was met by purchasing additional natural gas supply.

Finally, in leveraging anticipated year-end 2020 fund balances resulting from recent COVID-19 related barriers to customer program participation, the Plan supports a continued commitment to aggressive savings goals and maintains momentum within the Rhode Island energy efficiency market, without requiring 2021 increases in the energy efficiency surcharges.

8.1.2 Equity

The Company defines equity in energy efficiency programs as ensuring that all customers have equal ability to access and benefit from its programs, regardless of their geographic location in Rhode Island, income, home ownership status, primary language, business size, or other attributes. This involves considering how programs are designed and evaluated with this definition of equity in mind, as well as taking into account the systemic and institutional structures that may make it easier for some customers to access energy efficiency products and programs more than others.

The portfolio of programs and offerings included in this 2021 Annual Plan represent a continuation of this approach, with a comprehensive set of offerings that provide pathways for all customers to take part in energy efficiency offerings and realize benefits. To further ensure that the programs and offerings are equitable in light of changed requirements in the LCP Standards and increased interest and

focus from stakeholders, the Company proposes several steps to further quantify various metrics related to equity in order to establish baselines for measuring performance in the future.

Firstly, beginning in early 2021, the Company will work with OER to start an equity working group to further refine areas of focus. At this point, OER and National Grid envision the working group to be comprised of representatives from OER, other state agencies, National Grid, community-based organizations, advocacy organizations, and local subject matter experts in equity. The working group will be a key resource for the Company as it develops future annual plans and further studies equity through a number of evaluation efforts. A first task for the equity working group will be to interpret recently-completed Massachusetts non-participant studies[37] to gather lessons learned from similar programs.

Next, the Company will initiate several studies to better understand historic customer participation and the extent to which geography, income, homeownership status, and primary language may be different among participants and non-participants (i.e. addresses that have not participated in any Company energy efficiency programs over a defined period of time). The Company's first step towards doing so will be to undertake a residential non-participant study to understand the attributes of non-participants and why they are not participating.[38] The study will provide in-depth research on non-participants to characterize customers that have not participated in energy efficiency programs, assess barriers to participation, and identify engagement opportunities. The study will use multi-mode customer surveys and in-depth interviews designed to understand non-participants' attitudes, needs and perceptions. The study will be a foundational analysis to understand any potential underserved customer groups. However, the Company does not view the study as the only source of data to inform discussions of equity in programs, though the information will be used as a primary source. The non-participant study is to be commissioned in early 2021, with anticipated completion in mid-2022, and will build on lessons learned from recently-completed Massachusetts non-participant studies.

In addition to the non-participant study, the Company commits to undertake a census of multifamily housing to understand multifamily participation and non-participation.[39] National Grid will also track and report to stakeholders on renter participation in the in-home/unit assessment programs, and other programs as determined appropriate. The Company proposes to use data from the proposed evaluations to build program enhancements and tracking systems that are driven primarily by the needs of identified non- or low-participating groups, as well as additional marketing efforts better tailored to multilingual customers. However, the Company will explore options to prioritize the collection of data, not only from opportunities identified in these evaluations, but also based on input from the equity working group.

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[37] Residential Non-Participant Market Characterization and Barriers Study http://ma-eeac.org/wordpress/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf
[38] See Attachment 3 EM&V, Section 3.2c.
[39] See Attachment 1 Residential & IES Programs, Section 3 Multifamily and Attachment 3 Evaluation Measurement & Verification Plan, Section 3.2b.

In addition, the Company acknowledges the critical role that income plays in access to energy efficiency programs. It proposes to take further action in 2021 to enhance income eligible customer participation:

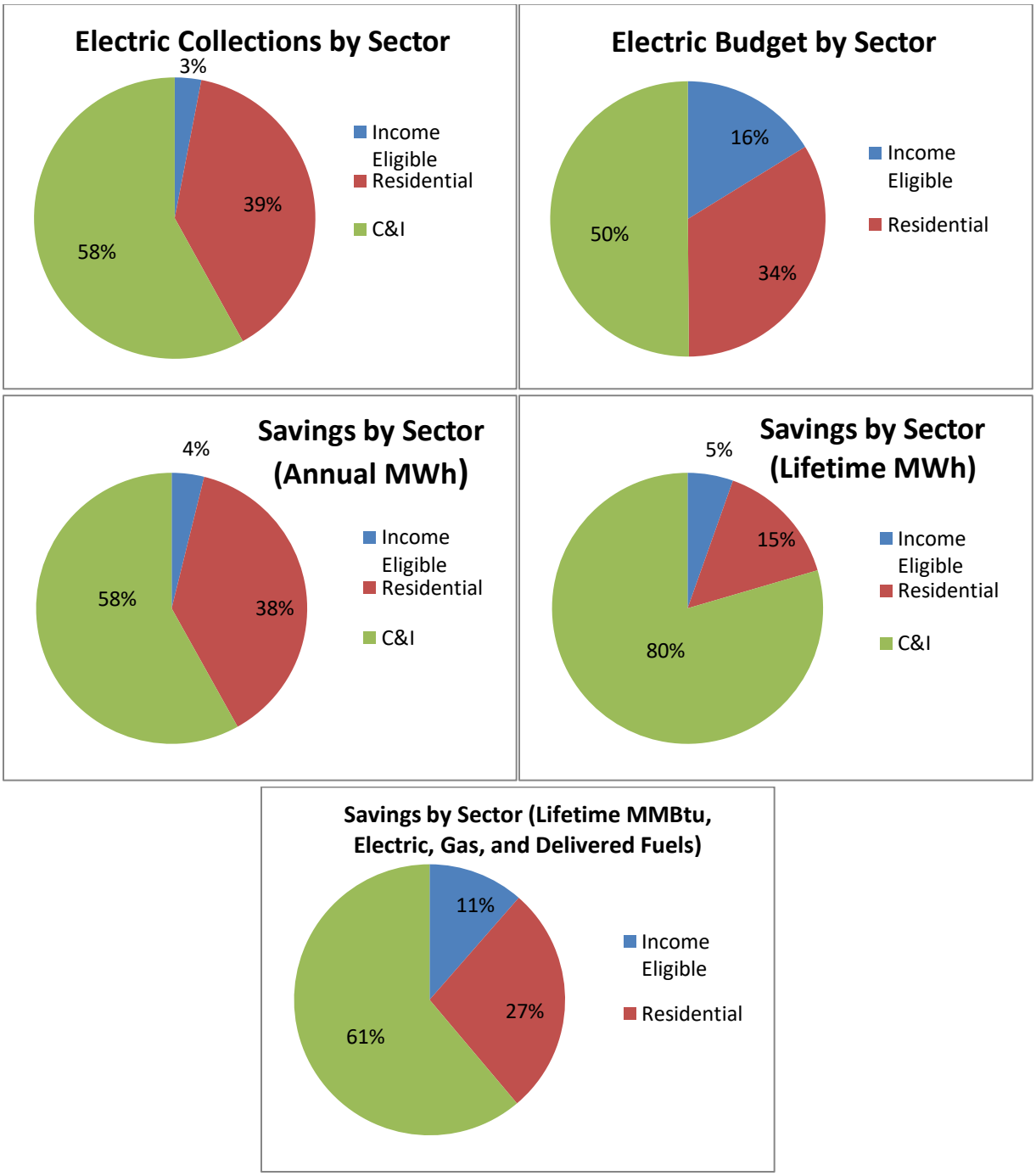
- The Company will increase its efforts and emphasis on identifying and encouraging customers eligible for the discount rate to move to the discount rate.
- As customers are brought into the discount rate, the Company proposes creating a welcome package to encourage participation in applicable efficiency programming, specifically Residential Income Eligible Services (IES).
- The Residential Consumer Products and Energy*Wise* Income Eligible Multifamily programs have partnered to streamline cooling solutions for income eligible customers living in multifamily properties.
- In the Company's workforce development programs, National Grid will work with stakeholders to identify communities from which it should focus on recruiting, training, and retaining talent, intentionally bringing more women and people of color into the energy efficiency workforce. This will create greater equity of access to the jobs generated by the clean energy transition and will help transition the workforce to better reflect the communities served. The desired outcome is to improve customer access and experience as customers find they are increasingly working with professionals from their communities and for these new professionals begin to identify and help the Company adjust delivery to overcome community access barriers.

The Company's new Codes & Standards advancement support program primarily targets the non-participant portions of the markets we serve across all sectors. While the program is in its infancy, this approach overcomes traditional barriers of access by ensuring efficiency levels are rising for all equipment and appliances.

8.1.3 Parity Among Sectors

In considering the prudency of the set of proposed investments contained in this Plan, the Company has also assessed the parity among sectors along dimensions of collections, budgets, and savings. As shown in Figure 4, there is approximate parity between the collections by a customer class and its resulting budget and savings in the electric portfolio. The only exception is the income-eligible sector where there is an established agreement amongst the Parties that the residential and C&I customer classes use part of their collections to help cover the income eligible sector funding needs. The income-eligible budget is higher compared to its savings due to several factors: incentives are 100% of the cost, the programs are more expensive because they are delivered in-home (compared to at retail sites or via rebates) which requires more labor and management, and the programs have fewer economies of scale (compared to C&I). $28.7 million is budgeted for the delivery of the gas and electric income eligible sector programs, 27% and 16% of the total funding for each fuel portfolio respectively in 2021. Taken together, these investments represent 19.0% of the overall electric and gas portfolio budgets compared to 18.3% of planned expenditures in the 2020 Annual EE Plan Budget. More information on the services offered through the income eligible sector programs can be found in Attachment 1 Residential & IES Programs, sections 3 and 4.

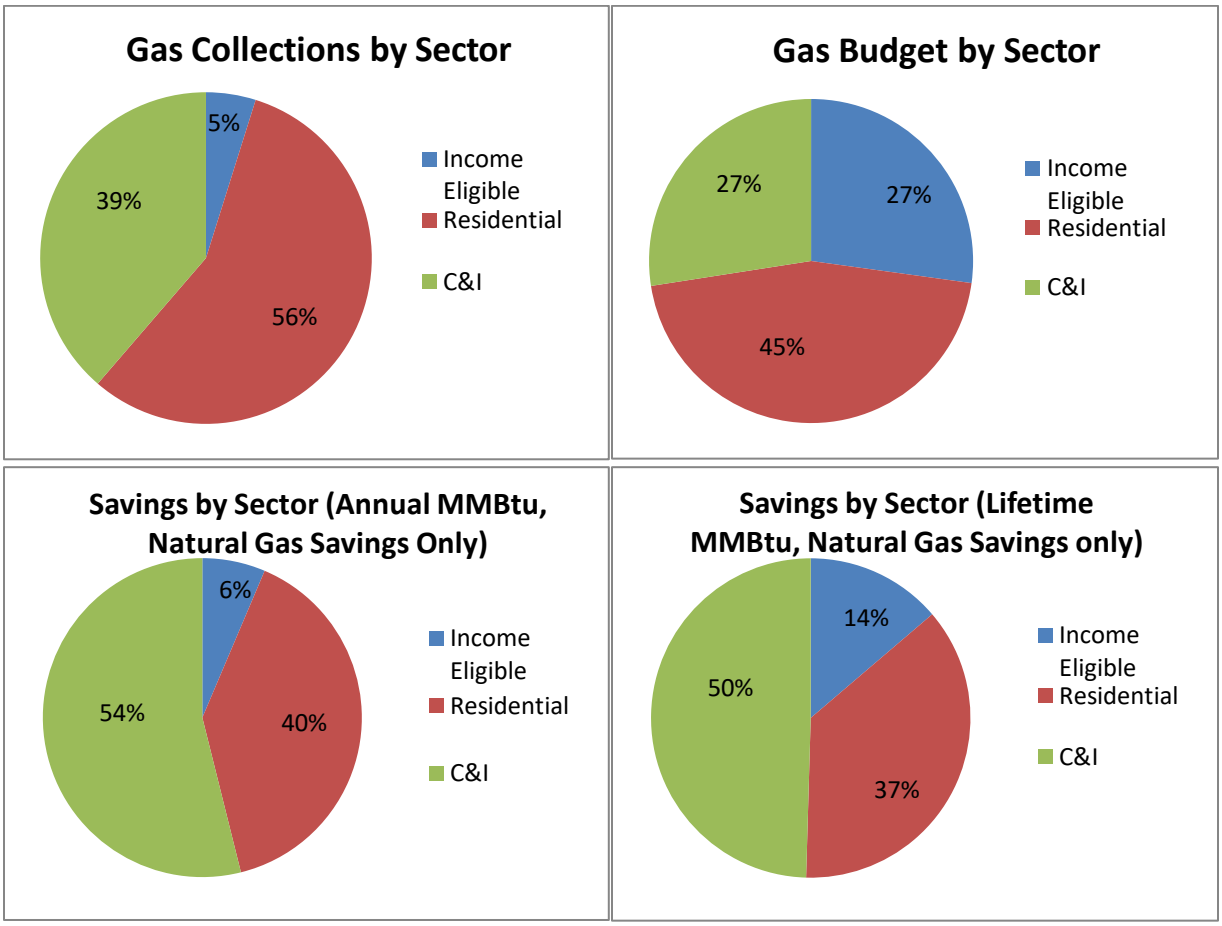
Figure 4. 2021 Graphical representation of Attachment 5 Table E-1 and total Electric Savings by Sector, Cumulative



For the gas portfolio, there is also parity between the collections by a customer class and the resulting savings. There is less parity between budgets and savings. This is due to several factors. First, the energy efficiency program charge varies by customer segment, which changes collections. Second, C&I projects tend to create more savings per dollar. This is due to larger economies of scale, larger projects, different

delivery channels that require less labor or management and are more cost-effective, evaluation factors such as free-ridership and spillover, and different customer opportunities.

Figure 5. 2021 Graphical representation of Attachment 6 Table G-1 and total Gas Savings by Sector, Cumulative



8.1.4 Rate and Bill Impacts

In addition to the cost-effectiveness of Rhode Island's investment in energy efficiency, National Grid has analyzed electric and natural gas rate and bill impacts from the proposed energy efficiency investments for the 2021 program year pursuant to the Standards. For several years, National Grid has analyzed the rate and bill impacts of the electric portfolio using a model that assesses the long term impacts to rates due to the presence of the annual energy efficiency portfolio in contrast to a counterfactual where the energy efficiency programs, and their corresponding upfront costs and savings over the duration of the measures' lives did not exist. In 2020, National Grid, in collaboration and consultation with the EERMC, OER, and the DPUC, undertook an effort to revise the rate and bill impact analysis for the gas portfolio to more closely align the modeling approach between the electric and gas portfolios. Synapse Energy Economics, who originally developed the electric bill and rate impacts model, was retained to develop the natural gas rate and bill impact model that is first applied in this Annual Plan and the concurrently filed Three-Year Plan. The new gas rate and bill impact model is closely aligned with the existing electric

model in that it shows the change in long term rates and bills due to the presence of the energy efficiency programs in contrast to a counterfactual where the energy efficiency programs were not in place. While the methods are largely aligned between the electric and natural gas portfolios, there are key differences between the analyses, including the presence of avoided costs for transmission and distribution in the electric models. Additional detail on the methods and results from both models are provided in Attachment 7, Rate & Bill Impacts.

The rate and bill impacts conducted for this Plan provide one quantitative data point in determining the merits of the investment in energy efficiency overall. The rate and bill impact estimates are considered in conjunction with the robust benefit cost analysis conducted on measures, programs, and portfolios included in this Plan and the analysis of the cost of alternative supply compared to the proposed energy efficiency investments. Summary results for the rate and bill impacts are included in the tables below, while additional detail is also available in Attachment 7 to this Plan.

Natural gas programs are projected to generate slight upward movement on long term rates between 0.3% and 0.7%. For the income eligible customer participants, the Small C&I participants, and Large C&I participants, modeling shows a reduction in bills between 1.16% and 7.12%.

With respect to the residential sector, the Company used three distinct model instances to explore the rate and bill impacts for this customer sector. The three residential model instances explored 1) the Home Energy Report (HER) program in isolation, 2) the EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Residential New Construction together (excluding HER program), and 3) All five programs together. It is important to note that each of these three parts of the residential sector analysis has been developed using a separate instance of the gas rate and bill impacts model. Attachment 7 provides additional detail on the modeling approach for this sector.

Relative to the other four residential programs, The HER program has a short measure life (1 year), while reaching the significant majority of residential customers. The period of time covered by the analysis is determined by the average measure life of the longest included program. Consequently, the model instance analyzing the HER program in isolation covers a much shorter period of time than the other two model instances, which means that the three instances are not directly comparable, and the first two model instances do not additively result in the third instance.

When the HER program is considered in isolation (Residential Model 1), average participants see a reduction in bills of on average 0.01%. When all other residential programs are considered together (Residential Model 2), the model shows average participants see a 5.29% reduction in average bills. Lastly, when all residential programs are considered together (Residential Model 3), the modeling shows the long-term average change in bills is very slightly positive (0.03%). As discussed in more detail in Section 4.3 of Attachment 7, this result is largely a byproduct of the modeling approach that combines the short-lived HER program with other longer-lived measures.

Table 17 and Table 18 summarize the results of the electric and natural gas rate and bill analyses for the 2021 proposed programs, respectively. All electric sectors except large C&I see a slight increase in long

term rates due to the 2021 programs, while all participating electric customers see a reduction in average long term bills due to their participation. Average electric customers also see a reduction in long term bills.

Table 17. Rate and Bill Impact Results for the Electric Portfolio

Sector	Average change in long term rates due to 2021 Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential	0.41%	0.41%	-0.42%	-0.42%
Income eligible	1.23%	1.23%	-2.46%	-2.54%
Small C&I	0.37%	0.37%	-0.81%	-8.88%
Medium C&I	0.03%	0.03%	-1.66%	-9.02%
Large C&I	-0.16%	-0.16%	-2.72%	-4.44%

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Section 4.3 of Attachment 7, this result is largely a byproduct of the modeling approach that combines the short-lived HER program with other longer-lived measures.

Table 18. Rate and Bill Impact Results for the Natural Gas Portfolio

Sector	Levelized net change in rates due to 2021 Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.4%	0.41%	0.15%	-5.29%
Residential (Model 3: All Programs)	0.4%	0.43%	0.15%	0.03%
Income eligible	0.7%	0.75%	-0.16%	-4.48%
Small C&I	0.3%	0.25%	0.19%	-7.12%
Large C&I	0.4%	0.41%	0.00%	-1.16%

8.2 Reliability

The programs developed under this Annual Plan will continue the Company's extensive history of offering best-in-class energy efficiency programs to customers, while introducing new implementation approaches and expanding the Company's existing programs to serve more customers. Existing programs that have significant experience and traction in the market will be extended and refined to deploy low-risk cost-effective energy efficiency to the marketplace. The Company continues to collaborate with a diverse set of stakeholders including the EERMC, OER, Division, and community and advocacy organizations to continually analyze the programs and identify opportunities for improvement.

In building this Annual Plan, the Company's Customer Energy Management team worked closely with industry experts, vendors, and program implementation professionals to assess the current state of existing programs, the potential for program scalability, the economic environment, and the ability to deliver reliable energy savings as a result. By speaking with on-the-ground implementers and engaging in discussions on regional and national best practices in the face of the COVID-19 pandemic, the Company positions the programs for success in what is a generally uncertain time.

Supporting the Company's efforts to deploy energy efficiency to Rhode Island customers is a robust and long-standing evaluation, measurement, and verification (EM&V) apparatus. As noted in Section 5, the Company hires independent third-party consulting firms to regularly conduct evaluation studies as part of its EM&V process. A distinct group of personnel within National Grid that includes analysts with specialized skills in engineering, statistics, and economics are tasked with the EM&V function and coordinate all elements of the EM&V process internally and externally. Evaluations incorporate industry standard methods to assess the actual energy and demand savings of measures incented by the

programs. All elements of the EM&V process are closely monitored by the EERMC, their Consultants, and OER. The EM&V process is continual, and every year results from EM&V studies are used to update the savings in the benefit cost calculation of the measure, programs, and portfolios. In addition, process evaluations and market studies conducted in the EM&V process provide an independent perspective on the performance of the programs and provide insight into the state of the market and ways that the Company can address new opportunities with its programs.

In total, these EM&V processes provide a transparent, externally vetted approach to ensuring that claimed savings provide an accurate picture as possible of the impact of the Company's energy efficiency programs, accounting for spillover, free ridership, and other industry standard adjustment factors

The EM&V process also supports the Company's participation in the ISO-NE Forward Capacity Market (FCM). Passive demand savings achieved via electric energy efficiency and Combined Heat and Power projects, and verified by the EM&V process, continue to participate in the FCM as Passive On-Peak Demand Resources. As detailed further in Section 11.1, the Company bids the passive demand savings attributed to energy efficiency measures and Combined Heat and Power facilities in the FCM and manages the associated capacity resources to maximize the resulting FCM revenue. The EM&V process provides the necessary verification of claimed savings in order to participate in the FCM.

Additionally, the Company anticipates that the 2021 Annual Plan will be the last year in which a residential efficiency lighting program will be offered. Due to the Company's successful efforts to transform the lighting market through its efficiency programs, the opportunities for cost-effective claimable lighting savings are anticipated to be exhausted by the end of 2021. In this time of transition, the Company will continually evaluate ways that other existing programs can be enhanced to generate savings that in the past were accomplished through relatively simple lighting measures. Increased complexity of measures will require new approaches to maintain the same levels of reliability of goals and savings in future plans.

8.3 Environmentally Responsible

The energy efficiency programs and portfolios described in the Annual Plan are environmentally responsible. They provide significant emissions reductions benefits, reduce the potential environmental costs and footprint of avoided infrastructure investments, support the ongoing growth and development of a sustainable, green job ecosystem in Rhode Island, and contribute to the realization of state environmental policy goals and initiatives.

8.3.1 Emissions Reductions

Both electric and natural gas efficiency portfolios will make a meaningful contribution to reduction in emissions by driving reductions in customer energy usage in both the short and long term. The electric and natural gas portfolios, considered together, will reduce lifetime emissions of 873,292 tons of Carbon Dioxide. The non-embedded values of CO_2 and NO_x benefits generated by the 2021 annual plan over the lifetime of the measures are $53,440,738 and $4,192,909, respectively.

8.3.2 Support for an Environmentally Responsible Local Jobs Infrastructure

In 2019, the Company's Energy Efficiency programs directly supported 877 FTEs. In providing for these jobs and demonstrating the availability and attractiveness of local, green jobs to Rhode Island's existing and emerging workforce, the Company's energy efficiency programs help to ensure that the local workforce will exist to support the state's environmental policy goals.

8.3.3 Raised Customer Awareness of Environmental Issues and the Impacts of their Choices

Educating and engaging residential and business customers on the potential environmental impacts and benefits of the implementation of energy efficiency measures is a foundational element of the Company's energy efficiency go-to-market strategy. Whether in the form of conveying potential environmental benefits of customer recommendations through Home Energy Reports, Energy*Wise* home energy assessments, or retail marketing initiatives, or by connecting SMB audits or large C&I customer sales efforts to business customer sustainability initiatives, the Company's energy efficiency program presence will continue to help to support the prominence of environmental issues in customers' minds. Additionally, through the Community-Based Initiative, the Company partners with municipalities and works through local energy and environmental sustainability committees to connect individual customers' energy efficiency decisions and actions to broader municipal sustainability goals and messages. In doing so, the Company's programs continue to link energy savings and efficiency to real and visible benefits for the communities in which their residents and small business reside.

8.4 Cost Effectiveness

The Company has analyzed the cost-effectiveness for the proposed 2021 portfolio and programs using the RI Test as required by Docket 4600[40] and the LCP Standards. The RI Test requires that the total lifetime savings from the efficiency measures exceed the total costs of the measures (i.e., program and customers' costs). In the revised LCP Standards, the PUC directed that portfolios and programs must be cost-effective. In the prior iteration of the LCP Standards, only portfolios were required to be cost-effective.[41]

The RI Test has been developed to incorporate benefit and cost. As provided for under the LCP Standards, benefits include primary fuel energy savings (electricity and natural gas), the value of other resource (fuel and water) benefits, price effects, non-embedded greenhouse gas reduction benefits, economic development benefits, non-embedded NO_x reduction benefits, the value of improved reliability, and non-energy impacts (NEIs). Costs include all projects costs, program planning and administration, sales, technical assistance and training, evaluation, and the performance incentive. To

[40] RI PUC Docket 4600, http://www.ripuc.ri.gov/eventsactions/docket/4600page.html
[41] Note that in past annual plans the Company had reported out on the cost effectiveness of its programs in addition to the portfolios.

illustrate the detailed components of the RI Test as well as the sources of the values, the Company has provided Attachment 4 RI Benefit Cost Test.

Attachment 5 Electric EE Program Tables, Table E-5 and Attachment 6 Gas EE Program Tables, Table G-5 provide the calculations of 2021 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 program goals from 2020. Attachment 5, Table E-5 shows that the proposed portfolio of electric programs, including active demand response, is expected to have a benefit/cost ratio of 4.31, which means that approximately $4.41 in benefits is expected to be created for each $1 spent on the portfolio. Attachment 6, Table G-5 shows that the proposed portfolio of gas programs is expected to have a benefit/cost ratio of 3.00, which means that $3.00 in benefits is expected to be created for each $1 spent on the portfolio. This increase in efficiency investment continues the progress of acquiring all energy efficiency resources that are cost-effective and lower cost than supply.

Table 19. Electric Benefit Cost Ratios at Program and Portfolio Level

Electric Benefit Cost Ratios	
Large Commercial & Industrial Programs	
Commercial New Construction	6.24
Commercial Retrofit	7.52
Small Business Direct Install	3.35
Commercial ConnectedSolutions	9.85
Commerical and Industrial Subtotal	6.05
Income Eligible Programs	
Income Eligible Single Family	2.65
Income Eligible MultiFamily	1.76
Income Eligible Subtotal	2.27
Residential Programs	
Residential New Construction	2.69
EnergyStar® HVAC	2.77
EnergyWise	1.89
MultiFamily	2.44
Home Energy Reports	3.23

EnergyStar® Lighting	3.29
Residential Consumer Products	2.84
Residential ConnectedSolutions	6.13
Non-Income Eligible Residential Subtotal	**2.44**
Portfolio	**4.31**

Table 20. Natural Gas Benefit Cost Ratios at Program and Portfolio Level

Natural Gas Benefit Cost Ratios	
Large Commercial & Industrial Programs	
Large Commercial New Construction	4.86
Large Commercial Retrofit	5.27
Small Business Direct Install	3.83
Commercial & Industrial Multifamily	4.75
Commercial & Industrial Subtotal	**4.69**
Income Eligible Programs	
Single Family - Income Eligible Services	2.94
Income Eligible Multifamily	4.21
Income Eligible Residential Subtotal	3.20
Residential Programs	
Energy Star® HVAC	1.66
EnergyWise	2.01
Multifamily	4.70
Home Energy Reports	4.05
Residential New Construction	1.02
Non-Income Eligible Residential Subtotal	**2.01**
Portfolio	**3.00**

8.5 Cost of Annual Plan Compared to the Cost of Energy Supply

In accordance with the LCP Standards, the Company assessed the cost of energy supply and the cost of energy efficiency using all applicable costs enumerated in the Rhode Island Benefit Cost Framework (Framework) approved by the PUC in Docket 4600-A and the Rhode Island Test as described in Attachment 4 RI Benefit Cost Test. This method is substantially the same as that used in the 2020 Plan.

Based on the Company's calculation, the total cost of energy efficiency for the electric portfolio is $140.7 million and the total cost of electric supply is $262.0 million. This is a total savings of $121.2 million over the life of the installed energy efficiency measures from investing in energy efficiency instead of electric supply. The total cost of energy efficiency for the natural gas portfolio is $48.3 million and the total cost of natural gas supply is $62.5 million. This is a total savings of $14.2 million over the life of the installed energy efficiency measures from investing in energy efficiency instead of natural gas supply. The methodology for calculating Cost of Supply is detailed below.

The RI Test is an appropriate mechanism to determine which costs to include in this assessment. The RI Test, as detailed in Attachment 4, captures the aspects of the Framework that pertain to energy efficiency programs. The source for many of these values is the "Avoided Energy Supply Components in New England: 2018 Report" prepared by Synapse Energy Economics for the AESC 2018 Study Group, October 31, 2018. The benefits in the RI Test are associated with the cost savings to Rhode Island from investing in energy efficiency instead of investing in additional energy supply. For the purpose of the RI Test, these values are described as a benefit of energy efficiency in the form of avoided costs. The avoided cost values can also be applied as the costs of procuring additional energy supply for the purpose of this assessment. The RI Test also details what is considered a cost of energy efficiency. These are costs incurred by the utility to implement the Plan and the expense borne by the customer for its share of the energy efficiency measure cost.

The Company proposes to use the costs described in Table 21 to compare the cost of energy efficiency to the cost of energy supply. The categories listed in this table are all used in the RI Test, as proposed in Attachment 4 of the Plan. As directed by the LCP Standards, the Company provides an explanation for why cost categories are either appropriate or not appropriate for inclusion in the assessment of the cost of energy supply compared to the cost of energy efficiency.

Table 21. List of the Costs of Energy Efficiency and Costs of Energy Supply

Costs of Energy Efficiency		
Cost	**Included (Y/N)**	**Explanation**
Utility Costs	Yes	These costs are incurred to achieve implementation of energy efficiency measures and programs. Includes all costs in Tables E-2 and G-2.
Participant Costs	Yes	Customer contribution to the installation cost of the efficient measure. Customer costs included in Tables E-5 and G-5.

Costs of Energy Supply		
Cost	**Included (Y/N)**	**Explanation**
Electric Energy Costs	Yes	Represents the cost of purchasing electric energy supply.
Electric Generation Costs	Yes	Represents cost of generation capacity in ISO-NE.
Electric Transmission Capacity Costs	Yes	Represents Pool Transmission Facilities (PTF) cost.
Electric Distribution Capacity Costs	Yes	Represents the cost of distribution capacity related to increased load.
Natural Gas Costs	Yes	Represents the cost of purchasing natural gas supply.
Fuel Costs	Yes	Non-regulated delivered fuels are an energy supply cost to customers that utilize these fuels for heating. The fuel costs in this category are separate from those embedded in the cost of the electric market. While not a direct cost of electric energy supply, National Grid includes incentives for delivered fuel energy efficiency measures in its electric portfolio. Therefore, to achieve symmetry with costs associated with electric energy efficiency, delivered fuels costs should be included in this comparison.
Water and Sewer Costs	No	While avoided water and sewer costs are a benefit of installing certain energy efficiency measures, they are not a direct cost of energy supply.
Non-Energy Impact Costs	No*	*Unless listed below. While non-energy impacts are a benefit of installing certain energy efficiency measures, they are not a direct cost of energy supply.
Income Eligible Rate Discount	Yes	Costs associated with energy being sold at the income eligible rate.

Arrearages	Yes	Costs associated with arrearage carrying costs as a result of customers not being able to pay their energy bills.
Price Effects	Yes	Represents costs associated with the impact of demand reduction on ISO-NE energy and capacity markets.
Non-embedded Greenhouse Gas Reduction Costs	Yes	Represents the social cost of carbon. The social cost of carbon is the cost associated with meeting the goals of the Resilient Rhode Island Act. Carbon emissions come from the production of energy and should be considered a cost of supplying that energy.
Economic Development	No	While economic development is a benefit of investment in energy efficiency measures it is not a direct cost of energy supply.
Non-embedded Nitrous Oxide (NOx) Costs	Yes	NOx emissions come from the production of energy and therefore the health impacts of NOx emissions should be considered part of the cost of supplying that energy.
Reliability Costs	Yes	Increased energy demand can lead to declining reserve margins and decrease reliability so should be associated with the cost of energy.

For the assessment, the Company applies the above costs of supply to the lifetime energy, lifetime MMBtu of delivered fuels, demand, and natural gas savings for each measure included in the Plan in present value terms. The costs of the 2021 Plan occur only in 2021 and are therefore not discounted.

FUNDING PLAN, BUDGET AND GOALS

9. Savings Goals

In 2021, the Company will primarily measure performance based on lifetime energy savings. This is a change from prior years where the primary units of performance measurement were in annual units. The electric portfolio will measure energy savings in units of lifetime MWh and the gas portfolio will measure energy savings in units of lifetime MMBtu. For comparability with past plans, the Company will continue to track and report on annual energy savings as has been done for the duration of the programs. Electric demand savings, from passive energy efficiency savings and active demand response, will continue to be measured and reported in annual units of kW. The Company recognizes the long-term value of developing and achieving lifetime energy savings goals because of the focus on longer term customer savings and benefits. The change to lifetime energy savings goals aligns with the energy savings Targets as set by the EERMC, and approved by the PUC, in Docket 5023.[42]

9.1 Electric Portfolio Savings Goals

Continuing from 2020, the Company will also track net annual and lifetime all-fuel MMBtu (electric, gas, oil, and propane) savings as a test metric for the electric portfolio. The electric energy efficiency program tables included in Attachment 5 reflect this additional metric, and further detail on Test Metrics is included in Section 13.

Tracking net annual and lifetime all-fuel savings (MMBtu) more fully captures the net effect of all-fuel savings efforts (electric, oil, and propane). The tracking effort will provide useful information and benchmarking for state efforts to support decarbonization of the thermal energy sector and better support State and Company greenhouse gas reduction goals now and in the future.

To first convert electric energy savings from MWh to MMBtu, the Company proposes to multiply MWh by an industry standard conversion factor of 3.412 MMBtu per MWh.[43] This conversion applies only to electric energy savings. Savings from natural gas and delivered fuel are tracked in MMBtu. In this Plan, the electric savings converted to MMBtu are shown in Table E-6A in Attachment 5 Electric EE Program Tables. Equation 1 shows the calculation of electric MWh savings to MMBtu.

Equation 1. Conversion of MWh to MMBtu Calculation

$$MMBtu_{Electric} = MWh_{Electric} \times 3.412\ MMBtu/MWh$$

[42] RI PUC Docket 5023, http://www.ripuc.ri.gov/eventsactions/docket/5023page.html
[43] The conversion factor of 3.412 MMBtu/MWh is a constant value. Energy Information Agency, EIA: https://www.eia.gov/totalenergy/data/monthly/pdf/sec13_7.pdf

To calculate net all-fuel MMBtu as reported in Table E-6A in Attachment 5, the Company will sum electric savings (converted to MMBtu), natural gas savings, and delivered fuel (oil and propane) savings. This summation captures savings impacts for all fuels attributable to an electric measure.

Equation 2. Calculation of Net All-Fuel MMBtu Calculation for Electric Savings Measures

$$MMBtu_{All\ Fuel} = MMBtu_{Electric} + MMBtu_{Natural\ Gas} + MMBtu_{Delivered\ Fuels}$$

9.2 Natural Gas Portfolio Savings Goals

For the natural gas portfolio, the Company proposes to primarily measure energy savings in units of net lifetime MMBtu, while continuing to track net annual MMBtu for comparability with past plans.

10. Annual Plan Compared to the Three-Year Plan

In the LCP Standards approved in Docket 5015,[44] the PUC afforded the Company the opportunity to combine the 2021 Annual and 2021-2023 Three-Year Plan filings if notification was made to the EERMC by July 1, 2020. The Company chose to exercise that option and for the first time will combine the filing of the annual and three-year energy efficiency plans. This 2021 Annual Plan is filed concurrently with the 2021-2023 Three-Year Plan.

Consequently, the savings goals and budgets put forward in the first year of the 2021-2023 Three-Year Plan will match the values in this 2021 Annual Plan, as the supporting planning processes were conducted concurrently. The Company expects that in the 2022 and 2023 Annual Plans there will be differences between the Three-Year Plan filed in 2020 and each subsequent Annual Plan. In those years, causes of differences between the plans will be documented and reported in this section of each plan.

11. Funding Plan and Budgets

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

In developing the savings goals, associated budgets, and funding plans for this 2021 Annual Plan, the Company took into account the traditional factors (anticipated 2020 year-end fund balances and anticipated 2021 sales volumes) that always impact the relationship between requested implementation budgets and the required customer surcharges necessary to fund the proposed plan. In addition, the Company recognizes the COVID-19 related uncertainties facing the Rhode Island economy and has

[44] RI PUC Docket 5015, Least Cost Procurement Standards http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf

committed to maintaining flat energy efficiency surcharges in the proposed 2021 Annual Plan compared to the approved 2020 Annual Plan energy efficiency surcharges.

2020 Year-End Fund Balances

- Given the fixed nature of the 2020 electric and gas energy efficiency surcharges, year-end fund balances will be a function of both remaining Company collections results as well as volumetric sales through year-end. Consistent with recent practice, a final update to the projected year-end fund balance to be provided to the Commission on December 1st, 2020.
- The 2020 year-end fund balance will also be a function of actual implementation expenses and Company earned performance incentive through year-end 2020. For the October 15th submission to the PUC, the Company has included 2020 year end fund balance forecasts (electric and gas) on line 2 of the E-1 and G-1 tables in Attachment 5 and Attachment 6, respectively. The fund balance forecasts include estimated implementation expenses and estimated earned performance incentives. Consistent with recent practice, on December 1, 2020 the Company will provide updated year-end fund balance forecasts, reflecting updated sales, collection, and program expenditure forecasts through year-end. Typically, these forecasts are used to adjust EE surcharges for the following year, with a goal of forecasting a zero fund balance at the end of the following year. For purposes of this year's December 1 updated fund balance forecasts submission, in the event that either of the year end fund balance forecasts increase, this will result in a lowering of the corresponding proposed 2021 energy efficiency surcharges. In the event that the year end fund balance forecasts decrease, the Company will propose 2021 surcharges that are the same as those included in the October 15, 2020 EE Annual Plan filing in order to honor the commitment to maintain flat surcharges between 2020 and 2021. If the actual year-end 2020 fund balance as filed in the Year-End Report on May 1, 2021 is higher or lower than that amount projected in the December 1, 2020 revised Tables E-1 and G-1, any deviation will be fully reconciled in the next program year in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7.

Anticipated 2021 Sales

- The proposed 2021 surcharges are a function of both energy efficiency plan funding requirements as well as forecasted volumetric sales in 2021. As in past years, this filing incorporates the most current electric and gas forecasts as of the creation and distribution of this report. Annual Plan Funding Sources

The sources of funding and the amounts of the funding proposed for the cost-effective 2021 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 2021 electric programs are shown in Attachment 5 Electric EE Program Tables, Table E-1. To collect these funding sources for the 2021 cost-effective programs, the Company proposes: (1) one line on the customers' bill labeled "Energy Efficiency Charge" at $0.01323 per kWh, as calculated in Attachment 5, Table E-1 (composed of the existing energy efficiency program charge of

$0.1323 per kWh plus a fully reconciling funding mechanism charge of $0.00000 per kWh in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7); (2) projected Large C&I commitments from 2021, if any; (3) projected carryover of the year-end 2020 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) other potential outside revenue sources, including but not limited to those generated through RGGI permit auctions. Funding sources do not include revolving loan funds.

Navy CHP Settlement Agreement Funding Source

Pursuant to the PUC Open Meeting on September 1, 2020 in relation to Docket No. 4755 Navy CHP Settlement Agreement, the Company has taken the following step:

1. Included a credit in the electric energy efficiency fund in the amount of$469,641.16. This includes:

    a. $226,880 that represents a refund to customers of the costs incurred by the Company in connection with the 7 MW Combined Heat and Power (CHP) system for installation at Naval Station Newport and the Company's time spent in connection with seeking approval in Docket No. 4755 relating to the Notification[45] during calendar years 2016, 2017, 2018, and 2019, that were charged to the Electric EE Fund.
    b. $226,880 that is a Company shareholder-funded matching contribution to the Electric EE Fund.
    c. $15,881.16 in estimated interest for the 4-year period.

The above amount of $469,641.16 was added to the Electric EE Fund and is included on line 3 of table E-1, "Electric DSM Funding Source in 2021 by Sector $(000)" in Attachment 5 of the 2021 Annual Plan.

The sources of funding for the 2021 natural gas programs are shown in Attachment 6 Gas EE Program Tables, Table G-1. The Company proposes that the 2021 budget should be funded from the following sources: (1) one line on the customers' bill labeled "Energy Efficiency Charge" at $1.011 per dekatherm for residential customers and $0.704 per dekatherm for non-residential customers as calculated in Attachment 6, Table G-1 (composed of the existing energy efficiency program charge of $1.011 per dekatherm plus a fully reconciling funding mechanism of $0.000 per dekatherm for residential customers and the existing energy efficiency program charge of $0.704 per dekatherm plus a fully reconciling funding mechanism of $0.000 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 2020 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.

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[45] On May 31, 2018, the Company filed a Notification of an Energy Efficiency Incentive Greater Than $3,000,000 (the Notification) related to the $7,242,000 incentive for a 7 MW Combined Heat and Power (CHP) system for installation at Naval Station Newport, in Newport, Rhode Island.

The 2021 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 electricity and natural gas sales, year-end 2020 large C&I program commitments, capacity payments received from ISO-NE (electric only), and year-end 2020 spending. The Company estimates that the electric projected fund balance at year-end 2020 will be positive $19.96 million, as shown in Line 3, Attachment 5, Table E-1; the gas fund balance at year-end 2020 is estimated to be positive $5.82 million, as shown in Line 2 Attachment 6, Table G-1.

It is likely that the actual year-end 2020 fund balance will be higher or lower than the dollar amounts projected in this Plan. To ensure that the 2021 Energy Efficiency Charge reflects the most current fund balance projections possible, the Company proposes to submit revised Tables E-1 and G-1 on December 1, 2020 to include several additional months of actual expenses and revenues in the calculation of the Charge. The Company proposes to submit revised tables on December 1, 2020 and not at the end of the year to provide the PUC with time to review the Company's proposed charges in advance of the Annual Plan hearing. This would allow the charges, if approved, to have an effective date of January 1, 2021. This will allow the Company to begin collecting the most accurate charge possible at the start of the program year and avoid any market confusion surrounding the status and implementation of the 2021 energy efficiency programs. If the actual year-end 2020 fund balance as filed in the Year-End Report on May 1, 2021 is higher or lower than that amount projected in the December1, 2020 revised Tables E-1 and G-1, any deviation will be fully reconciled in the next program year in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7.

Other considerations regarding funding sources are described in the subsequent sections.

11.1 ISO-NE Capacity Market Revenue

Consistent with the LCP Standards, Annual Plan, and PUC decisions regarding annual plans since 2008, the Company and the Parties agree 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 Company will manage and direct the revenues by bidding the demand savings attributed to energy efficiency measures and Combined Heat and Power facilities in the FCM and managing the associated capacity resources to maximize the resulting FCM revenue. The revenues from measures installed through this Plan, as well as all previous Plans, will continue to be reinvested in energy savings for the life of the measure.

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 Evaluation, Measurement and Verification (EM&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,[46] 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.

11.2 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 natural gas energy efficiency surcharge.[47]

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 natural gas energy efficiency program services.

11.3 Budgets

The Parties agree that the portfolio of energy efficiency programs and services for 2021 will have an overall budget of approximately $122.3 million for electric programs and $38.6 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. Proposed sector and program budgets are provided in Attachment 5 Electric EE Program Tables, Table E-2 and Attachment 6 Gas EE Program Tables, 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 2019 budget is provided in Attachment 5, Table E-4 and Attachment 6, Table G-4.

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[46] Such circumstances may include legislative action to alter the EE Program 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.

[47] 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.

The Parties agree to review the status of budgets regularly to assess whether they are likely to be fully utilized. If not being utilized, 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 11.4 below.

The Company will continue the practice of funding commitments established in the 2014 Plan, Docket 4451. Specifically, the Company will continue to make funding commitments for projects with a projected incentive in excess of $3 million. For all other projects, except those with incentives greater than $3 million, there would be no commitment budget.

11.4 Transferring 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 discussed above) and will transfer monies as needed. Transfers during the program year may occur as follows:

- Transfers within a Sector. For transfers of less than 20% of the originating program's budget, the Company can transfer funds from one program to another program or pilot in the same sector. For transfers of 20% or more of the originating program or pilot's budget, the Company can transfer funds from one program to another program in the same sector with the Division's prior approval. Upon seeking the Division's approval, the Company shall simultaneously notify the EERMC and OER. For all transfers in a sector, the Company will reflect changes in the quarterly report(s) following the transfer and the year-end report.

- Transfers between Sectors. The Company can transfer funds from one sector to another sector with the Division's prior approval. Upon seeking the Division's approval, the Company shall simultaneously notify the EERMC and OER. 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.

- Transfers among residential retrofit programs. The Company can transfer among Energy*Wise*, 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.

- 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.

- 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 performance incentive calculation. Any changes will be communicated and reported consistent with transfers between sectors, described above.

11.5 Budget Management

Deviations from the planned budget for 2021 are possible during the program year. The Parties contemplate three scenarios, and have agreed to address them as follows:

- The Company's expenditures for 2021 may exceed the total budget by up to 10% so long as written notification is provided to the EERMC, OER, PUC, and DPUC for any deviation. The Company will track expected expenditures relative to planned budgets and will report to stakeholders through inclusion in the quarterly reports, or earlier, if the Company believes such overage is likely to occur. Any such notification will occur as soon as possible, and no later than the distribution of the Company's Third Quarter Report in mid-November 2021 and must explain the need for a higher budget and must justify how the expenditures are reasonably consistent with the original annual plan and in accordance with Least Cost Procurement.

- The Company agrees that, during 2021, if the Company anticipates that continued operation of its programs is likely to result in actual expenditures exceeding the total budget by more than 10%, the Company will seek a vote of approval from the EERMC. OER commits to making all reasonable efforts to schedule such vote as soon as feasible following notification, but no later than thirty days from receipt of notification. Following EERMC action, the Company will be required to obtain approval from the PUC for expenditures in excess of 15% higher than the total budget, which would be collected through reconciliation in the next year's energy efficiency program charge.

- During a program year, if the Company did not anticipate and notify parties identified above that its actual expenditures would exceed the total budget by more than 10%, but actual expenditures do exceed such threshold, such expenditures above 110% of approved budget will be at the Company's risk, and in order to secure cost recovery, the Company will bear the burden of demonstrating the reasonableness of its actions to the PUC, including an explanation of why the over-spending occurred and how the expenditures are reasonably consistent with the original plan and in accordance with Least Cost Procurement. Such demonstration would be required to be part of the 2021 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.

11.6 Notification of large customer incentives

The Company shall inform the PUC, DPUC, OER, and EERMC in writing of any energy efficiency incentive annual offer in excess of $3 million per a measure. The Company shall inform the DPUC, OER, and EERMC in writing of any CHP project with a net output of 1 MW or greater (where net is the nameplate MW output minus CHP auxiliary kW). The process for notification of CHP projects is described in Attachment 2 C&I Programs.

To prevent customer delays and to facilitate the Company's ability to meet customer expectation and annual energy savings goals, the OER, EERMC and Division agree to ask questions and provide comments on any non-CHP energy efficiency incentive annual offer in excess of $3 million within thirty days. The Company, through its own discretion, may proceed with an incentive offer. The incentive, and any other related proposals will be authorized to proceed after thirty days from the date on which the Company notified the PUC, OER, Division, and EERMC of the incentive 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.

12. Performance Incentive Plan

12.1 Background

Pursuant to R.I. Gen. Laws § 39-1-27.7(e) and § 39-1-27.7.1 and the revised LCP Standards as approved in Docket 5015, the Company has an opportunity to earn a shareholder incentive (also called performance incentive) that is dependent on its performance in implementing Least-Cost Procurement. The revised LCP Standards indicate that the structure of a performance incentive will only be proposed in the Three-Year Energy Efficiency Plan.

12.2 Performance Incentive Structure

The structure of the proposed performance incentive mechanism is detailed in the Company's 2021-23 Three-Year Energy Efficiency and Conservation Procurement Plan. The proposed specific application of that mechanism to the 2021 Annual Plan is outlined below.

12.2.1 Total Performance Incentive Pool

The Company's design level incentive pool (i.e. the performance incentive that the Company will earn for delivering 100% of planned net benefits) will be established at $7.2 million. $5.5 million of this pool will be allocated to the electric portfolio, and $1.7 million to the gas portfolio.

12.2.2 Sector Allocations

The respective electric and gas performance incentive pools will be allocated among sectors on the basis of the following percentages:

Table 22. Allocations of Performance Incentive Earning Opportunity

Sector	Electric Portfolio Allocation of Overall Performance Incentive Pool by Sector in 2021	Gas Portfolio Allocation of Overall Performance Incentive Pool by Sector in 2021
Residential	35%	35%
Income Eligible	20%	25%
Commercial and Industrial	45%	40%
Equity metric	0%	0%

These allocations have been set on the basis of stakeholder negotiations, and are intended to roughly align with share of implementation budget levels assigned to each sector, adjusted to reflect areas of stakeholder desired emphasis in Company program delivery.

As noted in the Three-Year Plan, while incentive pool allocations to the equity metric are anticipated in the 2022 and 2023 Annual Plans, the Company has not proposed any allocation for 2021 while necessary data tracking processes and baseline data continue to be developed through the remainder of 2020 and 2021.

12.2.3 Sector Thresholds and Caps

Given the unusual degree of delivery risk associated with the COVID-19 pandemic and resulting economic uncertainty, the lower bound of the Company's earning threshold within each sector will begin at 65% achievement of planned net benefits (as opposed to the standard 75% defined within the Three Year Plan).

Company sector level earnings will remain capped at 125% of design level earnings at Company achievement of 125% or greater planned net benefits within each sector.

12.2.4 Performance Incentive Earning Rates

Performance incentive earnings rates are to be set on the basis of sector specific planned net benefits (e.g. macroeconomic benefits) and the absolute dollar value of the share of the incentive pool allocated to each sector.

Table 23. PI Earning Rates by Sector – Electric Portfolio

Sector	Planned Net Benefits (ex-Macroeconomic Multiplier)	Design level Incentive Pool Allocation	Performance Incentive Payout Rate
Residential	$53,889,918	$1,925,000	11.132%
Income Eligible	$27,422,570	$1,100,000	12.617%
Commercial and Industrial	$197,427,750	$2,475,000	1.735%

Table 24. PI Earning Rates by Sector – Gas Portfolio

Sector	Planned Net Benefits (ex-Macroeconomic Multiplier)	Design level Incentive Pool Allocation	Performance Incentive Payout Rate
Residential	$14,459,738	$425,000	2.939%
Income Eligible	$11,763,446	$595,000	5.058%
Commercial and Industrial	$35,393,410	$765,000	2.161%

Specific performance incentive earnings within each sector will be determined on the basis of multiplying achieved net benefits (ex the macroeconomic multiplier) within each sector by the portfolio and sector specific payout rate for that sector, subject to the earnings threshold and cap rules outlined above in Section 12.2.3.

13. Future Performance Metrics

13.1 Testing Performance Metrics

In 2021, the Company proposes to continue tracking and reporting performance related to certain metrics in order to test progress towards several key objectives. In 2019, the Company began testing and reporting annual and lifetime carbon reductions resulting from investments in the electrification of heating and delivered fuels measures, lifetime MWh and MMBtu savings, program costs per energy savings, and a customer satisfaction metric. The Company proposes to continue tracking these metrics and work towards tracking greenhouse gas equivalent savings (in carbon dioxide equivalents) resulting from all electric and natural gas measures. These efforts were originally intended to inform consideration of new performance metrics for future annual plans that better align with Rhode Island's goals for Power Sector Transformation and greenhouse gas emissions reductions. In this Annual Plan, the Company anticipates proposing a new performance incentive mechanism that does not directly rely on these metrics, but will accomplish many of the same goals of the metrics as originally envisioned.

For any new performance incentive, the Company will work with the Division, OER, EERMC Consultants, and the EE TWG in the development of future baselines and financial rewards for any new annual goals resulting from these test metrics.

13.1.1 Carbon and Carbon Dioxide Equivalent (CO2e) Reductions

The Company proposes to continue tracking annual and lifetime carbon reductions resulting from investments in energy efficiency measures that save delivered fuels. While the Company does not currently include electrification of delivered fuel heating in its programs, this approach mirrors what was proposed in the Company's Power Sector Transformation Vision and Implementation Plan, as detailed in the Docket Nos. 4770/4780 Settlement Agreement. Carbon reductions will be calculated using emission rates from the 2018 AESC Study shown in Table 25 below, multiplied by the resulting annual and lifetime avoided oil or propane from measures that save these delivered fuels. In addition, the Company will use emissions rates from the 2018 AESC Study to quantify natural gas and electricity carbon emissions.

Table 25. 2018 AESC Study Emission Rates

Fuel	Emissions Rate	Unit
#2 Fuel Oil	0.081	CO2 (tons/MMBtu)
Propane	0.070	CO2 (tons/MMBtu)
Natural Gas	0.059	CO2 (tons/MMBtu)
Electricity	0.470	CO2 (tons/MWh)

The carbon metric will provide additional visibility into this suite of measures that do not significantly contribute to existing electric and demand savings goals but contribute to Rhode Island's greenhouse gas reduction goals.[48] The Company notes that the non-embedded value of carbon and nitrogen oxides is included as a calculated benefit in the RI Test.

In 2021, the Company proposes to continue testing a performance metric for carbon. The Company believes it is prudent to track this metric to help inform the development of an annual goal and potentially an appropriate performance incentive level in the future.

In addition to tracking carbon reductions for the purpose of this metric, the Company will develop a methodology for tracking and reporting CO2 equivalents (CO2e) during Q1 and Q2 of 2021, and test the incorporation of this tracking during program year 2021 for full incorporation and reporting out during program year 2022. The Company will coordinate with stakeholders including OER as methodologies are assessed and will determine an appropriate and transparent approach. While further research is needed, a possible approach is to calculate avoided emissions from energy efficiency based on marginal emission rates from ISO-NE for SOx, NOx, and CO2, as reported in annual ISO New England Electric

[48] Rhode Island Greenhouse Gas Emissions Reduction Plan, December 2016.

Generator Air Emissions Reports.[49] Total avoided emissions from each of these categories could then be converted to common CO2e units using a greenhouse gas equivalency calculator such as that available from US EPA.[50]

13.1.2 Lifetime and Annual All-Fuels MMBtu Savings

Beginning in this 2021 Annual Energy Efficiency Plan, the Company set its primary energy savings goals in lifetime units. The Energy Efficiency Targets as filed and approved in Docket 5023 were denominated in lifetime units, therefore the Company set its goals in the same units. Lifetime savings are calculated for each efficiency measure as the product of annual savings multiplied by the effective useful life of the measure. National Grid has reported lifetime energy savings units for several years and will continue to track annual energy savings alongside lifetime units. As in the 2020 Annual Plan, the Company will track and report all-fuels annual and lifetime MMBtu savings in 2021. For the electric savings measures, all-fuels MMBtu savings can contain savings from electricity, oil, or propane depending on the measure.

13.1.3 Program Costs Per Energy Savings

The Company currently includes the projected costs of lifetime electric and gas savings in its annual plans. In 2019, the Company began including the actual costs of lifetime savings compared to planned values in its quarterly reports. In 2021, the Company will continue this reporting in its quarterly reports and will continue to include this metric in its Year-End Report.

The Company will also continue to report on the cost of saved peak demand for the residential and C&I active demand response programs. This metric will be important to track as active demand response offerings mature and scale.

13.1.4 Customer Satisfaction

The Company proposes to continue to track a Customer Satisfaction metric in 2021. The metric will continue to apply to whole house programs such as Energy*Wise* Single Family and Income Eligible Single Family, with the potential to expand to other residential programs over time.

The Company proposes to utilize a third-party vendor to conduct the customer survey. The metric would be based on customer responses to the following questions:

- How likely are you to recommend this program to a friend or colleague? (0-10 point scale)
- How can we improve your experience? (Open ended question)

The Company will track customer responses and report out on the average satisfaction across tracked programs. The Company will detail progress on the above proposed metrics in its quarterly reports as

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[49] See, for example, the 2018 ISO New England Electric Generator Air Emissions Report, Table 1-2: https://www.iso-ne.com/static-assets/documents/2020/05/2018_air_emissions_report.pdf
[50] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

well as a detailed summary of the results, lessons learned, and any needed improvements in its 2021 Year-End Report to the PUC.

13.1.5 Peak Hour Gas Demand Savings

In 2020, the Company began tracking an estimate of peak-hour gas demand savings based on existing heuristics that assume fixed, but distinct, relationships between annual and peak day and peak hour gas consumption for heating and non-heating based customer usage of natural gas. The Company will be clear in all reporting that National Grid considers this to be a rough approximation of peak-hour gas demand impacts. During 2020 and continuing in 2021, the Company has committed to working towards quantifying peak gas demand savings resulting from gas energy efficiency measures for application in future years and for potential inclusion in future performance incentive mechanisms. In order to quantify these savings, the Company joined an existing residential study in Massachusetts in 2020 and expanded the study scope to Rhode Island homes in order to measure peak gas demand savings resulting from residential sector energy efficiency measures. More information is included in Attachment 3 EM&V Plan. Further, the Company is initiating a commercial and industrial study of peak gas demand in 2020 to continue into 2021.

13.2 Forward Looking Performance Metrics

13.2.1 Renter and Rental Unit Tracking

The Company proposed a new performance incentive mechanism in the 2021-2023 Three-Year Energy Efficiency Plan and in this 2021 Annual Plan, as discussed in Section 12. The Company commits to revisiting this performance incentive structure in 2022 and beyond and negotiating in good faith with stakeholders around the allocation of a portion of the Company's performance incentive opportunity to achievement of specific equity related performance objectives. Consistent with the belief that measures of program participation by renters or rental units may be included in this mechanism, The Company is currently undertaking an analysis of the data it possesses on participants that are renters, along with rental units, and looks to expand the collection of this information across more programs, where appropriate. The Company has committed to tracking renters that participate in energy efficiency programs beginning in 2020 and will ensure the data is of sufficient breadth and quality to serve as the basis for linking a portion of the Company's performance incentive metric to program participation by rental units, should the Company and stakeholders agree to inclusion of this metric in future performance incentive mechanisms.

14. Advancing Docket 4600 Principles and Goals

Along with the quantitative benefits detailed in the Plan, as measured by the RI Test, the energy efficiency investments and innovation planned for 2021 also advance the Docket 4600 principles and goals.[51]

The Docket 4600-A Guidance Document directed that "the proposing party must provide accompanying evidence that addresses how the proposal advances, detracts from, or is neutral to each of the stated goals of the electric system."[52]

To meet this directive, the Company describes how the Plan either advances, detracts, or remains neutral on achieving the Docket 4600 goals for the electric system in Table 26.

Table 26. Docket 4600 Goals for the Electric System

4600 Goals for Electric System	Advances/Detracts/Neutral
Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the long term.	Advances: The Plan gives customers tools to reduce their energy consumption. The safest, most reliable, most affordable energy is energy that is never used. Lowering energy consumption avoids investments in the installation, upgrade, or replacement of transmission and distribution infrastructure, and reduces strain on the system.
Strengthen the Rhode Island economy, support economic competitiveness, retain and create jobs by optimizing the benefits of a modern grid and attaining appropriate rate design structures.	Advances: The Plan will create significant economic benefits in Rhode Island. The Company expects that investments made in energy efficiency under this Plan will add $341.8 million to Rhode Island's Gross State Product (GSP).
Address the challenge of climate change and other forms of pollution.	Advances: The Plan will avoid 873,292 tons of carbon over the lifetime of the installed measures as well as reduce other pollutants associated with the generation and

[51] PUC Report and Order No. 22851 accepting the Stakeholder Report. Written Order issued July 31, 2017.
[52] Approved final clean version of Guidance Document 10/27/17.

	combustion of electricity, natural gas, and delivered fuels.
Prioritize and facilitate increasing customer investment in their facilities (efficiency, distributed generation, storage, responsive demand, and the electrification of vehicles and heating) where that investment provides recognizable net benefits.	Advances: The Plan provides incentives for customers to invest in cost-effective energy efficiency measures in their facilities and participate in demand response programs.
Appropriately compensate distributed energy resources for the value they provide to the electricity system, customers, and society.	Neutral
Appropriately charge customers for the cost they impose on the grid.	Neutral
Appropriately compensate the distribution utility for the services it provides.	Advances: The performance incentive contained in this Plan compensates the Company for achieving the energy savings goals through delivering cost-effective energy efficiency programs to customers while aligning with the PUC's PIM principles.
Align distribution utility, customer, and policy objectives and interests through the regulatory framework, including rate design, cost recovery, and incentive.	Advances: The Plan aligns Company, customer, and policy objectives and interests by incentivizing energy savings measures that enable customers to manage and reduce their energy consumption, which in turn contributes to the greenhouse gas reduction goals of the Resilient Rhode Island Act of 2014, Power Sector Transformation goals, Heating Sector Transformation goals, and the 100% Renewable Electricity goal while allowing the Company to earn a performance incentive.

CONCLUSION

15. Miscellaneous Provisions

- Other than as expressly stated herein, this Plan 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.
- Other than as expressly stated herein, the approval of this Plan by the PUC shall not in any way constitute a determination as to the merits of any issue in any other PUC proceeding.
- The Parties agree that National Grid shall convene the Energy Efficiency Technical Working Group no less than six times in 2021 to review the status and performance of the Company's 2021 energy efficiency programs and advise the Company on potential energy efficiency programs for 2022.

16. Reporting Requirements

- In 2021, the Company will provide quarterly reports to the EERMC, the Division, OER, the EE TWG, 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 revolving loan funds. The Company will also coordinate reporting of loan funds with the Rhode Island Infrastructure Bank. The reports will also include a brief summary of program progress and will highlight issues by sector for EERMC, Division, OER, and Technical Working Group 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.
- In the 2019 Year End Report, the Company provided detailed costs schedules that were developed in collaboration with the Rhode Island Division of Public Utilities and Carriers. The Company proposes to submit detailed cost schedules in the 2021 Year End Report. In addition, the Company also proposes to submit confidential vendor schedules to the PUC, with a motion for protective treatment. These confidential vendor schedules detail costs to individual vendors and other external entities.
- In 2021 for months during which quarterly reports are not produced, the Company will provide to the EERMC, the Division, and the EE TWG monthly summaries of year-to-date spending and savings and results by sector.
- The Company will provide to the Parties, the EE TWG, and file with the PUC its 2021 Year-End Report no later than May 1, 2022. This report will include achieved natural gas and electric energy savings in 2021 and earned incentives for 2021.
- The Company will provide the Parties and the EE TWG with a summary of evaluation results that have been incorporated into the Annual Plan within the annual plan. including a description of the impact of those results in planning the Company's 2021 programs, in the Plan to be filed by October 15, 2020.

17. Requested Rulings

The Company respectfully requests that the PUC approve the 2021 Annual Energy Efficiency Plan as presented in this document and the supporting attachments in its entirety. The plan has been developed with careful consideration of the linkages between all parts. The specific components of this plan for which the Company requests approval include:

- The savings goals, programs, measures, budgets, and associated customer collections required to fund the energy efficiency programs in 2021.
- The pilots, demonstrations, and assessments the Company proposes for program year 2021 and the associated budgets and customer collections required to fund those efforts.
- The performance incentive mechanism and associated earning opportunity as included in the three-year plan and included in this Annual Plan.

Attachments
2021 Energy Efficiency Plan

ATTACHMENTS

Annual Plan Attachment 1. Residential and Income Eligible Energy Efficiency Solutions and Programs

Annual Plan Attachment 2. Commercial and Industrial Energy Efficiency Solutions and Programs

Annual Plan Attachment 3. Evaluation, Measurement & Verification Plan

Annual Plan Attachment 4. Rhode Island Benefit Cost Test Description

Annual Plan Attachment 5. Electric Energy Efficiency Program Tables

Annual Plan Attachment 6. Gas Energy Efficiency Program Tables

Annual Plan Attachment 7. Rate and Bill Impacts

Annual Plan Attachment 8. Pilots, Demonstrations & Assessments

Annual Plan Attachment 9. Cross-Program Summary

Attachment 1

2021 Residential and Income Eligible Energy Efficiency Solutions and Programs

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1. Overview

2021 is a pivotal year for residential energy efficiency programming. It marks the completion of the transformation of the residential lighting market and the final year incentives will be offered for residential lighting at the retail level. This shift is the culmination of years of innovation and intentional program design resulting in the successful evolution of the residential lighting market. The first year of the 2021-2023 Three-Year Energy Efficiency Plan seeks to initiate a similar transformation in the way Rhode Island homes use energy for heating, cooling, and hot water. The vision is to support the creation of super-efficient homes that help customers maximize their use of efficiency and expand the range of clean energy options. This vision is for all homes to be effectively insulated, have safe and efficient heating, cooling and hot water systems, encourage customers to see their home as a comprehensive system, and transform the residential new construction industry to a Zero Net Energy market.

The detailed program descriptions provided in the attachments to each Annual Plan offer snapshots and evidence of how programs are continuously evolving, building from one Plan year to the next. They show how high-level strategies are translated into specific actions and activities that secure savings for customers; help to contextualize specific program innovations and enhancements described only briefly in the main text of the Annual Plan; and demonstrate how key strategies cross multiple program designs and end use targets.

The detail in this attachment is designed to allow stakeholders, the Public Utilities Commissioners and staff, and other interested parties to delve deep into and fully explore the complex interplay between specific customer and building types, program implementation and delivery, incentive design, and high efficiency technologies.

What to look for in 2021

The Company has focused heavily across all residential programs to supercharge weatherization, efficient heating, and hot water. The elevation of these three critical areas reflect stakeholder priorities and opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the EERMC and the EERMC consulting team, OER, the Division, our vendors, and customer feedback. There are new bundled incentive designs, enhancements that make participation in multiple programs easier or more attractive, and reduced barriers to adoption of comprehensive measures.

Equity and workforce development objectives have been applied across all residential programs, resulting in program design shifts and investment prioritization to ensure all Rhode Islanders have access to program opportunities and that we succeed in building the workforce infrastructure that can deliver on the vision of transitioning to high performing technologies while also creating robust jobs and economic development opportunities for Rhode Islanders. Of particular note, the Energy*Wise* program

is expanding the 100% incentive design for moderate income customers and the Income Eligible Services (IES) program is working closely with the company discount rate program to actively bring more customers into the income eligible program where 100% of costs are covered. To support development of high growth long term energy jobs that support the shift to high performance homes and technologies, ASHP installation and design training and Zero Net Energy New Construction trainings are planned to rebuild and expand the workforce to support the emphasis on deeper home energy upgrades.

Residential and Income Eligible Programs

The Company offers the below overarching programs to provide comprehensive services to two regulatorily defined sectors, market rate and income eligible:

Table 1. Residential and Income Eligible Programs

Energy*Wise* Single Family	**Income Eligible Single Family**
Multifamily	**Income Eligible Multifamily**
Residential New Construction	
Home Energy Reports	
ENERGY STAR® Lighting	
Residential Consumer Products	
Residential High Efficiency Heating and Hot Water	
Residential Connected Solutions	

This attachment provides detailed descriptions of the residential energy efficiency and active demand programs, including detail on the market (customer/building types) targeted, eligibility requirements, offers, the implementation and delivery design, and new items for 2021, along with the rationale for changes in a table format.

The Company will continue to focus on pilots, demonstrations, and assessments; please refer to Attachment 8 for a detailed scope and list for each pilot, demonstration, and assessment proposed for the 2021 Energy Efficiency Plan.

Program Description Structure

In order to streamline PUC, stakeholder, and reader access to the most pertinent program information in the 2021 Annual Plan, the Company has adopted the following structure for each of the programs:

Eligibility Criteria (i.e. Customer/Building Type)	This section describes which customers and/or building types are eligible for participation in the program or initiatives.

Offerings	This section describes the offers available to customers under the program or initiative. It can include technical assistance, incentives, design support, verification services and financial offerings. This section also describes the various pathways by which a customer or building can participate in a program or initiative.
Implementation and Delivery	This section describes the process by which the Company engages the customer with energy efficiency programs and offerings.
Customer Feedback	Customer feedback can be received by the Company in various ways; via an implementation vendor, direct feedback from the customer, via surveys conducted by the Company.
Changes for 2021	The section captures the changes proposed in the year stated.
Rationale for Changes	Captures the rationale for the changes proposed in the planning year.
Proposed Upcoming Evaluations	Evaluation information can be found in this section at the program level. Initiatives like the Grocery Initiative or the Industrial Initiative are typically not evaluated. The measures included in these initiatives are evaluated as part of larger evaluations for the programs. Hence at the initiative-level tables you will not see this "Proposed Upcoming Evaluations" section.
Notes	Additional notes related to the program, customer, offerings etc.

Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane[1])	Budget ($000)	Participation[2]
Electric						

[1] For a breakdown of program level energy savings goals see Attachment 5, table E6-A and Attachment 6, table G6-A for more details.
[2] For information on the metric used to measure participation by program, please reference the main text, section 4.5.

Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas				

The below Figures 1 – 8 compare the distribution of the residential and income eligible sectors' energy savings goals when measured in annual savings compared to lifetime savings. The lifetime metric captures the long-term energy savings whereas the annual metric shows the first year savings only.

Figure 1: 2020 Planned Distribution of Lifetime MWh Goals for Residential Electric Sector

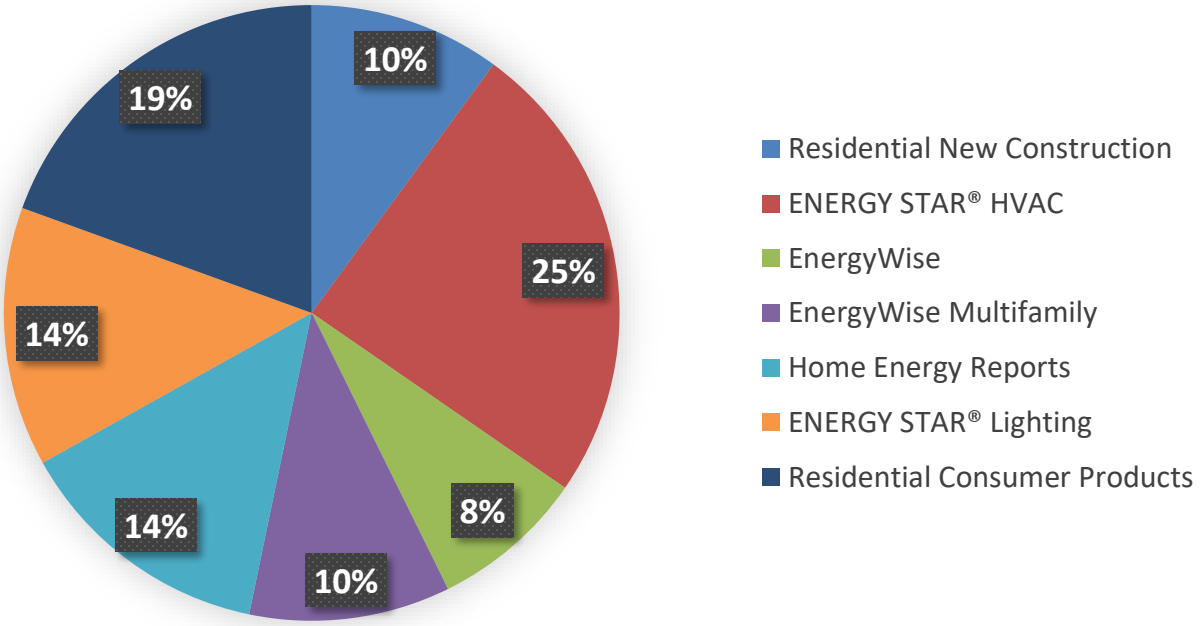


Figure 2. 2021 Planned Distribution of Annual MWh Goals for Residential Electric Sector

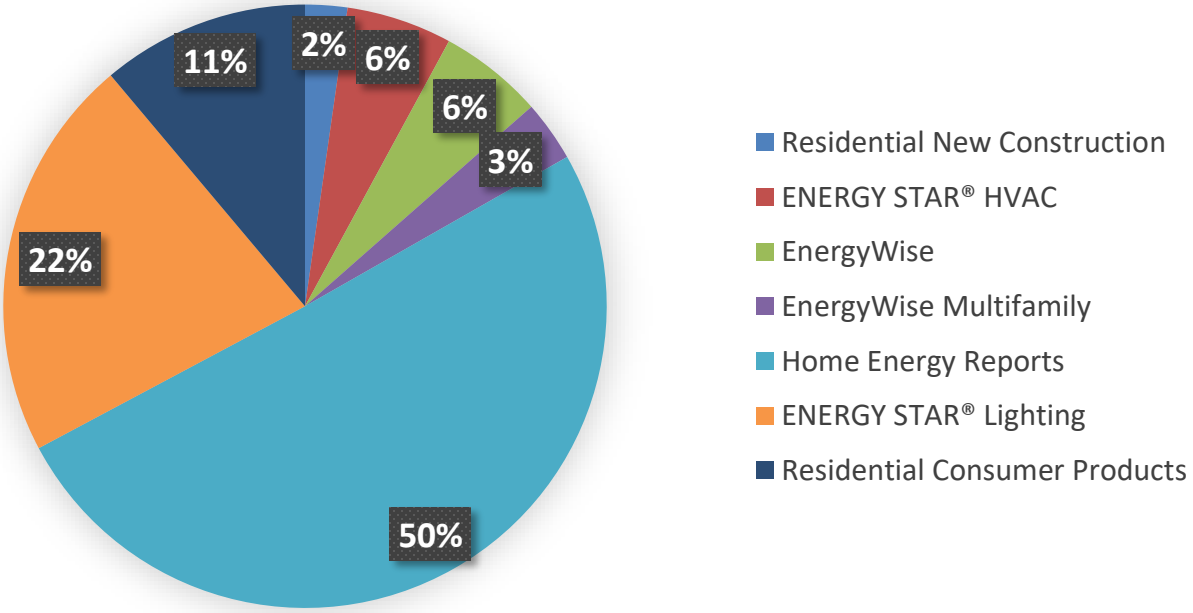


Figure 3. 2021 Planned Distribution of Lifetime MMBtu Goals for Residential Gas Sector

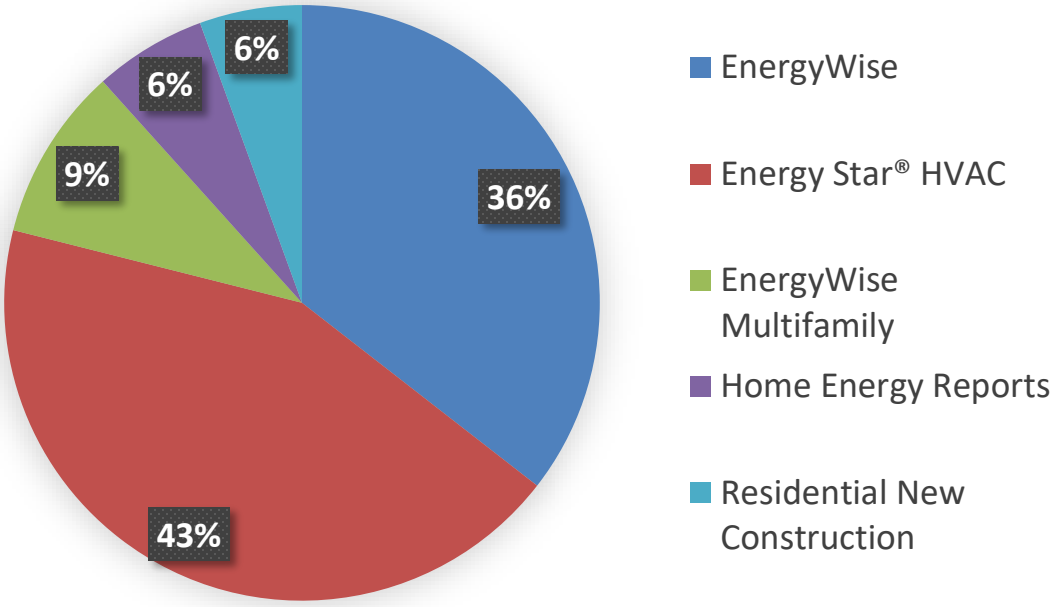


Figure 4. 2021 Planned Distribution of Annual MMBtu Goals for Residential Gas Sector

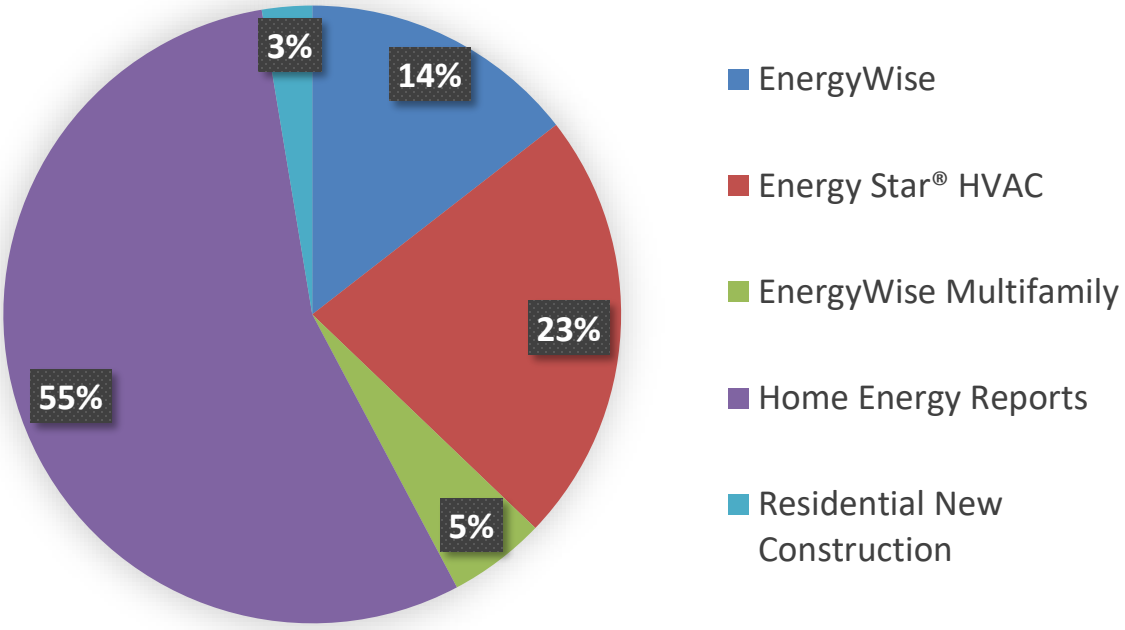


Figure 5. 2020 Planned Distribution of Lifetime MWh Goals for Income Eligible Electric Sector

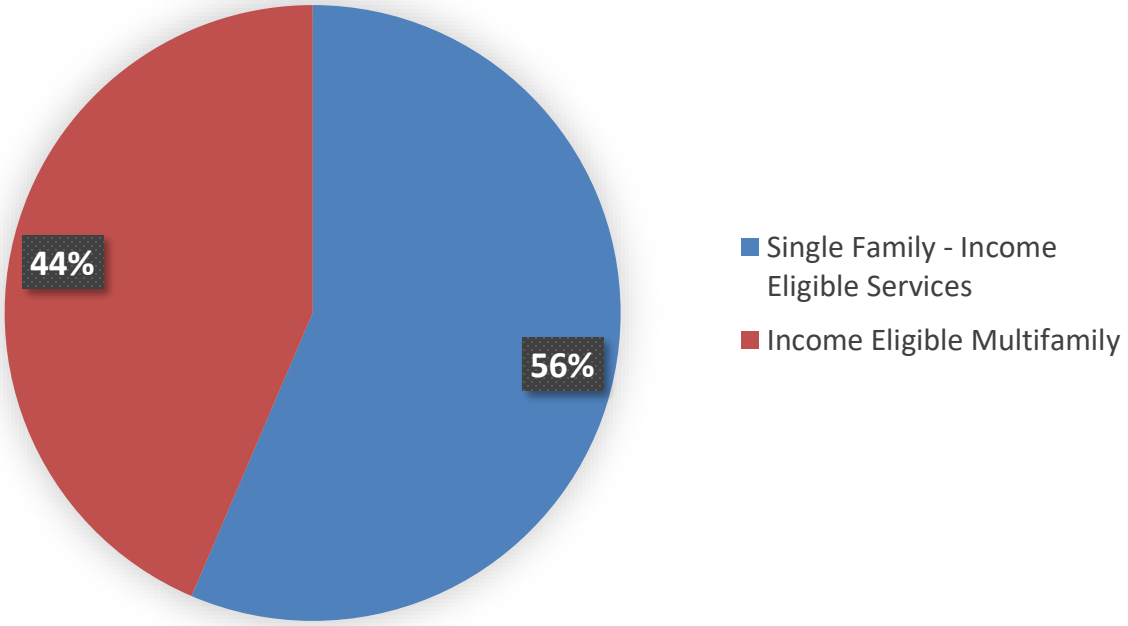


Figure 6. 2021 Planned Distribution of Annual MWh Savings for Income Eligible Electric Sector

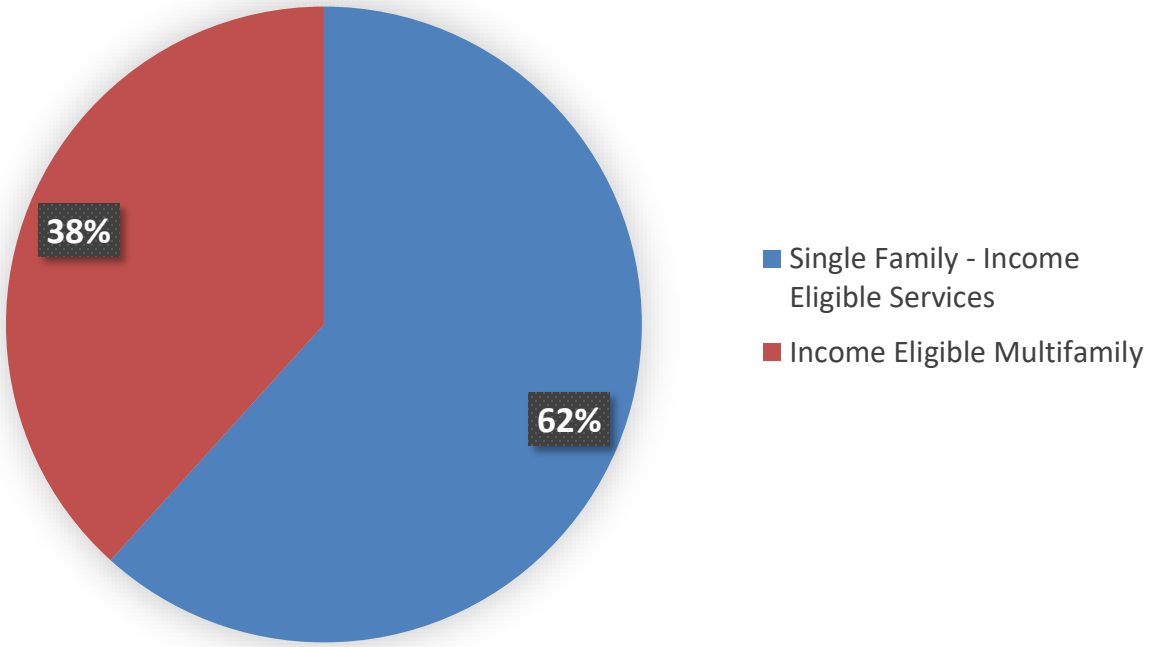


Figure 7. 2021 Planned Distribution of Lifetime MMBtu Goals for Income Eligible Gas Sector

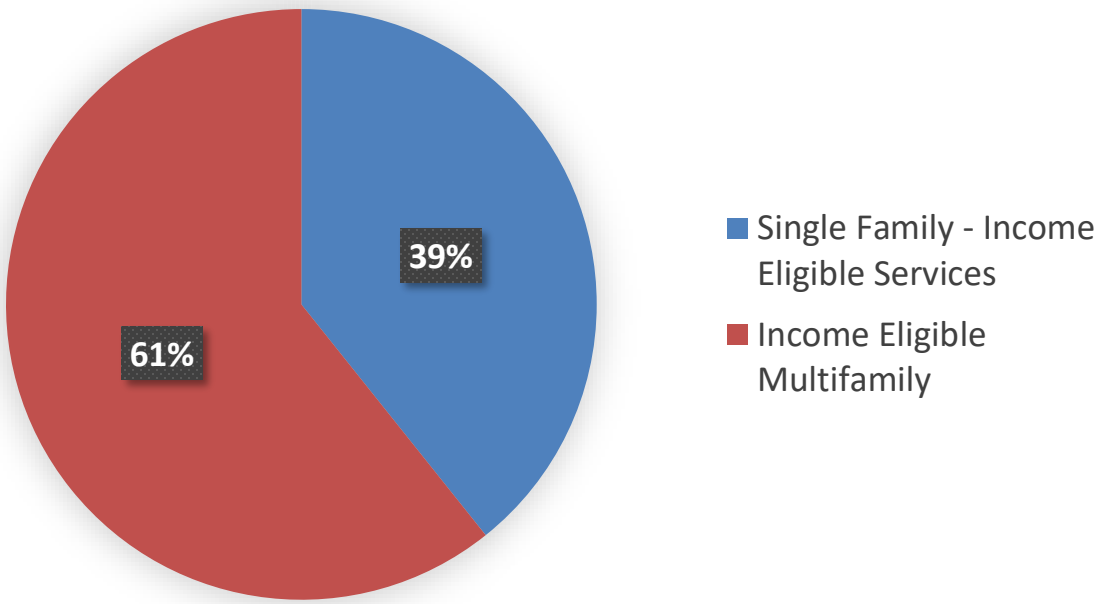
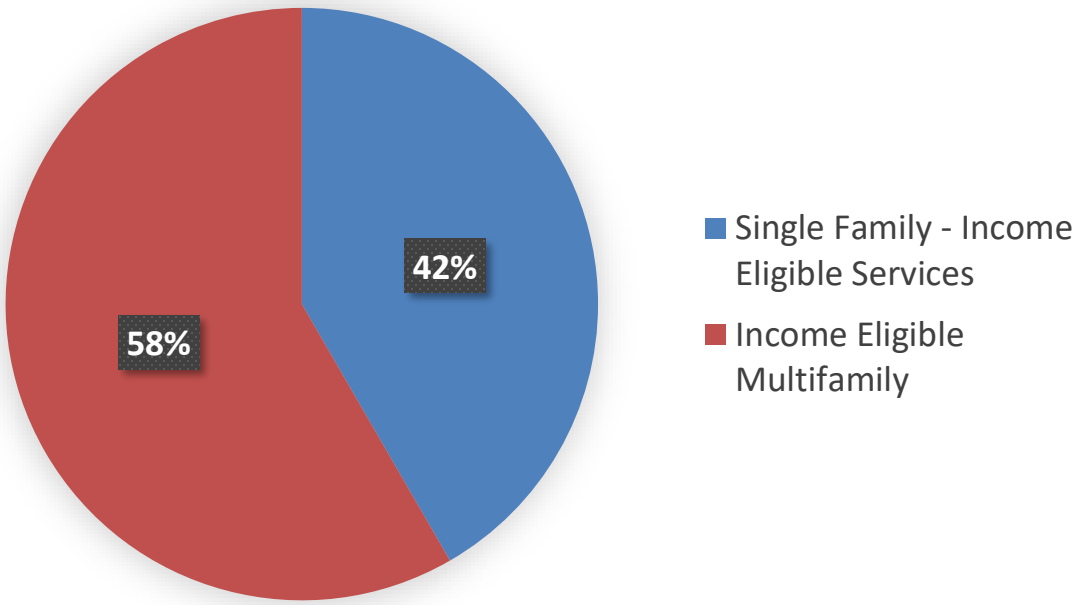


Figure 8: 2021 Planned Distribution of Annual MMBtu Goals for Income Eligible Gas Sector



2. Energy*Wise* Single Family (Electric and Gas)

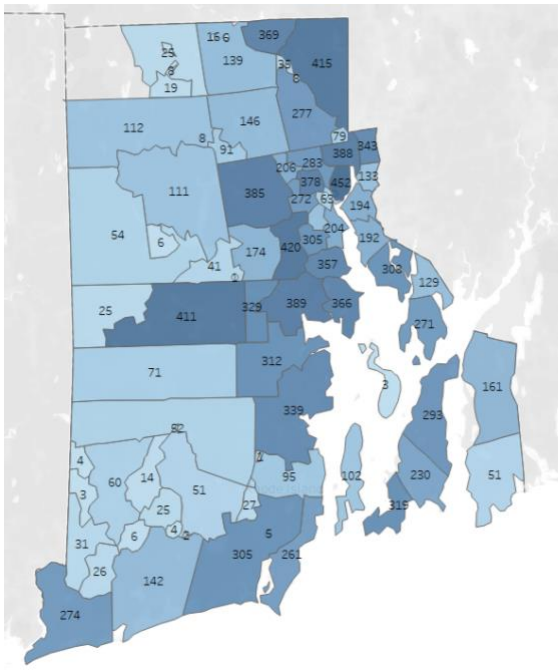
Eligibility Criteria	Energy*Wise* is the flagship in-home comprehensive energy efficiency offering for all Rhode Islanders in single family residences (defined as one to four units) that are not candidates for Income Eligible Services. All market rate customers with either an electric or gas National Grid account can participate. Homeowners, renters, and landlords are all encouraged to participate. Customers with any heating fuel type, including delivered fuels, are served as long as they have a National Grid account. Delivered fuel customers can receive services through their electric account.
Offerings	Energy*Wise* offers comprehensive energy efficiency services using a whole-house approach to identify energy saving opportunities in all major energy systems and uses, including heating and water heating systems, appliances, lighting, water saving measures, plug loads, and building envelope leaks. In 2020, EnergyWise was awarded an ENERGY STAR® Partner of the Year, Sustained Excellence in Energy Efficiency Program Delivery for the fifth consecutive year. 11,750 home energy assessments are planned for 2021. EnergyWise provides in-home services in two phases: home assessment and weatherization. **Home Energy Assessment** Historically, an in-home, no cost energy assessment was the entry point for customers into the Energy*Wise* whole home suite of energy efficiency services. The in-home assessment has been refined over many years to focus on helping educate participants on the home's energy use and providing them a comprehensive roadmap of opportunities for energy upgrades. During the in-home assessment, an energy specialist(s) will upgrade lighting, provide advanced power strips, and look for water saving opportunities. Applying a comprehensive, whole-house approach, the energy specialist will evaluate all major energy systems including the heating and water heating systems, appliances, lighting, water saving measures, plug loads, and tightness of the building envelope (the roof, the basement, and the walls). **Virtual Home Energy Assessment (VHEA)** In 2020, the COVID-19 pandemic prompted innovation with in-home energy assessments transitioning to a virtual experience (Virtual Home Energy Assessment, VHEA). Customers participating in the VHEA receive the energy saving devices traditionally installed by the energy specialist during the in-

	home visit through the mail. Customers are able to self-install the products or they can be installed when contractors are present during the weatherization process. As 2020 energy efficiency work evolves, the Company is continuously assessing how VHEAs may continue to fit within the Energy*Wise* offerings. The program is assessing how closely the weatherization scopes developed from a VHEA match conditions, needs of contractors implementing the weatherization work, and the cost implications. The Company is also closely observing customer satisfaction and acceptance of the VHEA as reported on email or postcard customer feedback surveys after each assessment and completed weatherization. For customers beginning their energy education journey or those who may not have time for or are reluctant to have an in-home assessment, the online home energy assessment captures the current state of the customer's energy usage and identifies opportunities for energy efficiency upgrades. If a customer takes the online assessment and determines they are interested in a virtual or in-person assessment, those opportunities are available to the customer. **Weatherization** The energy specialist's primary focus during an in-home assessment is to examine the opportunity to increase the home's building envelope through air sealing (decreasing air leaks) and increasing insulation, collectively referred to as "weatherization." Weatherization is the most cost-efficient way to improve a building's performance. It also offers customers a healthier and more comfortable home that will passively remain cooler in the summer and warmer in the winter, helping reduce energy bills for customers. Many health and safety considerations are addressed when weatherizing, such as adding attic ventilation or using mechanical fans to ensure a healthy air exchange rate. The recently completed Energy*Wise* evaluation, as well as additional research from prior assessments, identified a number of pre-weatherization barriers, generally health and safety or physical barriers, which prevent the continuation of weatherization until remediated. At this time, Energy*Wise* does not pay for remediation of the pre-weatherization barriers, nor are they included in the weatherization scope of work to be implemented by program contractors. The Company does not manage the process of hiring

	contractors to complete remediation. The Company recognizes, however, that if a customer learns that additional work not included in the weatherization scope is required before weatherization can proceed, customers may become confused or irritated. Therefore, the program provides a $250 incentive to certify that pre-weatherization barriers have been remediated. Additionally, some pre-weatherization costs can be included in the HEAT Loan. Additional research into solutions for pre-weatherization barriers will continue in 2021. National Grid and interested stakeholders are researching external organizations that may offer assistance or funding to remediate some pre-weatherization concerns. The Company will coordinate with these organizations to see if there are opportunities to coordinate efforts to make a more seamless process for customers. **Energy Action Plan** An Energy Action Plan is presented to the customer at the end of the assessment. The Energy Action Plan gives the customer a clear roadmap for upgrading their home, including a recommended path to weatherization (air-sealing, insulation, and duct sealing) and associated costs, including the company incentive and customer costs. The Energy Action Plan also provides the customer a streamlined path to engage a qualified independent insulation contractor to perform the weatherization work. The Energy Action Plan also details other potential energy upgrades and additional incentives the customer may be eligible for, including heating and hot water systems. Opportunities for financing the customer share of the weatherization (as well as other upgrades) are also provided at this time. If a customer accepts the Energy Action Plan recommendations and wants to move forward with weatherization, the customer signs a contract with the Lead Vendor and schedules a date for weatherization work. **Connecting Customers with Additional Opportunities** The Energy*Wise* assessment process also identifies opportunities to engage the customer in additional energy saving programs including HVAC, Consumer Products, and Connected Solutions. During home visits, energy specialists capture the age and condition of heating systems, the heating fuel type, and verify the number of stories in the home. This data is used to identify if homes are good candidates for high efficiency heating, cooling, and hot water systems such as air source heat pumps and hot water heat pumps. Homes meeting optimal building design with current electric

	heating and/or water heating systems are provided information about enhanced incentives for air source heat pump systems and automatically referred to the HVAC program for follow up. The Energy*Wise* assessment can identify if a home has central air conditioning and a smart thermostat, which allows the Company to offer these customers the opportunity to participate in the ConnectedSolutions program. To provide customers a full picture of all their clean energy opportunities, the energy specialist also performs a quick assessment survey to determine whether the home is a good candidate for solar. Additionally, the National Grid marketplace offers Energy Sage solar quotes at https://ri.home.marketplace.nationalgridus.com/content_solar_energy.html. **Moderate Income Customers** Energy*Wise* supports moderate income customers and renters with a 100% landlord weatherization incentive, which encourages landlords to weatherize homes by removing any direct costs for the landlord. Renters then benefit with lower energy bills and a more comfortable home. In 2021, the Company will also expand the 100% weatherization incentive to moderate income customers directly, described further in 'Changes for 2021' below. Homeowners with less than perfect credit scores can take advantage of the lender of last resort, which makes 0% Heat Loans available to these customers.
Implementation and Delivery	Energy*Wise* is delivered through a Lead Vendor model where the Lead Vendor provides assessments and schedules weatherization projects with the Independent Insulation Contractors that provide weatherization services (air sealing and insulation). The Lead Vendor provides 100% quality control for all weatherization work. The Lead Vendor model facilitates consistent assessments for customers and allows the program to incorporate testing of new concepts as well as generating leads for other programs. The RI program design has consistently been recognized as best in class with five years of ENERGY STAR® Partner of the Year awards for program implementation. A customer begins the home energy assessment process by either calling, emailing, or mailing an expression of interest and the initial in-home

	assessment is scheduled. The assessment generally takes 1.5 - 2.5 hours with an energy specialist(s) going through the home with the customer. This provides the customer one-on-one education about how their home is currently operating and helps them understand how recommended upgrades will improve their efficiency and comfort. At the completion of the assessment, participants decide whether to take action on recommended energy upgrades. When a customer agrees to proceed with recommended weatherization, the customer is connected with an insulation contractor and a visit is scheduled to install the weatherization upgrades. The customer can apply for 0% financing through the Heat Loan to finance the customer costs associated with the upgrade(s). Financing the energy upgrades requires selecting an approved lender and applying for the loan. For customers with less than perfect credit, there is a lender that specializes in financial coaching and approves Heat Loans for energy upgrades. Prior to the actual weatherization, communication occurs with the customer to ensure their home is prepared for the activity and that an adult will be at home in case questions arise. To allow the insulation contractors to efficiently air seal and insulate, customers must provide clear access and remove all personal items from the attic, basement, and exterior walls. Before the insulation contractor closes the job, the Lead Vendor provides a quality assurance check of all weatherization work to verify that all work has been completed. This process minimizes return visits and complaints from customers. In response to COVID-19, the Company fast tracked and implemented a Virtual Home Energy Assessment. The virtual assessment follows a similar education and information capture process as the in-home assessment with a “live” virtual energy specialist. The virtual assessment generally takes one hour and is conducted by phone or video call. The specialist may request information from the customer in advance of the virtual assessment such as pictures of their attic, lighting fixtures, the exterior of their home, and heating and hot water systems. Also in response to COVID-19, the Company increased marketing and employed innovative methods to reach customers and deliver information in response to the new conditions and challenges of the pandemic. This included developing a video and buying advertisements at drive-in movie theaters, as well as over-the-top (OTT) and connected TV (CTV) ads, which play before streamed programming.

	Additionally, an online energy assessment, which is available 24-hours a day, allows a customer to learn more about their home's energy usage at their own convenience. The online assessment takes five to ten minutes to complete and immediately provides insights on what items use the most energy in the home, energy saving tips, and opportunities for energy incentives. The customer can also decide if they would like to sign up for a virtual home energy assessment after the online assessment. The online assessment also provides the Company upgrade opportunities for heating and hot water systems. *Figure 8. Household Participation in EnergyWise by Zip Code in 2019* 
Customer Feedback	Customers are surveyed after both the initial assessments and subsequent weatherization work. Customers consistently rank their satisfaction at or above 97% out of 100%. Customers are generally pleased with the upgrades provided during the assessment and impressed with the professionalism and care taken by the insulation contractors. When feedback indicated customer dissatisfaction with long wait times for a home assessment, the Company responded immediately by contracting more energy specialists to reduce the wait time. An interim communication letting customers know they are still on the list to receive an assessment along with other energy saving tips were added to the customer's experience.

	Review of customer satisfaction scores during the COVID-19 pandemic shows higher customer satisfaction with in-home home energy assessments as compared to virtual assessments.
Changes for 2021	A **Smart Plug assessment** will be added to the suite of Energy*Wise* services to capture potential savings from customers who "always leave on" their appliances and to build customer engagement around more control over household products. Energy*Wise* will **continue to offer Virtual Home Energy Assessments in 2021** while gathering insights on alignment of weatherization scopes and conditions, contractor needs, cost implications, and customer satisfaction. Customers will be able to elect from either an in-home or virtual assessment. In the event that in-home assessments are once again suspended related to COVID-19, VHEAs will again become the primary type of assessment. Energy*Wise* will **continue the 100% weatherization incentive for moderate income customers initiated during COVID-19**. Weatherization was identified by the Market Potential Study to have high savings potential and this offering will provide opportunities for more customers to participate in weatherization. Development of a moderate income definition and design of the offering will occur during the first half of 2021, with implementation beginning in Q3. Ideally the Company will work with an organization that can either income qualify customers or determine an accepted definition of moderate income that minimizes the qualification burden on the customer. The Company will **increase marketing to encourage renter and landlord participation** in Energy*Wise* and will continue the 100% weatherization incentive for landlords, expanding energy efficiency benefits to moderate income customers. The Company will **design a bundled enhanced incentive that supports customers who commit to comprehensive savings** by combining weatherization with another major energy system, such as heating and cooling or hot water heaters. Program design will occur in Q1 and Q2 along with beta testing and optimization and will roll out on a limited basis in Q3 and Q4 to help refine the offers and customer support systems, with full implementation planned for 2022.

	Energy*Wise* will **begin facilitating connections to HVAC and/or electrical contractors** if the customer does not have a preferred vendor to assist with pre-weatherization barriers. Energy*Wise* will continue to work as a source of energy information for other energy saving programs and **increase customer connections to other programs**. For example, energy specialists will verify the presence of central air conditioning and Smart thermostats during in-home assessments, two criteria necessary for participation in Connected Solutions. For homes meeting optimal building design and heating fuel types for the electrification of heating and hot water systems, specialists will provide information about enhanced incentives and automatically refer customers to the HVAC program. The Company will continue work begun in 2020 to **identify companies that use publicly available information to develop initial home energy efficiency scores**. In 2020, National Grid will issue a Request for Information to determine the landscape of companies that can provide an energy score based on public data/data mining. These scores can then be updated based on customer input and/or program participation, starting with the online assessment, and subsequently in-person assessments or VHEAs. This research will help inform opportunities for the program in 2022. Energy*Wise* will also **research whether residential customers would be interested in an on-bill feature** to spread out customer costs associated with energy efficiency upgrades. This research would ideally leverage other research opportunities such as the residential non-participant evaluation or C&I research on financing. Additionally, the Company is **jointly sponsoring research with other utilities** through ESource and ICF to advance the evolution of incentive design through the Incentive Project. This research will explore how lessons from academic research can be applied to consumer behavior, pricing, and discounting theory to influence incentive design. One aspect of the research will view incentives and financing opportunities holistically.
Rationale for Changes	**Smart Plugs:** Internal National Grid ethnographic research indicates energy savings potential for Smart Plugs when strategically placed in high use, easily forgotten use cases. For example, a customer mentioned a coffee machine that heats water all day long, ready to brew a cup of coffee, despite only being used in the morning. With a Smart Plug, the customer

could turn on machine in the morning and turn off remotely from work or another part of the home, turning on again if a second cup is desired. Similarly, another customer mentioned a space heater in the basement playroom they were never sure if the children turned off. A Smart Plug would allow the customer to check on the status of space heater at any time, maximizing energy savings and convenience.

Continue the 100% weatherization incentive for moderate income customers: This supports equity priorities shared with our stakeholders by enabling consumers most likely to face financial barriers to benefit from energy efficiency. The Company saw a strong increase in weatherization in 2020 during the COVID-19 pandemic when the 100% weatherization incentive was offered, which helped increase the number of customer conversions. While conversion to weatherization is generally around 35% - 40%, conversion increased to 65% with the 100% incentive during the 2020 COVID-19 pandemic. Expanding the incentive to moderate income consumers helps to achieve both savings and equity priorities.

Increased marketing to landlords and continuation of the 100% incentive: The Massachusetts' Energy Efficiency non-participant research indicates the renter designation as a proxy for moderate income households. Thus, increased marketing to landlords and continuation of the 100% weatherization incentive for landlords helps support energy efficiency for renters and moderate-income customers. Since the 100% landlord incentive was first offered in 2019, the Company has seen increased weatherization by landlords, as well as increased renter participation in the assessment portion of the program.

Renter Participation in Energy*Wise*		
Year	Renters	% of Total Participants
Assessment		
2018	996	9.4%
2019	1,361	11.0%
2020	516	11.6%
Total	2,873	
Weatherization		
2018	180	5.0%

2019	319	6.9%	
2020	142	8.5%	
Total	641		

Bundled enhanced incentive: The bundled enhanced incentive encourages comprehensive energy efficiency savings through participation in multiple programs and drives customers to invest in the deepest residential energy efficiency opportunities. At this time, the enhanced incentive will include weatherization, heating and cooling systems, and hot water heaters. Design of this offering will occur in 2021 with the enhanced incentives applicable to investments made across the 2021-2023 program years.

Facilitating connections to HVAC and/or electrical contractors: Upwards of 45% of all home energy assessments have some type of pre-weatherization barrier that prevents the customer from moving forward with the weatherization project. If the customer does not have a contractor with whom they are comfortable working, it can take additional time to obtain multiple quotes for a remediation project. To simplify the process, the Program will facilitate connections to HVAC and electrical contractors that resolve the most common types of pre-weatherization barriers, removing one additional task for the customer. The alleviation of pre-weatherization barriers was also a recommendation from the recently completed Energy*Wise* evaluation.

The Company is excited to participate in the Incentives Project research project. Many industries have sophisticated methodologies for incentive design and the goal is to learn from these best practices and see how they can be applied to the energy efficiency area.

Proposed Upcoming Evaluations	The Company is currently reviewing preliminary results of 2020 process and impact evaluations of the Energy*Wise* program.
Notes	

Energy*Wise* Single Family – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	14,788	2,861	452	475,370	17,033	11,750

Energy*Wise* Single Family – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	549,037	23,963	10,063	1,966

3. Multifamily (Electric and Gas)

Eligibility Criteria	Eligible Multifamily program participants are defined as the following:[3]
	• Buildings with five or more dwelling units
	• Properties consisting of four or more one- to four-unit buildings that meet both of the following requirements:
	  ○ Are within a reasonable geographical distance[4] from each other, or to a five plus unit building, and
	  ○ Are owned by the same individual or firm.
	
	Both market-rate and income-eligible multifamily properties are subject to the above multifamily eligibility requirements for coordinated services. For the income-eligible properties, co-payments for energy efficiency services and measures are 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; or
	• 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).
	
	All customers who have an electric account with the Company are eligible, regardless of their heating fuel type.
	
	A multifamily property may be eligible for services and incentives under both residential and commercial programs. As an example, a building with 20 dwellings 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

[3] Stand-alone one to four 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.

[4] "Reasonable geographical distance" is determined at the discretion of the vendor. The prior program guidelines required buildings to be neighboring each other. This revised guideline will allow the vendor to treat more units for a single owner where those units may be located down the street from each other.

	incentives through both 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 to ensure equity for all customers, funding energy efficiency through the energy efficiency program charge. In contrast, the customer will not need to deal with this added layer of complexity and will instead receive a consolidated incentive for all efficiency work completed at the site.[5]
Offerings	The program offers comprehensive energy services for multifamily customers including energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting, appliances and air source heat pumps. Coordinated services will be offered for all types of multifamily properties.
Implementation and Delivery	The Rhode Island Multifamily program has a single Lead Vendor that utilizes a network of Rhode Island sub-contractors to serve all customers, including income eligible customers. A customer contacts the Multifamily vendor to express interest in receiving an energy assessment. A “pre-assessment” is done over the phone or in person to determine if the customer is eligible for participation in the program based on the aforementioned criteria. An energy assessment is then scheduled with the facility’s authorized representative. An energy assessment is completed by an energy specialist to identify ways to conserve electricity, natural gas, or delivered fuels. The Lead Vendor then conducts post site screening to identify which measures pass a benefit/cost (B/C) screening on a project level basis. If a measure does not pass, customers can still include it in the project without an incentive. A final proposal is then presented to the customer that includes the scope of work, costs, available incentives, and an estimated time frame. The customer is made aware of financing options available to them as well. If the customer decides to proceed with the project, installation work is then scheduled. Once installation work is completed, a final walk through with

[5] For the past four years the vendor has offered a Multifamily Coordinator for RI customers interested in participating in the multifamily program to reduce any confusion and ensure a smooth enrollment process.

	the customer is done. A completion report is then created and presented to the site's authorized representative and signed off on.
Customer Feedback	Post project customer surveys are conducted and have high satisfaction results. Surveys are scored on a scale of 0 to 100 with such questions as: • On a scale of 1 to 5, how satisfied are you with the energy efficiency services you received? • On a scale of 1 to 5, would you recommend this service to family, friends, and/or colleagues? The most recently available average survey score for 2019 is 90.4.
Changes for 2021	**Continue to examine a tiered incentive approach.** A tiered incentive approach encourages building owners and facility managers to include more residential unit owners in multifamily projects. Offering an additional incentive for the participation of additional residential units benefits the program as a whole and helps increase customer participation and energy savings. In 2021, the Company will continue to explore this opportunity to restructure incentives to increase program attractiveness to more customers. **Provide greater customer choice to the condominium market.** In 2020, the Company worked with the multifamily vendor to implement greater customer choice by allowing customers to choose their own HVAC contractor and providing a turnkey project approach. These changes make participation easier for individual condominium owners, who often have a preferred HVAC contractor through their condominium association. In 2021, the Company plans to build on this progress by assessing the impact of providing customers with the option to choose their own contractor and examine any further barriers that could be removed to make participation in energy efficiency programs simpler for condominium owners. Taking this step will provide customers with greater choice, open energy efficiency project opportunities to more contractors which may drive down project costs, and increase participation among all multifamily facilities. **Implement recommendations from Multifamily Impact and Process Evaluations.** The Company received results from the Impact and Process Evaluation of the Market Rate and Income Eligible Multifamily programs in August 2020. The process evaluation examines customer participation, vendor participation, and overall program processes. For 2021, the Company plans to utilize the results of this evaluation to make several

	improvements to program design of the multifamily programs. Firstly, the Company will work with its multifamily vendor to increase facilitation of health and safety barrier remediation by providing customers with more information about how to complete remediation and how to locate a local remediation contractor. The Company will also examine whether a pre-weatherization barrier incentive could help customers overcome barriers, and if so, how it should be structured. Secondly, the Company will set clearer program expectations with customers by updating language and redesigning the customer energy report and customer sign-up sheet. Thirdly, the Company will work to identify the long-term role of virtual energy assessments in multifamily buildings. The complexity of multifamily buildings makes it difficult to conduct a full and adequate virtual assessment. However, the Company plans to incorporate virtual processes to improve the overall assessment efficiency, such as initial conversations with property managers and reviewing property records and building data before arriving on-site. Results from these evaluations will also inform the Request for Proposal (RFP) for the Rhode Island multifamily program's vendor for the upcoming three-year plan (2021-2023). **Leverage the Multifamily Census to improve marketing.** Based on the findings of the forthcoming RI Multifamily Census to be completed in 2021 (see Upcoming Evaluations below), the Company plans to implement targeted marketing efforts to newly identified five to 20 unit small- and medium-sized multifamily owners, newly identified income eligible properties, and other newly identified properties that have not been served by the program to date. In the interim, and beginning in 2020 through 2021, the company will track and report renter participation when serving condo units. **Research the value of tax incentives.** The Company will utilize customer research planned for 2021 to further explore the value of tax incentives for multi-family programs. The Company hasn't committed to doing a separate research study solely focused on tax incentives. However, it will commit to including tax incentives in its research to understand and identify potential drivers and motivations for increasing customer participation in multi-family programs in future years. **Coordinated Income Eligible cooling options.** In response to feedback from Public Housing Authorities and the Multifamily vendor regarding the challenge of providing cooling options for occupants of income eligible buildings during increasingly hot summers, the Company designed an

	integrated option for these buildings starting in summer 2020 with further roll out in 2021. The Income Eligible multifamily program is now able to offer no-cost replacement of inefficient window air conditioners with efficient models. Through coordination with the Residential Consumer Products program, the multifamily vendor can assist public housing authorities with bulk application of rebates and purchasing of new window air conditioners for tenants who previously had no air conditioner at all. Furthermore, the vendor will continue assessing income eligible properties with electric resistance heat for heat pumps and prioritize installation in time for tenants to use the cooling function on their new heat pumps. The Company will develop additional educational materials for new heat pump users to familiarize themselves with the technology and optimize their use, which is especially important in multifamily buildings. **Improve customer financing options.** Current options for financing of energy efficiency upgrades in multifamily buildings are limited to individual condo owners through the HEAT Loan program, with no option for landlords looking to finance upgrades to their renter-occupied property. In 2021, the Company will explore improvements to the HEAT Loan program that will provide financing options for landlords of both commercially and residentially metered multifamily buildings. This improvement would make it easier for owners to fund larger improvements to renter-occupied buildings, and therefore achieve deeper energy savings. **Revisit co-branded marketing.** The Company commits to internally reevaluate its current guidelines regarding co-branding with the Multifamily program vendor and assess whether these guidelines could be modified to allow wider opportunities for co-branding with the vendor currently in place. Allowing more prominent placement of the Company's logo on vehicles and staff uniforms during interactions with customers may lead to greater trust and ease and therefore greater participation in the Multifamily programs. **Improve sales acumen of energy auditors.** As the program shifts from inexpensive, direct install measures to more complex and expensive measures, energy auditors will need increased sales acumen to help customers understand the value of energy efficiency upgrades. As part of its increased focus on workforce development, the Company plans to invest in professional development for energy auditors in the Multifamily programs by providing them with sales training in 2021, which the Company believes

	should increase the amount of deeper energy savings measures adopted by multifamily participants.
Rationale for Changes	From 2018 through 2020, the Multifamily program's electric energy goals have been challenged based on vendor feedback of a more rapid decline in opportunities for lighting savings than was anticipated. In 2018 and 2019, energy savings from LED lighting made up the majority of the annual electric energy savings goals for the multifamily programs. In 2018 and 2019 this led to underperformance of the multifamily market rate electric program and the multifamily Income Eligible electric program. Halfway through 2020 there is an indication that the multifamily Income Eligible electric program will finish the year closer to its annual MWh goal, however the market rate electric program is on track to perform below 2018 and 2019 levels. Annual participation data for 2012-2019 also indicate that the multifamily sector programs, particularly market rate electric and gas and, to a lesser extent, income eligible electric, are approaching market saturation. From 2012-2019 in market rate multifamily, 41% of gas customers and 47% of electric customers were repeat participants, compared with 8% in gas and 13% in electric for Energy*Wise* single family. In Income Eligible Multifamily during the same period, 21% of gas customers and 31% of electric customers were repeat participants, compared with 6% in gas and 21% in electric for Income Eligible Single Family. It is in response to these program challenges that the Company has proposed a suite of changes to the Multifamily program in 2021 to ensure continued energy efficiency benefits for these customers and deliver savings going forward.
Proposed Upcoming Evaluations	**Multifamily Census Study:** In 2021 the Company will undertake a census of all multifamily properties in Rhode Island, using best available data to both understand where these properties are located, their ownership status, whether they are likely to be income-eligible or market rate, and whether they have already been served by the Multifamily Program. After examining best practices from the Massachusetts Multifamily Census Study, the Company determined that the building stock in Rhode Island varies enough from that of Massachusetts to merit a separate study. Moreover, the Company will improve upon the research techniques of the Massachusetts study to yield the most relevant data to both understand Multifamily

	Program market penetration and identify additional targeted outreach opportunities to customers who have not yet participated in the program.
Notes	

Market Rate Multifamily – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	20,391	1,729	223	94,899	3,057	4,000

Market Rate Multifamily – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	148,675	8,633	1,492	4,000

4. Income Eligible Services (Electric and Gas)

Eligibility Criteria	The Income Eligible Services (IES) Program serves the following customers: • Household income equal to, or less than, 60% of Rhode Island's State Median Income Levels which are set each program year[6] **or** enrolled in National Grid's fuel discount rate plans, Electric A-60 rate and/or Gas 11, 13 rates[7]. • Customers enrolled in the Low-Income Home Energy Assistance Program (LIHEAP)[8], also known as "fuel assistance". • Homeowners and renters who live in a one to four unit building heated with electricity, natural gas, oil, propane, wood, or coal • Additional eligibility criteria, including the 50% rule,[9] shelter and group home eligibility, renter eligibility and repair or replacement eligibility are available in the RI WAP/IES Operations Manual. All criteria adhere to 10 CFR 440 requirements.
Offerings	IES consists of two, no-cost[10], in-home services to increase comfort in the home and decrease a customer's energy costs. **Appliance Management Program (AMP) Assessment** • The energy specialist educates the homeowner or tenant about their energy bill and monthly usage; assesses the home and learns about the day-to-day activities that consume energy in the home; discusses ways the customer can save energy and money, educates the customer to properly operate energy efficient equipment and how to identify signs that indicate if weatherization or heating system replacement is needed. • Installation of instant energy savings measures such as energy efficient LED bulbs, advanced power strips, water saving measures (faucet aerators and low-flow showerheads).

[6] http://www.dhs.ri.gov/Programs/LowIncomeGuidelines.php.
[7] https://www.nationalgridus.com/RI-Home/Bill-Help/Payment-Assistance-Programs
[8] https://www.benefits.gov/benefit/1572
[9] Customers that are not on the income eligible rate but live in a two- to four-unit building where more than 50% of the units are income eligible are also eligible to receive weatherization and health and safety services. This exception is referred to as the "50% rule".
[10] 100% incentive via the systems benefit charge (SBC) that funds all National Grid's energy efficiency programs. Customer incurs no cost for audit, weatherization or equipment replacement.

	• Evaluation of existing appliances: refrigerator, freezer, window air conditioning unit(s), clothes washer and dehumidifier to determine energy efficiency and eligibility for a no-cost replacement with an energy efficient appliance model. ○ Replacement of eligible existing inefficient appliances (including delivery and installation)[11]. **Weatherization and Heating System Assessment** • An industry-certified energy specialist conducts a comprehensive assessment of the building envelope and heating and cooling systems including visual and equipment-required inspections, infrared camera thermal imaging, combustion safety testing of heating system, energy efficiency testing of heating and cooling systems. • Air sealing, duct sealing and insulation upgrades in attic, walls and basement. • No-cost replacement of eligible heating or cooling systems if they are determined to be inefficient or unsafe. Applicable to all existing heating/cooling systems: electric, gas, oil and propane. • If home has existing electric resistance heat, the customer will be offered to replace it with energy efficient air source heat pumps (ASHP) that provide heating and cooling.

Implementation and Delivery	**Program Delivery:**
	
	• IES Program is administered through a Lead Vendor that is responsible for managing the implementation of IES work through the six Rhode Island geographically-based Community Action Program (CAP) Agencies.
	• The primary point for customers to enroll in the IES Program is through the CAP Agencies as they provide income verification and comprehensive resources for income eligible customers.
	• Other channels for enrollment are:
	  ○ Low-Income Home Energy Assistance Program (LIHEAP);
	  ○ Community Expos;

[11] All appliances are purchased/supplied through a central organization, SMOC, a nonprofit agency, to ensure that all delivery personnel meet National Grid's security and liability criteria, and all appliances meet IES Program requirements, warranty calls are handled expeditiously and properly documented and non-efficient appliances are removed and recycled safely and properly.

	○ Consumer Advocate appointments; and ○ National Grid's Customer Service Center[12]. • The IES collaborates with the State of Rhode Island Department of Human Services (DHS) Weatherization Assistance Program (WAP)[13] and the Low-Income Home Energy Assistance Program (LIHEAP)[14] to create synergy between the programs, which improves outcomes of all the programs. ○ Leveraged Funding: The IES Program benefits from leveraging LIHEAP funds, resulting in more customers being served. The amount of funds leveraged is approximately 35% of total customer incentive benefits for weatherization and heating system replacements. The LIHEAP funds also help pay for the remediation of non-energy related health and safety improvements, that if not remediated, would prevent a customer from receiving weatherization and/or heating system upgrades, i.e., roof repair and/or replacement, knob and tube removal, glass repair/replacement and carpentry. See ○ Figure 9, ○ Figure 10, ○ Table 2 below for illustrative examples that represent 2012-2020 funding sources, allocation of funding sources, and services provided with funding sources, respectively. ○ WAP funding is not leveraged/integrated but WAP provides training and equipment to weatherization Auditors. • CAPs provide the full suite of energy efficiency services including: ○ Income-eligibility verification ○ Customer education ○ Energy assessments ○ Installation of instant savings measures ○ Recommendations for energy savings measures ○ Coordination of home performance/HVAC contractors and appliance vendors that install weatherization and heating (space and hot water) measures

[12] (1-800-322-3223)
[13] overseen by the U.S. Department of Energy. http://www.dhs.ri.gov/Programs/WAPProgramInfo.php
[14] overseen by the U.S. Department of Health and Human Services. https://www.benefits.gov/benefit/1572

	○ Quality assurance/quality control (QA/QC) ○ KPIs are tracked to measure/improve consistency of Program delivery as well as drive performance of the CAPs. KPIs include: timeliness of administrative reporting, monthly/year to date spending compared to goals, participation numbers for AMP, electric & gas weatherization and heating system installations and cost. • The IES Program is marketed through the Program's marketing specialist as well as cross marketed at Community Expos, via the Consumer Advocates dedicated to the RI IES consumers, and the Company's call center. • Quarterly IES Best Practices meetings are held with the Company, the Lead Vendor, the CAPs, DHS, program vendors (i.e., lighting vendor, appliance delivery vendor), or speakers to address a pertinent topic. • Quarterly engagement of the Company, the Lead Vendor, CAPs, and DHS to ensure consistent implementation of IES best practices across Rhode Island. • On-going customer feedback and communication. **Customer Journey:** • A customer begins the process for a no-cost home energy assessment by going to their local CAP Agency to submit their information to determine if they meet the income eligibility requirements for participation in IES. • The CAP Agency will then schedule a no-cost AMP and/or Weatherization/Heating System assessment. In some cases, the AMP and Weatherization/Heating System assessments are separate due to the customer's past assessments, renting vs. owning, time availability or the CAP Agency's availability of two-person assessment teams. In 2021 the CAPs will continue a process using two-person teams where applicable to provide all energy assessment services in one visit. • Energy education is provided to the customer regarding the pre- and post-energy assessment process, opportunities to save energy, processes for receiving appliance or heating/cooling system upgrades and/or weatherization.

	• The CAP Agency will schedule all necessary follow-up services for insulation, air sealing, appliance and heating/cooling system replacements. All services and appliance and heating/cooling system replacement are provided at no cost to the customer.
Customer Feedback	The recommendations from the 2019 Process Evaluation included the addition of a new post-installation survey for weatherization and heating system services to compliment the AMP Assessment customer survey. These surveys, in conjunction with the KPIs instituted in 2020, provide the feedback necessary to highlight successes and identify areas for improvement. Through a more general process and to collect timely feedback from customers, following the AMP energy assessment as well as heating system and weatherization services, customers are provided with a pre-stamped survey card. To date in 2020, 95% of customers who responded were satisfied with the IES services, 96% of customers who responded were satisfied with the improvements to their homes, and 100% of the customers who responded were satisfied with the professionalism of the CAP employees (n=79). The Lead Vendor provides a tabulation of the survey results, and the anonymized data is presented at the IES Quarterly Best Practices meeting. This feedback provides the Lead Vendor and the CAPs with information about how to improve the program as well as celebrate the successes. Discussing the data as a whole at the IES Best Practices meeting allows the opportunity to create solutions if problems exist, as well as celebrate the success of the collective efforts of the six CAPs.
Changes for 2021	In 2021, the IES Program will focus on increasing the number of participants. COVID-19 has exacerbated the number of customers who may need extra support to secure energy efficiency services and who stand to benefit from them. The Company will work to **ensure applicable customers are enrolled in the discount rate program**, coordinating with National Grid's Consumer Advocacy Team to **cross-promote IES offerings when customers enroll in the discount rates** to support their ability to access comprehensive, no-cost energy efficiency services. As customers move to the discount rate, the Company proposes to create a welcome package to encourage participation in applicable efficiency programming.

	The program will **implement a third-party support model to expand CAP capacity to serve customers and ensure greater equity across CAP territories**. To support the CAPs in increasing participation, in an equitable manner, a third-party service provider will be made available to seamlessly conduct assessments and complete weatherization projects. The third-party support model will be developed with the CAP partners and possible formats will be tested in 2020. The Company will take the lessons learned from 2020 to develop an RFP for these services in 2021 and third-party support will continue to evolve to fit the needs of IES Program. Determination of success will include: • CAPs meeting/exceeding year end goals. Goals in 2020 were based on the total goals for the State of RI divided by the number of eligible customers in the agency territory. Both numerical goals and spending goals are promulgated, measured and communicated throughout the year. • CAPs utilizing the service to stay above a yet to be determined percentage of quarterly goals. • Improved timeliness for completion of weatherization services. The Company will **focus on the recommended improvements from the 2019 Process Evaluation**, specifically the following key areas. • Prioritize rebuilding and stabilizing the number of qualified AMP/weatherization and heating assessors. National Grid will prioritize the focus on supporting CAPs to promote assessor retention and will regularly track the number of assessors, as well as assessor turnover, as indicators of success. This process will complement the addition of the third-party service provider as outlined above. • Increase the number of customers who complete weatherization. Weatherization data will be collected and utilized to further improve the percentage of customers who weatherize their home. Areas of focus will be the timeline from recommendation to completion of installation and customer satisfaction. • Continue to review the effectiveness of the new non-Standard Work Specification (non-SWS) for all non-AMP projects to continue to improve consistency, rigor, cost, and efficiency. As one measure of National Grid's success identifying an expedited solution, the

	Company will track the amount of time assessors spend on each type of assessment (AMP, weatherization, and comprehensive). • Engagement with landlords on behalf of interested tenants, as CAP staff are best positioned to explain IES and successfully enlist their participation. The Company aims to increase renter participation to effectively improve the equitable share of program resources. National Grid will work to **increase awareness of the IES Program through coordination and partnership**. The Company will coordinate with State and market-based organizations to determine the need and/or benefit of hosting a consortium to continue to find ways to serve IES customers. If determined to be beneficial, the Company will work with stakeholders to organize and host the consortium with a goal of increasing the success of the IES program as well as the many other services available to the community. The IES Program will **work with CAPs on utilizing two-person energy assessment teams to streamline the assessment process**, conducting both AMP and weatherization/heating system services at the same time. The program will **develop a protocol for offering smart thermostats to homes with central AC to improve efficiency and operability** and align with ConnectedSolutions when possible. The program will **develop a new, holistic email marketing strategy that leverages personalization to promote IES**, displaying the regionally appropriate CAP agency based on the customer's service address. IES will also benefit from personalization's promotion of non-energy efficiency solutions, such as discount rate enrollments and forgiveness program enrollments.
Rationale for Changes	**Increase participation and enroll in discount rate:** The number of customers eligible for Income Eligible Services is expected to increase as a result of the COVID-19 pandemic and a robust IES program is critical to ensure equitable access to comprehensive energy efficiency services at no cost. The IES Program is working to ensure there are resources in place to serve the customers that are in utmost need of the no-cost energy efficiency services. **Develop a third-party support system to expand CAP capacity to serve customers**: Due to the pause and reduction in workforce at the six CAP Agencies during the COVID-19 pandemic, National Grid will remain focused

	on the availability of skilled energy professionals to deliver the rate-payer program equitably across Rhode Island. Adding third-party support will ensure CAPs have capacity to reach additional customers resulting from the COVID-19 pandemic, regardless of their size. **Recommended improvements from the 2019 Process Evaluation**: The 2019 Process Evaluation clearly outlined opportunities to improve the delivery model for improved performance and stakeholder and customer satisfaction including expediated assessments, transition to a mobile app for field work, and landlord engagement. However, the pause in field work during the COVID-19 pandemic did not provide the opportunity to fully develop, implement, and assess all of the Process Evaluation results, therefore improvements and analysis will continue into 2021. Continued implementation of recommended improvements will enhance program delivery, efficiency, and customer satisfaction.
Proposed Upcoming Evaluations	None planned for 2021. In 2019, Cadeo conducted a Process Evaluation for the Income Eligible Services Program which built off a report conducted by The Cadmus Group in 2014.
Notes	

Income Eligible Services – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	39,378	3,325	486	365,693	13,759	3,630

Income Eligible Services – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	226,500	11,325	6,739	1,161

Figure 9. 2012-2020 Funding Sources - Single Family Income Eligible EE Services

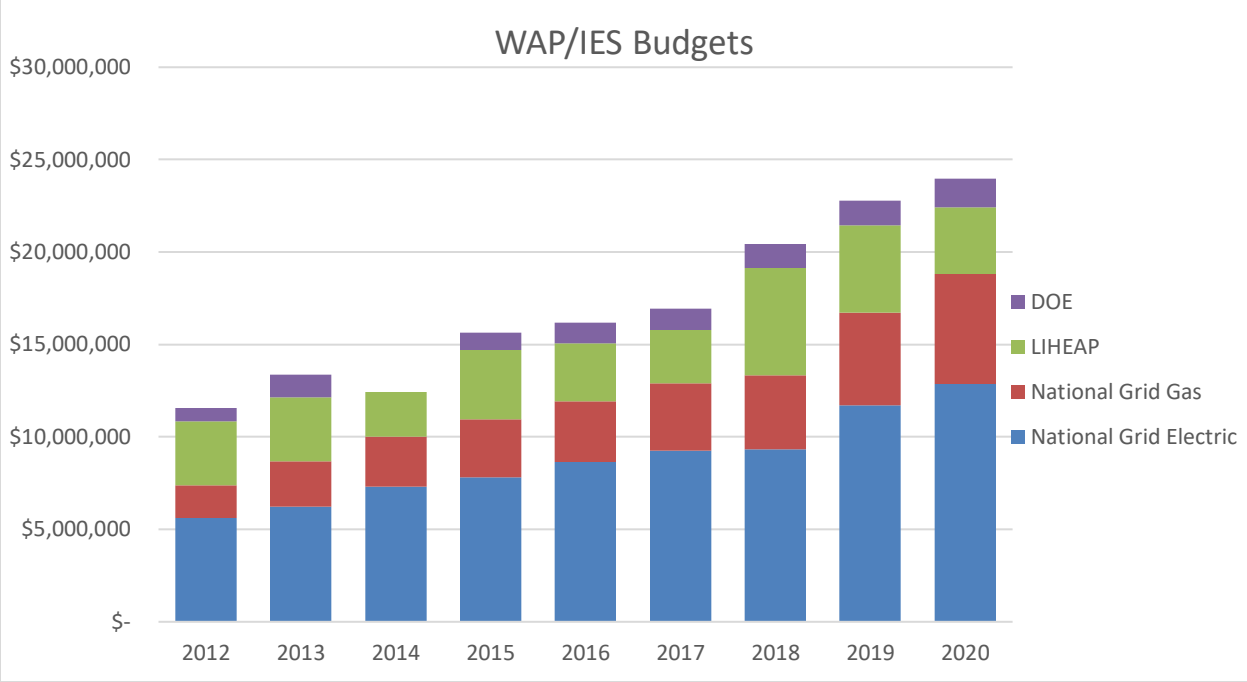


Figure 10. Allocation of Funding Sources - Single Family Income Eligible EE Services

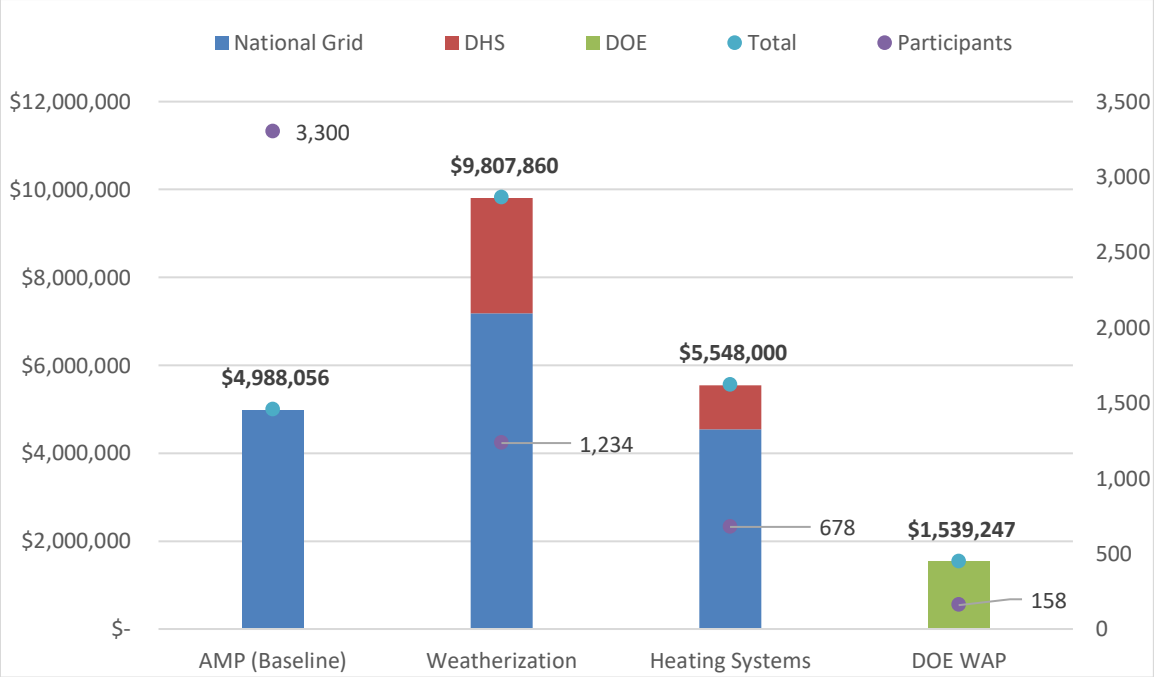


Table 2: Services Provided – IES Program and Low-Income Home Energy Assistance Program

Single-Family Income Eligible Services (IES) Program*	Low-Income Home Energy Assistance Program (LIHEAP)*

• Conduct whole house Energy Assessment and provide customer education
  ○ Lighting and Appliance (AMP) Assessment
  ○ Heating and Weatherization Assessment
• Review utility bills
• Replace incandescent and halogen bulbs with LED bulbs
• Install smart power strips and domestic hot water savings measures
• Talk with homeowner about opportunities to save energy and money through upgrading appliances and mechanical equipment and weatherizing the home.
• Coordinate the installation of weatherization measures and/or space/water heating system and air conditioning replacements if needed
• Install weatherization measures if needed
• Replace eligible appliances
• Conduct field inspections and testing, i.e., quality assurance/quality control.
	• Conduct whole house audit/ energy efficiency evaluation for Heating Systems and Weatherization (not appliances)
	• Install weatherization measures (insulation, air sealing, duct sealing)
	• Replace inefficient heating equipment if deemed eligible
	• Improve minor health and safety issues that are barriers to energy efficiency measures
	• Conduct field inspections and testing, i.e., quality assurance / quality control.

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

5. Residential New Construction (Electric and Gas)

Eligibility Criteria	The Residential New Construction (RNC) program is designed to advance the Rhode Island housing market toward Zero Energy homes. The program provides technical services, inspection services, and project incentives for new construction, additions, and major renovations to both one to four unit and five plus unit buildings. The program also supports major renovation of adaptive reuse projects (e.g. mill building conversions). The RNC program supports both market rate and income eligible housing units.

Offerings	**Design and Construction Assistance**
	• Energy modeling and design assistance to verify compliance with the RNC requirements and justify the respective incentives.
	• In-field training and inspections to verify compliance with the RNC requirements and promote efficiency in subsequent projects.
	Market Development
	• Technical training on high efficiency and Zero Energy building practices, as well as energy code compliance, to build necessary market capacities.
	• Training and certifying Home Energy Rating System (HERS) raters to increase the number of qualified raters based in RI.
	• Rating and certification services, including HERS, DOE Zero Energy Ready Home, Passive House, and ENERGY STAR, to promote visibility of energy efficiency in the marketplace and support increased use of the RI Residential Stretch Code.
	Incentives
	• Whole-home efficiency incentives for 1-50 unit buildings based on achieved level of efficiency and number of units.
	  ○ Path to Energy Efficiency incentives ranging from $200 to $4,000 per home.
	  Four efficiency tiers, with an entry threshold of 15% more efficient than baseline and progressive maximum air leakage requirements.
	  Additional incentive options of $250-$1,000 per home for all-electric home and $100-$200 per home for ENERGY STAR® certification.

	○ Path to Zero Energy Ready incentives ranging from $500-$1,500 per home in addition to Path to Energy Efficiency. Projects must meet a minimum base efficiency level, be all-electric, and achieve DOE Zero Energy Ready Home, Passive House, or equivalent certification. ○ Projects with >50 units are eligible for custom incentives. ○ Adaptive Reuse projects are incentivized based on a separate set of prescriptive measures tailored to mill conversion projects. • Certification incentives provided to support third-party verification of energy efficiency measures. • Equipment rebates for qualifying high efficiency heating, cooling, and hot water equipment. • Complimentary ENERGY STAR LED bulbs and WaterSense showerheads.
Implementation and Delivery	**Design and Construction Assistance, Incentives:** The RNC project pipeline is developed primarily through coordination with RI permitting departments, engagement of the building industry, and referrals from Energy*Wise* and Rhode Island Housing. A participating customer/project team begins the process by calling or emailing the RNC program. The project team meets with RNC staff to discuss the project design, learn how to modify design or mechanical systems to improve energy efficiency, and initiate energy modeling of the project to determine the potential for incentives. Once construction has begun, RNC staff provides on-site training as needed and conducts inspections of the completed project to determine energy efficiency and respective incentives. When the project is complete and has met program requirements, the performance and equipment incentives are issued. **Market Development:** RNC identifies opportunities to build necessary market capacities to advance toward Zero Energy Homes and delivers programming designed to achieve this goal.
Customer Feedback	A survey will be conducted annually to program participants and/or the broader market targeted by this program to collect feedback.

	Project teams are offered an opportunity to highlight their project in a case study for further promotions. Case studies have proven a good channel for customers to express satisfaction with the Program.
Changes for 2021	In 2021, the Company will **integrate the 2020 Zero Energy Pilot components into the primary delivery and incentive offerings** of the RNC program. Program **content related to codes and standards will be refreshed** to reflect the State's code update expected in early 2021.
Rationale for Changes	The RNC program has helped to drive market transformation, as demonstrated by a steady increase in the number of homes that achieve high levels of energy efficiency. Zero energy and passive house projects are no longer just for early adopters. The changes for 2021 will continue to increase the visibility and effectiveness of all electric homes and significantly improving thermal performance, both resulting in further reduction of energy use. These changes also contribute to advancing the State's greenhouse gas emissions reduction goals.
Proposed Upcoming Evaluations	Residential New Construction Baseline and Code Compliance Study (RI-21-RX-CSNC)
Notes	

Residential New Construction – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	18,088	979	66	116,554	1,544	417

Residential New Construction – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	85,272	4,445	675	323

6. Home Energy Reports (Electric and Gas)

Eligibility Criteria	The majority of Rhode Island residential Electric and Gas customers are eligible for the Home Energy Reports (HER) program. Customers with an email address on record will also receive an electronic version of the report (eHER). All customers have access to the online home energy assessment and related insights. Randomly compiled control and treatment groups are necessary for accurate savings reporting. Thus, some customers will not receive print or electronic reports (control group), while others receive both print and electronic HERs (treatment group). Based on the impact evaluation conducted in 2020, some treatment groups that have not shown appreciable savings will be removed from the portfolio resulting in program cost efficiencies.
Offerings	The HER program is a state-wide energy efficiency program that provides benefits for Rhode Island residential customers through the mailing of customer-specific energy usage reports and insights. While over 300,000 customers receive HERs (i.e., the treatment group) by way of direct mail and/or e-mail, all account holders have access to insight into their energy consumption via the web tools located on the National Grid website. The program has evolved since 2013 from offering only mailed insights to now being integrated into the Company's website with online assessment tools, sending Non-Advanced Metering Infrastructure (AMI) High Usage Alerts, and utilizing segmentation to target different populations with relevant messaging.
Implementation and Delivery	The program is administered by a Lead Vendor, a company with subject matter expertise selected by the Company to deliver the program. This Lead Vendor also 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, tracking data, managing the Web Portal, and documenting energy savings. The Lead Vendor works with the Company to craft the messaging and delivery of the HERs, and also works with the Company to introduce additional program enhancements, aligning with the Company's state-wide comprehensive marketing efforts. All eligible customers will receive a minimum of 6 print versions of the report a year and up to 4 gas specific reports in the winter season. All customers with email on record will receive up to 12 reports a year. The

	reports include marketing messages informing customers of other program opportunities so that they may be made aware of the most current and relevant energy efficiency offerings. For customers interested in learning more about energy saving tips and their home's energy consumption, they may log into the online portal and use the available tools.
Customer Feedback	The Company's Customer Energy Management team overseeing program strategy continues to work with the Customer Contact Center to ensure customer complaints are addressed. In each report there are multiple options for the customer to contact the Company to learn more or opt-out of the reports. In 2020, HERs were revised in response to customer feedback expressing that a customer's energy situation did not match that of their neighbor. In the fall of 2020, new neighborhood comparison groups will be calibrated for customers with solar systems. The Company is also looking to collect electric vehicle information to customize an offering for EV owners. The Lead Vendor completes a Customer Engagement Tracker (CET) annually to assess customer perception of the program. Additionally, a new user feedback module will be used in reports to solicit feedback from the customers on the usefulness of these reports. This will help to further evaluate how customer experience can be optimized for the best outcome.
Changes for 2021	The Company will **adopt 2020 evaluation recommendations to optimize savings**, potentially removing new mover cohorts from the program with historically lower energy savings over several years and increasing opportunities to collect email addresses so that eHERs are available and used by more customers. **HER 3.0 will be rolled out in 2021 with several enhancements** including new energy insights, new behavioral techniques, and increased "moments of pride" to encourage behavior modification and engagement. HERs will continue to support solar-specific neighbor comparisons introduced in late 2020. The Company will use this as an opportunity to promote battery storage and ConnectedSolutions to solar customers.
Rationale for Changes	The current HER has been used since the program first rolled out in 2013. HER 3.0 will encourage continued customer engagement, better customization, and faster transitions to other program opportunities to drive comprehensive adoption of energy efficiency solutions while encouraging passive demand reduction through behavior change.

Proposed Upcoming Evaluations	None are planned for 2021 as the program recently completed an impact evaluation in 2020.
Notes	

Home Energy Reports – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	26,852	26,852	3,692	91,619	2,642	323,248

Home Energy Reports – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	93,548	93,548	451	152,324

7. ENERGY STAR® Lighting (Electric)

Eligibility Criteria	ENERGY STAR Lighting serves all residential customers in Rhode Island. Special areas of focus are food banks, schools, and designated hard to reach areas.
Offerings	ENERGY STAR® Lighting reduces the cost of energy efficient lighting to all residential RI customers. Pricing of efficient lighting is automatically discounted at the retail level to facilitate the consumer transaction. Any ENERGY STAR qualified lighting product can apply for an incentive through this program. 2021 product offerings include standard LED bulbs, specialty bulbs, fixtures, and linear LEDs.
Implementation and Delivery	ENERGY STAR Lighting products are promoted in retail stores, offered at no cost in RI food banks (two bulbs per customer with a pamphlet indicating other income eligible energy efficiency services), at RI schools as a fundraising activity along with an educational energy efficiency orientation, online through the National Grid marketplace at ngrid.com/shop, and through a pop-up retailer that brings lighting sale opportunities to non-traditional retail locations. The Program brings down LED lighting products pricing through a negotiated cooperative promotion (NCP) process. The NCPs require manufacturers and retailers to work together and present proposals for products and quantities that will be sold for either short promotional periods or for the calendar year. Customers pay the final incentivized price and are not required to apply external coupons or rebates. The Lead Vendor organizes the NCPs and conducts retailer support and training through in-store visits, online training, and customer outreach events. A rebate processor manages tracking of sales and incentives to the parties entered in the NCP. A pop-up retailer works with businesses and provides staff for special events where lighting and product sales can be offered. Finally, there is a vendor that manages National Grid's online marketplace where customers receive instant incentives and the convenience of online shopping. National Grid will continue to offer short term flash sales of specially priced products to customers throughout the year on the marketplace. In addition to working with the RI food banks, there is a focus on hard-to-reach areas defined by the following criteria: • Income Level: 60% - 120% of the state's median income • Primary Language: Non-English • Ethnicity: Non-Caucasian, Ethnic Minorities • Education Level: Below 4-year college degree

Customer Feedback	Much of the customer feedback for this program comes from our Lead Vendor as they work with retailers and staff customer educational events at the retail locations and through the pop-ups. In general, Lead Vendors report customers are pleased with the quality of lighting produced from LEDs. One initial concern was a desire to purchase lighting with a similar color as incandescent lighting. The pop-up retailer offers both bright white and daylight options at all events, and retailers now carry a range of color options. In 2020, the National Grid marketplace had an average Net Promoter Score of 77, which is considered world-class. The Net Promoter Score is a measurement of customer experience, in this case based on a customer's likelihood of recommending the National Grid Marketplace to a friend or colleague.
Changes for 2021	In 2021, the Company will **continue to support lighting products with the exception of reflectors**, which have been widely adopted according to recent evaluation studies. However, the **incentives will be lower for select products** including standard LED bulbs, specialty bulbs, reflectors, fixtures, and linear LEDs.
Rationale for Changes	ENERGY STAR® Lighting reduces the cost of energy efficient lighting to all residential RI customers and provides immediate savings to customers with nominal customer investment. Because of the effective transformation of the lighting market in Rhode Island, the Company, supported by the findings of the Market Potential Study, have reduced the number of eligible bulbs and bulb types in order to target the savings that remain in the lighting market amidst this successful transformation.
Proposed Upcoming Evaluations	None planned for 2021. Completed shelf stocking survey and sales data report in 2020.
Notes	

ENERGY STAR® Lighting – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	26,801	11,533	1,872	46,854	5,275	68,164

8. Residential Consumer Products (Electric)

Eligibility Criteria	Residential Consumer Products serves all residential customers by offering incentives on electronics, ENERGY STAR® consumer appliances, and other high use energy saving devices.
Offerings	Residential Consumer Products incorporates both the federal Environmental Protection Agency (EPA) ENERGY STAR and Department of Energy (DOE) categories of consumer appliances, select building products, and some energy saving items not included by the federal agencies. The largest savings elements of the Consumer Products program comes from recycling older refrigerators and freezers and the sale of new advanced power strips that assist in removing the standby power load from devices that are plugged into wall sockets. In 2021 the program will also support dehumidifiers, dehumidifier recycling, dryers, refrigerator and freezer recycling, room air cleaners, room air conditioners, efficient shower heads, pool pumps, and low-emissivity storm windows. Consumers can purchase products at a local retailer, online through any online retailer as long as the product meets product specifications and there is a receipt, or at the National Grid marketplace (ngrid.com/shop).
Implementation and Delivery	Similar to the ENERGY STAR Lighting program, there is a Lead Vendor for this program that works with retailers, so they are knowledgeable about the products and ensure proper signage within the stores. The Lead Vendor also jointly provides staff at customer outreach events at retailer locations. The program supports a combination of upstream and midstream incentives as well as post-purchase consumer incentives. The upstream and midstream incentives encourage retailers and manufacturers to support ENERGY STAR with increased production and availability of products. Consumer incentives are designed to bring efficient product costs in line with less efficient equipment, thereby encouraging the adoption of the more efficient item. A rebate processing vendor verifies and processes post-consumer incentives which can be submitted electronically or by traditional mail. This vendor also processes upstream and midstream incentives.
Customer Feedback	Much of the customer feedback for this program comes from our Lead Vendor, as they work with retailers and staff customer educational events at the retail location and through the pop-ups. Lead Vendors report general customer interest in learning which products have incentives.

Changes for 2021	The Company will **assess the cost effectiveness of joining the ENERGY STAR Retail Products Platform (ESRPP) in 2021 and join if cost effective**. ESRPP is a midstream initiative of energy efficiency program sponsors, retailers, and other key ENERGY STAR program partners and stakeholders. ESRPP aims to transform markets by streamlining and harmonizing energy efficiency programs with retailers, making them less complex and more cost-effective. The program reviewed the ESRPP in 2018, at which time there were limited products yielding savings opportunities for RI, with the cost of data reporting exceeding the benefits. The minimum cost of entry was greater than possible savings. Since then, more products have been added to the ESRPP, which may improve the savings and economics of this offering. Relatedly, the recent Market Potential Study identified products such as clothes washers and refrigerators, which are not currently offered by the program. These products were removed from the program in prior years, as high free ridership values meant they were not cost effective. The ESRPP offers an opportunity to reduce costs from a traditional downstream approach and perhaps once again include these offers in the program. In 2021, the program will **develop a baseline of renter information and participation**, collecting whether customers are renters on customer mail-in or online rebates. Rental reporting contributes to equity insights, as renters are a customer demographic that stakeholders have expressed an interest in prioritizing the assurance of equitable delivery of service to. However, a consequence of adopting the ESRPP would be a loss of renter insights from the midstream approach. The consumer products program will **collaborate with the Multifamily Residential Program and Public Housing Authorities on cooling opportunities for income eligible customers.** The multifamily vendor will assist housing authorities with bulk application of rebates and purchasing of new window air conditioners to streamline energy efficiency offerings for the customer.
Rationale for Changes	**ESRPP:** The ESRPP would allow the program to include more products within the program portfolio, provide incentives to more customers, potentially allow the program to reduce incentive costs, and increase savings, thus exploration of joining the platform is warranted. **Renter Information/Participation:** Developing a baseline on renter participation will allow for improved insights into equitable participation in

	the energy efficiency programs, as renters are a customer demographic that stakeholders have expressed an interest in prioritizing the assurance of equitable delivery of service to. **Multifamily Program Collaboration:** Working in conjunction with the multifamily residential program to facilitate cooling opportunities through Public Housing Authorities is one way to streamline energy efficiency offerings for the customer. The Company reviewed multiple options to support Public Housing Authorities, selecting the most cost-effective solutions first while including other options for residents that had varying needs and requirements.
Proposed Upcoming Evaluations	The refrigerator and freezer recycling savings will be evaluated in 2021.
Notes	

Residential Consumer Products – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	38,130	5,926	1,019	133,476	2,681	33,111

9. Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC) (Electric and Gas)

Eligibility Criteria	Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC) serves all residential customers by offering incentives on high-efficiency equipment, and equipment maintenance. Energy efficient equipment must be installed by a licensed heating contractor or plumber.

Offerings	The High-Efficiency Heating, Ventilation, Air Conditioning and Hot Water Programs (HVAC Programs) promote and incentivize the installation of high efficiency electric and gas equipment through:
	• Customer rebates on energy efficient equipment
	  ○ Boilers
	  ○ Combined condensing boiler with on-demand water heating unit
	  ○ Furnaces
	  ○ Heat recovery ventilators
	  ○ Air source heat pumps (space and water heating)
	  ○ Air Conditioners
	  ○ Hot water heaters
	  ○ Smart thermostats
	  Ability to enroll in the Demand Response program for additional energy savings
	• Quality Installation Verification
	• Contractor training
	• Contractor incentives
	• Upstream incentives (discount taken at the distributor level)
	
	Customers who complete a Home Energy Assessment through the Energy*Wise* Program can apply for 0% Heat Loan financing for qualified high-efficiency space heating and cooling and hot water equipment upgrades.
	
	The HVAC Electric and Gas Program is cross-promoted through the Energy*Wise* Home Energy Assessment, Multifamily, Community and Home Energy Reports Programs. Training elements and best practices of the program are also provided to the Income Eligible Services Program to maintain consistency in the sizing, design, installation and performance of the high efficiency systems.

Implementation and Delivery	The program is administered by a Lead Vendor that is responsible for contractor training, maintaining distributor relationships, tracking data, providing content for marketing and documenting monthly, quarterly and annual energy savings. The Lead Vendor works closely with the Company to deliver the HVAC Program and provide strategic insight for program improvements. Contractor training and education is a primary component of the program to ensure accurate sizing, design, installation and verification of heating, cooling, and hot water equipment and results in energy savings and customer satisfaction. The Lead Vendor provides regular communication and in-store time with distributors to provide training and information on the equipment and gain feedback on customer interactions. The Lead Vendor also ensures distributors have proper promotions and marketing signage within the distribution stores. The Company and Lead Vendor work with manufacturers to develop special offers, or "flash sales", if production numbers are low. Product channels for ease of customer use and for product adoption: • Customers are informed of the HVAC program when they participate in the Energy*Wise* single family or multifamily Home Energy Assessment Program; through HVAC contractors during routine maintenance or emergency services or their regular marketing communications; or through Residential New Construction energy advisors during project design consultation. In addition, customers receive marketing information through various National Grid Energy Efficiency channels including marketing emails, Home Energy Reports, bill inserts and radio and media advertisements. The RI Online Marketplace at https://ri.home.marketplace.nationalgridus.com offers customers the ability to purchase instant discount rebates on energy efficient equipment through National Grid's website. • The program supports a combination of upstream and midstream incentives as well as post purchase consumer incentives. The upstream and midstream incentives encourage retailers and manufacturers to support ENERGY STAR with increased production and availability of products. Consumer incentives are designed to

	bring efficient product costs in line with less efficient equipment, thereby encouraging the adoption of the more efficient item. • Implement a customer optimization strategy to identify electric resistance heated homes where air source heat pumps would be an ideal solution. A rebate processing vendor verifies and processes post-consumer incentives which can be submitted electronically or by traditional mail. This vendor also processes upstream and midstream incentives.
Customer Feedback	The Company's HVAC quality assurance (QA)/quality control (QC) staff meet with every customer when they perform an onsite inspection and ask them for feedback or questions. Staff often have extended discussions with customers about their new system and how to best operate and maintain it for optimal performance. The QA/QC staff also frequently meet with HVAC service technicians and installation crews on project sites. The purposes of these visits are to perform QA/QC inspections, test the equipment and installation, capture customer feedback, and provide additional 1:1 training. The QA/QC staff frequently meet with HVAC distributors at their distribution centers to share new program information and provide feedback from contractors, customers, and the utility program administrators. Finally, these same staff lead larger HVAC contractor trainings and annual contractor meetings where the lessons learned from field visits are shared. The program's central focus is on these frequent direct interactions with customers, contractors, and distributors to obtain feedback and share lessons learned from the field, while mentoring and training HVAC service providers.
Changes for 2021	The HVAC Program will **develop a lead generation process** in conjunction with the Energy*Wise* Program. The Energy*Wise* Lead Vendor will provide regular reports with customer information with respective HVAC recommendations as a way to create lead generation for the HVAC Lead Vendor. The Company will also work with HVAC contractors to educate them around how to further promote incentives to customers. In 2021, the Company will **develop HVAC equipment rebate bundles**. Examples of bundles could include a boiler/furnace + WiFi thermostat or weatherization + heating and/or cooling system.

	Through **enhanced and targeted marketing**, the Company will target relevant electric customers with messaging encouraging them to convert to heat pumps. **Develop a comprehensive program to increase participation in energy efficiency**, including training, marketing and approved contractor list. Through the HVAC Contractor taskforce, **develop strategies for increasing energy efficiency participation.**
Rationale for Changes	**Collaborative lead generation and incentive promotion:** The Energy*Wise* Program generates heating, cooling, and hot water system replacement recommendations during the Home Energy Assessment service. It is then up to the customer to proceed with equipment replacement. Providing a list of HVAC system recommendations to the HVAC Lead Vendor will create a strategic communication and technical support channel to assist customers to move forward with the HVAC system recommendations. **HVAC equipment rebate bundles:** Bundled incentives are expected to help customers to make decisions to move forward with system upgrades, and to do comprehensive upgrades at one time. **Targeted Marketing:** Optimizing marketing efforts will aim to provide customer awareness of the EE incentives near the time when they may need to replace their equipment. **Increased participation:** Training contractors with technical training as well as comprehensive EE Program training will qualify them for an approved contractor list. Intention is to incentivize contractors to offer EE equipment at all times in order to help increase customer participation.
Proposed Upcoming Evaluations	RI-21-RG-GasHPDemo – Gas Heat Pump Demonstration Evaluation. This study will assess the savings potential for a possible new measure offering, gas heat pumps. The savings will be used to determine if the measure is cost effective. Furthermore, the study will review and determine if this technology is market ready and should be considered as a measure to be included as a full program offering. Some key questions will be how efficient these units work at different temperatures, if they perform close to their rated efficiency, and whether they can be a home's sole heating source.
Notes	

High-Efficiency Heating, Cooling and Hot Water – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	51,309	3,181	204	239,549	3,488	5,022

High-Efficiency Heating, Cooling and Hot Water – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	667,485	38,345	3,673	4,348

10. Residential ConnectedSolutions

Eligibility Criteria	ConnectedSolutions is National Grid's active demand reduction program that focuses on electric demand reduction during peak demand periods during the year. Consumers with eligible controllable equipment can enroll to participate in active demand reduction.
Offerings	**Thermostats** The Company has offered a Smart thermostat-based demand response program since the summer of 2016. There are nine different smart thermostat manufacturers supported in the program. This program precools the customers' home before the grid peak and then sets back the thermostat setting during peak periods. This lowers the chance of customers' central air conditioning units running during grid peaks. A customer may opt out of the program or events at any time. Customers receive an initial enrollment incentive and an annual incentive for staying in the program. **Batteries** The Company has offered a battery-enabled demand response program since 2019. There are four different smart inverter manufacturers supported in the program. The Company hopes to add two more inverter manufacturers before the end of 2020. The inverters control the battery systems. This program sets batteries to discharge during grid peaks. Often, this means that power is being exported to the grid during peak times, which reduces the load on the grid. This export is now supported in both the Net Metering and RE-Growth programs. Customers may apply for a seven-year, 0% interest Heat Loan for the cost of the battery system. Customers receive no other upfront incentives. Customers are incentivized based on the average performance (kW) of their battery system over the 30 to 60 summer events each year. **Electric Vehicles** Starting in 2021, the Company will offer an electric vehicle (EV) based demand response program. This program will use the on-board telematics included in virtually all new EV and PHEV (plug-in hybrid electric vehicles) to automatically stop vehicles from charging when the electric grid is at or

	near its annual peak. These peak events will be called on the same dates and times as the battery-based demand response program. Customers will receive an enrollment incentive for joining the program, and a participation incentive for each event they participate in. The participation incentive for customers using level 2 charging (typically 5kW power draw) will be higher than customers using level 1 charging (typically 1.4 kW power draw). The purpose of this measure, as with all electric demand response measures, is to cost-effectively reduce peak electric load on the grid. The Company's Off-Peak Charging Rebate Pilot, which pays customers an incentive for charging their vehicles at night, aims to understand customer responsiveness to time-differentiated price signals. The Company's Off-Peak Charging Rebate Pilot is set to end in 2021. The Company will run both programs concurrently in 2021 without negatively effecting either program. Customers in the Off-Peak Charging Rebate Pilot will not be eligible to participate in the EV Demand Response program. The EV Demand Response program will not open for enrollments until 2021, at which point the Off-Peak Charging Rebate Pilot will not be accepting new enrollments. In designing the EV demand response program, the Company applied lessons learned from the Company's Off-Peak Charging Rebate Pilot, including the need to focus incentives and participation on peak days and times, and the need to make the participation incentive dependent on a grid benefit (the stopping of EV charging at peak times) to prevent free-ridership.
Implementation and Delivery	**Thermostats** In this BYOD (Bring-Your-Own-Device) program, customers are free to purchase a thermostat from any of the nine supported manufacturers. After purchase, thermostat manufacturers send emails and in-app notifications to customers inviting them to enroll in the ConnectedSolutions program. Enrollments in smart thermostat-based demand response options have historically exceeded expectations. In 2019, the program planned to enroll 2,479 thermostats, but enrolled 3,936. This overachievement was largely the result of a coordinated marketing effort with the largest thermostat vendor, enrolling their existing customers. In 2021, the program plans for an enrollment increase of 42% and the Company develops new initiatives to further increase enrollments. This includes integrating the demand response incentive into the National Grid marketplace and integrating

enrollment in ConnectedSolutions into the setup process for some thermostats.

Number of Thermo-stats	Historic Numbers					Proposed Number
	2016	2017	2018	2019	2020	2021
	96	813	1,674	3,936 (vs. 2,479 planned)	4,526 (15% increase)	6,409 (42% increase)

Batteries

In this BYOD program, customers are free to purchase an inverter from any of the four supported inverter manufacturers and have it installed by the customer's preferred installer. Inverters control the battery systems. Enrollments in the residential battery-enabled demand response program have been lower than expected. This is the result of several factors including longer than expected negotiations with additional inverter manufacturers and the reluctance of some inverter manufacturers and installers to invest in the program until the demonstration finished in the Company's Massachusetts service area. On July 28, 2020, Massachusetts regulators approved an identical program for full implementation. Despite these challenges, the Company observes increased interest in this program from inverter manufacturers, installers, and customers and projects a 1.2 times increase in enrollments for 2021, or 300 batteries.

Number of Batteries	Historic Numbers		Proposed Number
	2019	2020	2021
	24 (vs. 50 planned)	100 (4.12x increase)	300 (3x increase)

Electric Vehicles Demonstration

The EV-based demand response measure will be new in 2021. In this BYOD program, customers will receive emails and/or in-app notifications from their automobile manufacturer after the purchase of their EV inviting them

	to enroll in ConnectedSolutions. The Company has set the goal of enrolling 145 vehicles into the program in the first year. As with other demand response measures, marketing will be a coordinated effort between the Company and the device manufacturers, in this case auto manufacturers.
Customer Feedback	Feedback from customers and vendors is used to continuously improve all of the Company's programs. This is especially important for new measures such as the EV-enabled demand response measure.
Changes for 2021	In 2021, the Company will **offer an electric vehicle-based demand response program** to demonstrate cost-effective peak load reduction from EVs for the first time. The goal is to enroll 280 vehicles into the program in the first year. Additional detail about this new offering is described in Offerings above. In 2021, the program will **develop new initiatives to increase enrollment in smart thermostat-based demand response**. This includes integrating the demand response incentive into the National Grid marketplace and integrating enrollment in ConnectedSolutions into the setup process for qualifying thermostats.
Rationale for Changes	Rhode Island is seeing an increase in the adoption of electric vehicles. Although most EV charging does not happen during peak times, there is still an opportunity to cost-effectively further decrease the peak loads from EV charging.
Proposed Upcoming Evaluations	The Company will conduct a third-party evaluation of the Electric Vehicle Demonstration in 2021, in conjunction with an identical program and evaluation in the Company's Massachusetts service area.
Notes	The program is planning to achieve demand reductions above the set Targets for Active demand response (i.e. the maximum scenario in the Market Potential Study).

Residential Connected Solutions – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Active Demand Reduction kW (Electric)	Budget ($000)	Participation
Electric	0	0	5,739	1,960	4,178

11. Marketing, Outreach & Education

11.1 Overview

The goals of the Company's marketing efforts are to build awareness of and drive participation in the Company's efficiency offerings and services, while providing a positive customer experience. The Company uses an integrated, multichannel approach featuring consistent messaging and visual design elements (as appropriate) across communications. General awareness tactics (i.e. print ads and radio) as well as digital and direct one-to-one tactics (such as e-mail, online banner ads, social media, and direct mail) generate customer interest and program participation. All ratepayers receive bill inserts and quarterly 'We Connect' printed newsletters and can access www.nationalgridus.com at any time (provided they have internet access). Face-to-face interactions at events provide an opportunity to educate customers at a personal level.

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 on www.need.org, as well as training to students and teachers in grades K-12.

11.2 Delivery and 2020 Successes

Familiarity of energy efficiency programs among RI customers remained strong and stable with respect to 2019 levels, per the Company's monthly online survey of a representative sample of National Grid customers. 65.9% of the customers surveyed between April 2019 and June 2019 were "very familiar" or "somewhat familiar" with "energy savings or rebate programs from National Grid that help you with ways to use less gas or electricity." Other response options include "not very familiar," "not at all familiar," and "not sure."

National Grid uses a multichannel marketing approach to generate interest and drive adoption of solutions across the portfolio, as well the use of residential segmentation to enable personalization and optimize a channel strategy based on customers' preferred communication channels. The Company continued to align marketing efforts with residential customer research, customer segmentation, propensity modeling, media habits research, and behavior data. Due to COVID-19 pandemic, initial marketing plans were adjusted and new campaigns were developed to reflect changes to energy efficiency programs, strategies to engage customers during this time, and customer communications.

New campaign launches included the virtual home energy assessment and contactless fridge recycling pickups. While marketing for point of sale programs paused and then resumed per state reopening guidelines, National Grid continued to help customers save energy and money during these challenging times with enhanced online product sale offers through vendors and the Company's ecommerce Marketplace at www.ngrid.com/shop. Additionally, The National Grid website, www.ngrid.com/save, remained an important resource for information on products and services as well as rebates available to customers. As part of an augmented ongoing communication strategy during the COVID-19 pandemic

designed to help customers with their bills, National Grid embedded seasonal energy efficiency tips and videos, which linked to websites to learn more about energy saving programs. A new portfolio level awareness campaign will be launched in the fall of 2020 to support education and value of energy efficiency, along with simple and easy steps customers can take.

Messaging continued to focus on the benefits of energy efficiency products and programs while aligning with overall Company communications and demonstrating an understanding of current customer sentiment and needs based on internal research. Given customer concerns regarding finances, core to our messaging was helping customers save energy and money while spending more time at home and potentially using more energy. Where appropriate, messaging around safety was incorporated into marketing materials given health and safety concerns. Overall message tone was helpful, empathetic, and informative to ensure the Company reflected our role as a trusted advisor who truly cares about customers' needs.

Due to the pandemic, the annual Rhode Island Home Show – a key residential customer event in which National Grid participates and sponsors the Energy Expo – was cancelled and will be re-evaluated for 2021. National Grid will continue to support these efforts in future years and look at new ways to engage RI residential customers safely through online and virtual formats in the current environment.

12. 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.

Table 3. Electric Programs

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
EnergyWise Single Family	Air Sealing Kit - Electric	10	Average Incentive based on measure mix and is applied per participant (see line below)		
	Air Sealing Kit - Oil	25			
	Air Sealing Kit - Others	10			
	Pipe Insulation - Electric	385			
	Pipe Insulation - Oil	3,300			
	Pipe Insulation - Others	110			
	Pre-Wx	591			
	Wx - OIL	1,870			
	Wx Elec - Elec Heat only	220			
	AERATOR - Electric	40			
	AERATOR - Oil	10			
	AERATOR - Others	10			
	Showerhead - Electric	26			
	Showerhead - Oil	176			
	Showerhead - Others	17			
	Programmable thermostat - Electric	750			
	Programmable thermostat - Oil	2,500			
	Programmable thermostat - Other	100			
	Wifi thermostat - Electric	11			
	Wifi thermostat - Oil	330			
	Wifi thermostat - Others	55			
	LED Bulbs	78,540			
	LED Bulbs (EISA Exempt)	4,620			
	LED Bulbs Reflectors	9,240			
	LED Indoor Fixture	600			
	LED Outdoor Fixture	6			
	Smart Strip	12,000			
	Refrigerator Brush	9,900			
	Participant	11,750	$1,142	$13,422,222	
	Heat Loans			$1,350,000	
	Program Planning & Administration				$381,819
	Marketing				$406,513
	Sales, Technical Assistance & Training				$1,247,392
	Evaluation & Market Research				$225,394

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Multifamily	Custom	25	Average Incentive based on measure mix and is applied per participant (see line below)		
	AIR SEALING ELEC WITH AC	1,400			
	AIR SEALING OIL	10			
	INSULATION ELEC WITH AC	1,800			
	INSULATION OIL	200			
	AERATOR	300			
	AERATOR Oil	50			
	Pipe Wrap DHW Elec	225			
	SHOWERHEAD Elec	100			
	SHOWERHEAD Oil	10			
	TSV Showerhead Elec	65			
	TSV Showerhead Oil	10			
	THERMOSTAT Elec with AC	1,200			
	THERMOSTAT OIL	20			
	Common Ext LED Bulbs	597			
	Common Ext LED Fixture	264			
	Common Ext Reflector	53			
	Common Int EISA Exempt	23			
	Common Int LED Bulbs	1,370			
	Common Int LED Fixture	860			
	Common Int Reflector	44			
	Dwelling Ext LED Fixture	52			
	Dwelling Ext Reflector	46			
	Dwelling Int EISA Exempt	689			
	Dwelling Int LED Bulbs	2,511			
	Dwelling Int Reflector	918			
	Smart Strip	1,000			
	Refrig rebate	25			
	Vending Miser	5			
	Participant	4,000	$608	$2,432,000	
	Heat Loans			$50,000	
	Program Planning & Administration				$88,750
	Marketing				$48,029
	Sales, Technical Assistance & Training				$406,591
	Evaluation & Market Research				$31,466

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Residential New Construction	Adaptive Reuse	110	Average Incentive based on measure mix and is applied per participant (see line below)		
	CODES AND STANDARDS	1			
	Renovation Rehab CP	5			
	Renovation Rehab Tier 1 Home	20			
	Renovation Rehab Tier 2 Home	15			
	Renovation Rehab Tier 3 Home	4			
	Tier 4 Home	15			
	CWASHER	111			
	DISHWASH	480			
	SHOWERHEAD	20			
	LED Bulbs	8,129			
	Refrig rebate	554			
	CP Home - Heating	2			
	CP Home - Cooling	2			
	CP Home - Water Heating	2			
	Tier 1 Home - Heating	75			
	Tier 1 Home - Cooling	75			
	Tier 1 Home - Water Heating	75			
	Tier 2 Home - Heating	90			
	Tier 2 Home - Cooling	90			
	Tier 2 Home - Water Heating	90			
	Tier 3 Home - Heating	80			
	Tier 3 Home - Cooling	80			
	Tier 3 Home - Water Heating	80			
	Participants	417	$1,995	$831,825	
	Program Planning & Administration				$64,488
	Marketing				$24,014
	Sales, Technical Assistance & Training				$458,631
	Evaluation & Market Research				$165,377
Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC)	ACQIVES	15	$175	$2,625	
	ACS16SEER13EER	165	$50	$8,250	
	Central Heat Pump	49	$350	$17,150	
	DOWNSIZE	44	$250	$11,000	
	ECM Pumps	6,105	$100	$610,500	
	Elec Res to MSHP	186	$3,230	$600,000	
	HP Mini-split QIV	485	$175	$84,875	
	HPQIVES	26	$175	$4,550	
	HPTUNE	11	$175	$1,925	
	HPWH < 55 gallon UEF 2.7	450	$600	$270,000	
	HPWH >=55 gallon UEF 2.0	11	$150	$1,650	
	Mini-Split Heat Pump	1,805	$350	$631,750	
	WiFi Tstat-cool only,Elec	132	$75	$9,900	
	WiFi Tstat-heat and cool,Gas	1,320	$75	$99,000	
	HVAC Financing			$231,300	
	Program Planning & Administration				$83,811
	Marketing				$278,321
	Sales, Technical Assistance & Training				$480,271
	Evaluation & Market Research				$60,921

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Residential Consumer Products (ENERGY STAR® Products)	Energy Star ProductsThermostatic Shutoff Valve, Elec	20	$11	$220	
	Energy Star ProductsThermostatic Shutoff Valve, Oil	5	$11	$55	
	Energy Star ProductsThermostatic Shutoff Valve, Other	5	$11	$55	
	Energy Star ProductsLowFlow Showerhead with TSV, Electric	88	$15	$1,320	
	Energy Star ProductsLowFlow Showerhead with TSV, Other	25	$15	$375	
	Energy Star ProductsRoom Air Conditioner 10.8	800	$40	$32,000	
	ES Storm Windows	105	$25	$2,625	
	ES Storm Windows Elec heating	105	$25	$2,625	
	ES Storm Windows Others	105	$25	$2,625	
	Energy Star ProductsDehumidifier Rebate	2,000	$30	$60,000	
	Energy Star ProductsDehumidifier Recycling	450	$30	$13,500	
	Energy Star ProductsEnergy Star Dryer	950	$50	$47,500	
	Energy Star ProductsPool Pump variable	500	$500	$250,000	
	Energy Star ProductsRoom Air Cleaners	395	$40	$15,800	
	Energy Star ProductsSmart Strip	11,250	$10	$112,500	
	Energy Star ProductsTier 2 APS	8,750	$35	$306,250	
	Energy Star ProductsTier 2 APS OS	7,500	$35	$262,500	
	Energy Star ProductsFreezer Recycling	325	$85	$27,625	
	Energy Star ProductsREFRIG RECYCLING	4,100	$85	$348,500	
	Program Planning & Administration				$71,767
	Marketing				$531,536
	Sales, Technical Assistance & Training				$542,513
	Evaluation & Market Research				$49,345
ENERGY STAR® Lighting	LED Bulb	242,500	$1.80	$436,500	
	LED Bulb (Fixture)	231,500	$6.75	$1,562,625	
	LED Bulb (Food Pantries)	80,000	$3.75	$300,000	
	LED Bulb (Hard to Reach)	240,000	$2.63	$631,200	
	LED Bulb (Linear LED)	93,550	$9.00	$841,950	
	LED Bulb (School Fundraiser)	4,250	$3.75	$15,938	
	LED Bulb (Specialty)	105,500	$2.55	$269,025	
	Program Planning & Administration				$237,648
	Marketing				$560,399
	Sales, Technical Assistance & Training				$231,630
	Evaluation & Market Research				$187,838
Home Energy Reports	New Mover electric	18,428			
	New movers dual fuel	10,342			
	Optout dual fuel	123,401			
	OptOut electric	171,077			
	Program Planning & Administration				$44,801
	Marketing				$10,469
	Sales, Technical Assistance & Training				$2,550,803
	Evaluation & Market Research				$35,608

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Income Eligible Single Family	AMPEDUC TLC	3,630	$180	$653,400	
	AMPWx DelFuel	581	$5,000	$2,904,000	
	AMPWx Elec	36	$5,000	$181,500	
	AMPDHWELEC	20	$10	$200	
	AMPDHWGAS	20	$10	$200	
	AMPDHWOIL	20	$10	$200	
	AMPWATERBED	2	$650	$1,300	
	Early Retirement CW Elec DHW & Elec Dryer	109	$700	$76,137	
	Early Retirement CW Elec DHW & Gas Dryer	346	$700	$241,945	
	AMPACREPLACE	1,900	$350	$665,000	
	AMPHEATSYSTEM	436	$5,000	$2,178,000	
	AMPMinisplit Heat Pumps Electric Resistance	50	$15,000	$750,000	
	AMPProgrammable Thermostat, Gas	25	$125	$3,125	
	AMPProgrammable Thermostat, Oil	25	$125	$3,125	
	AMPProgrammable Thermostat, Other	25	$125	$3,125	
	AMPTHERMOSTAT, Electric	25	$125	$3,125	
	AMPLED Bulbs	47,190	$9	$401,115	
	AMPAPREMOV	7	$51	$337	
	AMPDehumidifier Rebate	634	$250	$158,400	
	AMPSmart Strip	4,356	$20	$87,120	
	Early Retirement CW Gas DHW & Elec Dryer	5	$700	$3,384	
	Early Retirement CW Gas DHW & Gas Dryer	232	$700	$162,425	
	Early Retirement CW Oil DHW & Elec Dryer	137	$700	$95,876	
	Early Retirement CW Propane DHW & Elec Dryer	9	$700	$6,204	
	AMPFREEZER	250	$550	$137,500	
	AMPRefrig rebate	1,891	$1,050	$1,985,156	
	Program Planning & Administration				$317,061
	Marketing				$141,044
	Sales, Technical Assistance & Training				$2,126,183
	Evaluation & Market Research				$152,080

Electric Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Income Eligible Multifamily Retrofit	Participant (NEB)	4,800	Average Incentive based on measure mix and is applied per participant (see line below)		
	Custom	59			
	AIR SEALING ELEC WITH AC	100			
	AIR SEALING OIL	100			
	INSULATION ELEC WITH AC	100			
	INSULATION OIL	100			
	AERATOR Elec	100			
	AERATOR Oil	100			
	SHOWERHEAD Elec	100			
	SHOWERHEAD Oil	100			
	TSV Showerhead Elec	100			
	THERMOSTAT Elec with AC	200			
	THERMOSTAT OIL	50			
	Common Ext LED Bulbs	136			
	Common Ext LED Fixture	136			
	Common Ext Reflector	5			
	Common Int LED Bulbs	136			
	Common Int LED Fixture	782			
	Common Int Reflector	10			
	Dwelling Ext Reflector	10			
	Dwelling Int EISA Exempt	25			
	Dwelling Int LED Bulbs	340			
	Dwelling Int Reflector	10			
	Smart Strip	200			
	Refrig rebate	50			
	Vending Miser	4			
	Participants	5,000	$849	$4,243,200	
	Program Planning & Administration				$116,223
	Marketing				$9,890
	Sales, Technical Assistance & Training				$406,335
	Evaluation & Market Research				$55,152
Residential ConnectedSolutions	Thermostats New	1,479	$45	$66,555	
	Thermostats Existing	4,930	$20	$98,600	
	Battery Daily (number of unit)	300	$2,200	$660,000	
	Evs Peak (customers) New	145	$73	$10,585	
	Program Planning & Administration				$37,224
	Marketing				$12,674
	Sales, Technical Assistance & Training				$350,659
	Evaluation & Market Research				$190,000

Table 4. Natural Gas Programs

Gas Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC)	BOILER RESET	33	$225	$7,425	
	Boiler90	65	$450	$29,250	
	Boiler95	358	$1,000	$357,500	
	COMBO CONDENSING	35	$600	$21,000	
	COMBO CONDENSING 95	1,430	$1,200	$1,716,000	
	ENERGY STAR COND WATER HEATER 0.80 UEF	5	$250	$1,250	
	Furnace95ECM	390	$500	$195,000	
	Furnace97ECM	70	$600	$42,000	
	HEAT RECOVERY VENT	22	$500	$11,000	
	ENERGY STAR STORAGE WATER HEATER .64 UEF (med draw)	44	$100	$4,400	
	ENERGY STAR STORAGE WATER HEATER .68 UEF (high draw)	50	$100	$4,950	
	ENERGY STAR ON DEMAND WATER HEATER 0.87 UEF	320	$600	$192,000	
	LOW_FLOW_SHOWERHEAD	250	$7	$1,625	
	TSV	15	$12	$173	
	TSV_SHOWERHEAD	185	$15	$2,775	
	WiFi Thermostat cooling and htg	510	$75	$38,250	
	WiFi Thermostat gas ht only	3,025	$75	$226,875	
	Programmable Thermostat	440	$25	$11,000	
	Combo Furnace	15	$700	$10,500	
	Water Heater, Indirect, Gas	150	$400	$60,000	
	Program Planning & Administration				$142,292
	Marketing				$213,843
	Sales, Technical Assistance & Training				$167,326
	Evaluation & Market Research				$136,614
EnergyWise	Aerator	110	Average Incentive based on measure mix and is applied per participant (see line below)		
	Weatherization	2,260			
	Air Sealing Kit (Gas)	633			
	Showerhead	358			
	Pipe Wrap	5,500			
	THERMOSTAT	1,650			
	WiFi THERMOSTAT	275			
	Participants	1,966	$4,251.73	$8,359,746	
	Program Planning & Administration				$260,463
	Marketing				$85,024
	Sales, Technical Assistance & Training				$1,140,166
	Evaluation & Market Research				$217,830

Gas Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Multifamily	Air Sealing_MF	3,900	Average Incentive based on measure mix and is applied per participant (see line below)		
	CUST NONLGT_MF	20			
	Duct Sealing_MF	140			
	Faucet Aerator_MF	1,200			
	INSULATION_MF	3,600			
	Pipe Wrap (Water Heating)_MF	882			
	Programmable Thermostat_MF	600			
	TSV Showerhead_MF	250			
	WiFi thermostat gas_MF	300			
	Participant_MF	4,000	$304	$1,216,000	
	Program Planning & Administration				$56,643
	Marketing				$35,584
	Sales, Technical Assistance & Training				$154,375
	Evaluation & Market Research				$28,988
Home Energy Reports	New movers dual fuel	10,342			
	Optout dual fuel	123,401			
	Optout gas only	18,581			
	Refill				
	Program Planning & Administration				$11,037
	Marketing				$55
	Sales, Technical Assistance & Training				$428,489
	Evaluation & Market Research				$11,283
Residential New Construction	CODES AND STANDARDS	1	Average Incentive based on measure mix and is applied per participant (see line below)		
	CP	10			
	CPDHW	10			
	RR CP	5			
	RR CPDHW	5			
	RR Tier 1	10			
	RR Tier 1 DHW	10			
	RR Tier 2	20			
	RR Tier 2 DHW	20			
	RR Tier 3	5			
	RR Tier 3 DHW	5			
	RR Tier 4	1			
	RR Tier 4 DHW	1			
	SHOWERHEAD	20			
	Tier 1	40			
	Tier 1 DHW	40			
	Tier 2	100			
	Tier 2 DHW	100			
	Tier 3	30			
	Tier 3 DHW	30			
	Tier 4	2			
	Tier 4 DHW	2			
	Adaptive Reuse	100			
	Participants	323	$1,521	$491,175	
	Program Planning & Administration				$37,939
	Marketing				$2,363
	Sales, Technical Assistance & Training				$125,200
	Evaluation & Market Research				$18,149

Gas Programs					
Program	**Measure**	**Units**	**Incentive / Unit**	**Total Incentives**	**Shared Costs**
Income Eligible Single Family	HEATSYSTEM	294	$5,000	$1,470,000	
	WEATHER	726	$5,000	$3,630,000	
	Participants	867	$6,059	$5,253,000	
	Program Planning & Administration				$160,504
	Marketing				$26,398
	Sales, Technical Assistance & Training				$1,200,078
	Evaluation & Market Research				$98,794
Income Eligible Multifamily	Air Sealing_LI	550	Average Incentive based on measure mix and is applied per participant (see line below)		
	BOILER Commercial_LI	75			
	BOILER_LI	30			
	CUST NONLGT_LI	9			
	Faucet Aerator_LI	900			
	Insulatioin_LI	1,000			
	Pipe Wrap (Water Heating)_LI	500			
	Programmable Thermostat_LI	300			
	TSV Showerhead_LI	400			
	Participant (NEB)_LI	3,500	$762	$2,667,000	
	Program Planning & Administration				$89,513
	Marketing				$6,162
	Sales, Technical Assistance & Training				$414,554
	Evaluation & Market Research				$76,837

Attachment 2

2021 Commercial and Industrial Energy Efficiency Solutions and Programs

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1. Overview

The Commercial and Industrial (C&I) programs consistently offer highly cost-efficient savings. The Company is continuously evaluating and responding to customer needs and market dynamics to develop enhancements that secure deeper, more comprehensive savings while strategically evolving program designs to drive market transformation across multiple end uses.

The C&I sector encompasses a diverse and complex set of customers. National Grid is focused on a Market Sector Approach for commercial and industrial programs. This approach allows the Company to address customer needs that are shaped directly by the industry and geographies in which the customers operate, and on strategic and commercial pressures specific to the industry or sector, resulting in customized solutions that fit customers' needs and increase participation in energy efficiency.

The detailed program descriptions provided in each Annual Plan provide snapshots and evidence of how programs are continuously evolving, building from one plan year to the next. They translate high level strategies into specific actions and activities that secure savings for customers; help to contextualize specific program innovations and enhancements described more briefly in the Annual Plan; and demonstrate how key strategies cross multiple program designs and end use targets.

The detail in this attachment is designed to allow stakeholders, the Public Utilities Commissioners and staff, and other interested parties to delve deeply into and fully explore the complex interplay between specific customer and building types, program implementation and delivery, incentive design, and high efficiency technologies.

What to look for in 2021

The Company has focused on non-lighting opportunities across all commercial programs and program enhancements that help drive progress toward deeper comprehensive measure adoption in every customer class. The specific priority measures vary by customer but are reflective of opportunities highlighted in the Market Potential Study. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the EERMC and the EERMC consulting team, OER, the Division, and our vendors, as well as customer feedback. There are new market segment designs under development to engage new customers with tailored approaches to comprehensive savings adoption (new Telecommunications initiative), enhancements that make participation easier or more attractive (see Equipment and Systems Performance Optimization, Small Business), and multiple enhancements that focus on reduction of barriers to comprehensive measure adoptions (ex: Whole Building Streamlined pathway in New Construction).

Equity and workforce development objectives have been applied across the commercial portfolio, resulting in program design shifts and investment prioritization to ensure our small businesses customers are given access to program opportunities and that we succeed in building the workforce infrastructure that can deliver on the vision of transitioning to high performing technologies while also building robust jobs and economic development opportunities for Rhode Islanders. The plan includes trainings to build a workforce to support high performance buildings with advanced technologies, including trainings on advanced controls for HVAC and lighting, as well as an effort to grow the commissioning workforce.

Commercial & Industrial Programs

There are five Commercial and Industrial energy efficiency programs.

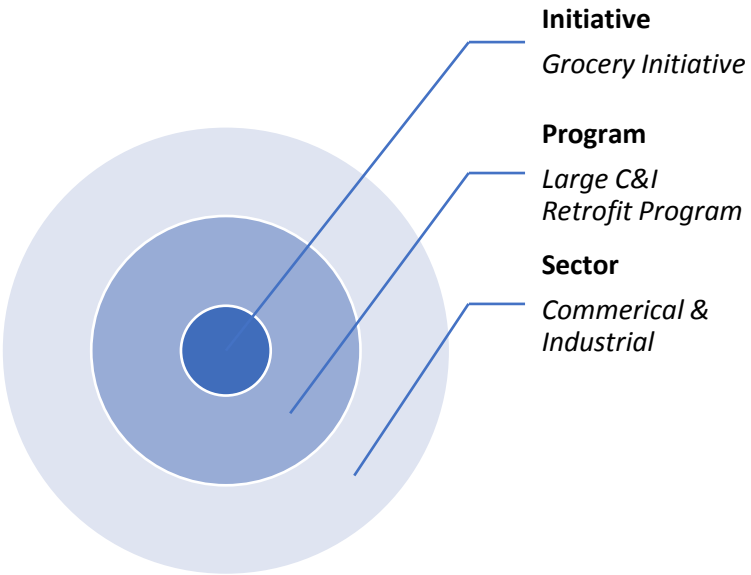
Table 1. Commercial and Industrial Programs

Large Commercial and Industrial New Construction
Large Commercial Retrofit
Small Business Direct Install
Connected Solutions (Active Demand Response)
C&I Multifamily Program

All C&I customers are eligible to participate in the Large Commercial and Industrial New Construction Program and the Large Commercial Retrofit Program. The Small Business Direct Install (SMB/DI) Program, however, is restricted to customers who consume less than 1,000,000 kWh per year. Larger and more complicated measures not offered by the SMB/DI vendor can be accessed by small business customers through the New Construction or Retrofit Programs.

Within a given program, there may be one or more initiatives that offer a targeted approach or tailored delivery design to more effectively and efficiently attract and secure savings from target customers. An initiative is defined as a go to market strategy within a Program that promotes a subset of measures or services within that program and/or targets a certain segment of customers. Examples include the Indoor Agriculture Initiative within the New Construction Program and the Grocery Initiative within the Large Commercial and Industrial Retrofit Program. Anticipated savings, budgets, and participants for each initiative are included in the program-level totals.

Figure 1. Relationship between Programs and Initiatives



This attachment provides detailed descriptions of C&I energy efficiency and active demand response programs and initiatives, including detail on the target market (customer/building types), eligibility requirements, offers, implementation and delivery, and changes for 2021, along with the rationale for changes, in a standardized table format.

Enabling strategies for efficient delivery, better customer experience, and participation in energy efficiency programs are covered in the Finance and Marketing sections. Workforce development is addressed in the main text and covers initiatives for training, education, and awareness. A list of measures and incentives can be found in Section 0. The Company will continue to focus on demonstrations and assessments; please refer to Attachment 8 for a detailed scope and list for each pilot, demonstration, and assessment proposed for the 2021 Energy Efficiency Plan.

Program Description Structure

In order to streamline PUC, stakeholder, and reader access to the most pertinent program information in the 2021 Annual Plan, the Company has adopted the following structure for each of the programs and program initiatives:

Eligibility Criteria	This section describes which customers and/or building types are eligible for participation in the program or initiatives.
Offerings	This section describes the offers available to customers under the program or initiative. It can include technical assistance, incentives,

	design support, verification services and financial offerings. This section also describes the various pathways by which a customer or building can participate in a program or initiative.
Implementation and Delivery	This section describes the process by which the Company engages the customer with energy efficiency programs and offerings.
Customer Feedback	Customer feedback can be received by the Company in various ways; via an implementation vendor, direct feedback from the customer, via surveys conducted by the Company.
Changes for 2021	The section captures the changes proposed in the year stated.
Rationale for Changes	Captures the rationale for the changes proposed in the planning year.
Proposed Upcoming Evaluations	Evaluation information can be found in this section at the program level. Initiatives like the Grocery Initiative or the Industrial Initiative are typically not evaluated. The measures included in these initiatives are evaluated as part of larger evaluations for the programs. Hence at the initiative-level tables you will not see this "Proposed Upcoming Evaluations" section.
Notes	Additional notes related to the program, customer, offerings etc.

Financial Mechanisms Structure

Customer type	This section highlights the customer consumption in kWh or customer type for which the mechanism is best suited
Loan size	Shows maximum loan size
Maximum Tenor	Shows the maximum length of time for which a customer can borrow funds
Loan Volume	Shows the dollar volume of loans outstanding or the range of funds borrowed in the past years or both
Benefits to customer	Describes the benefits of a mechanism to a customer
Limitations	Describes the limitations of a mechanism to a customer
2021 Actions	This area is included for EBF and C-PACE as the Company is working with RIIB and others on these mechanisms

More information	This area describes where more information can be found on the mechanism such as numeric tables. This area may also include additional information such as justifications for OBR fund injections (gas) or OBR rightsizing (electric)
Relevant notes	This area contains notes and will vary from mechanism

Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane[1])	Budget ($000)	Participation[2]
Electric						

Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas				

The below figures compare the distribution of the commercial and industrials sector's energy savings goals when measured in annual savings compared to lifetime savings. The lifetime metric captures the long-term energy savings whereas the annual metric shows the first year savings only.

[1] For a breakdown of program level energy savings goals see Attachment 5, table E6-A and Attachment 6, table G6-A for more details.
[2] For information on the metric used to measure participation by program, please reference the main text, section 4.5

Figure 2. 2021 Planned Distribution of Lifetime MWh Goals for C&I Electric Sector

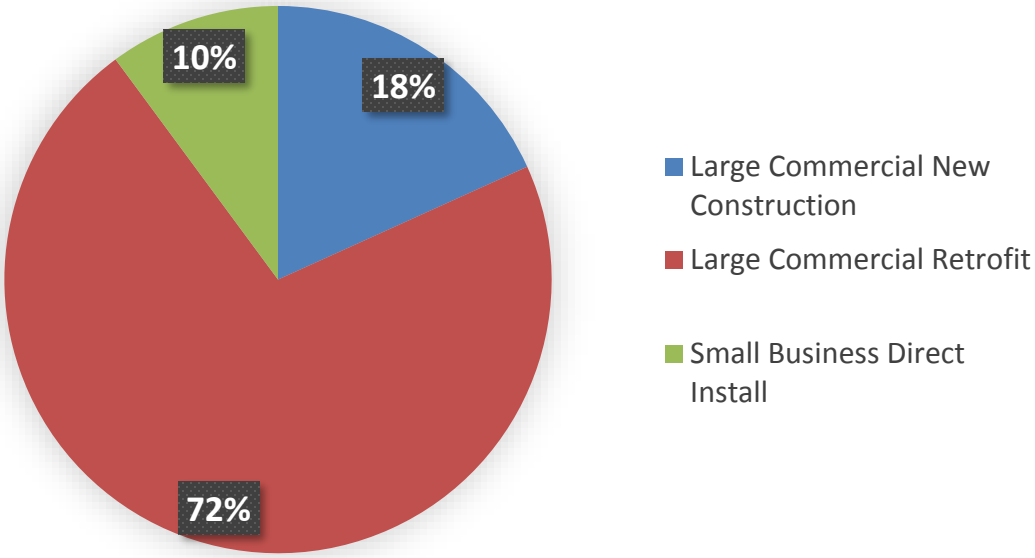


Figure 3. 2021 Planned Distribution of Annual MWh Goals for C&I Electric Sector

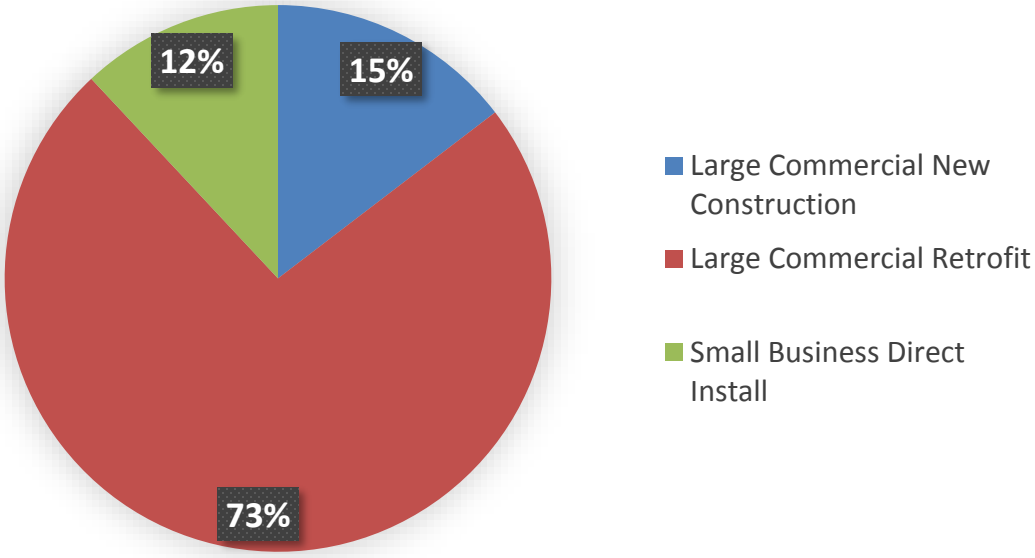


Figure 4. 2021 Planned Distribution of Lifetime MMBtu Goals for C&I Gas Sector

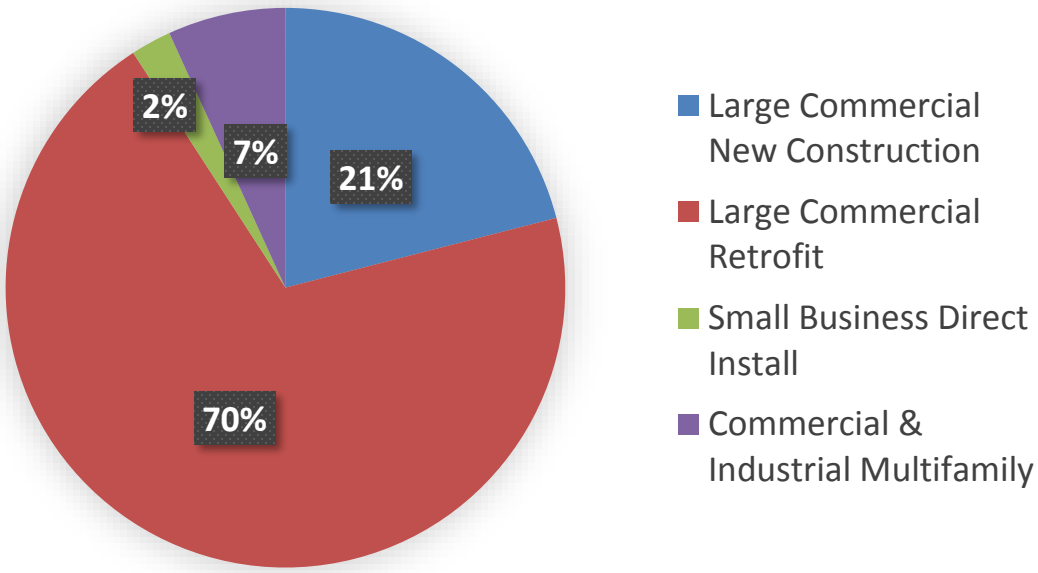
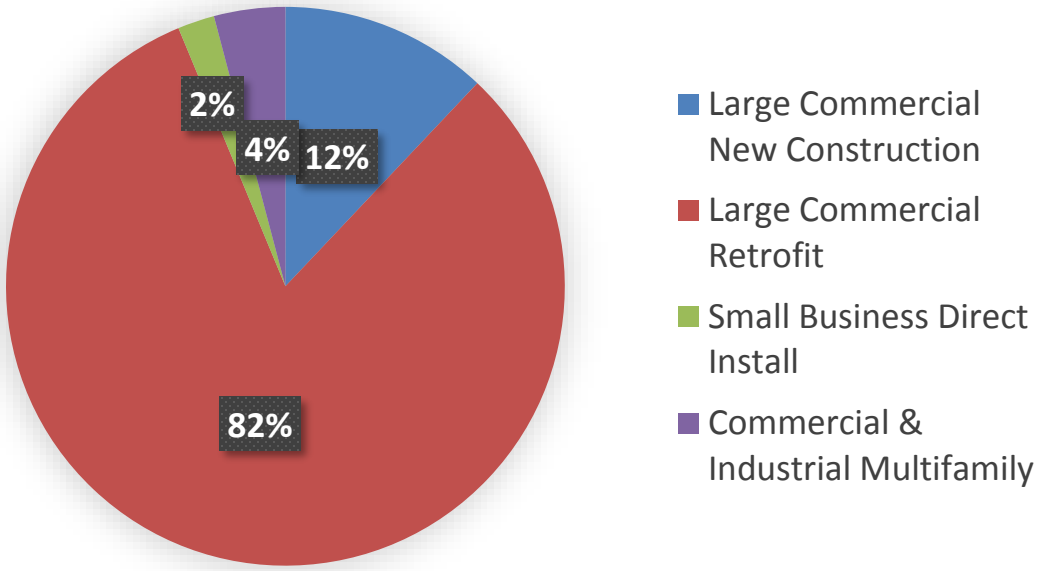


Figure 5. 2021 Planned Distribution of Annual MMBtu Goals for C&I Gas Sector



2. Large Commercial and Industrial New Construction Program

Eligibility Criteria	The New Construction Program is divided into two main categories to address the two primary new construction target markets: those pursuing ground up new construction and major renovations, and those investing in new equipment and major systems upgrades. **New Buildings, Additions, Major Renovations and Tenant Fit-Ups** This is specifically for projects that are ground up new construction or major renovations, all of which traditionally involve some level of design and are governed by code. **End of Life Replacements** Typically, there is no design component to these projects. Customers purchasing new energy-consuming equipment or replacing equipment that has reached the end of its useful life are incentivized to purchase and install energy efficient equipment. Customers are encouraged to make efficient choices with every category of equipment purchase. The baseline energy is considered to be the energy code; savings are calculated from the baseline energy. Where equipment has reached the end of its life, savings from new measures are calculated not from the old equipment, but assuming all new equipment against the current codes and standards baselines. This works the same way as the "systems approach" described below, whether through prescriptive or custom pathways.
Offerings	**New Buildings, Additions, 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 RI program energy baseline. Technical assistance ranges from simple plan review and efficiency upgrade recommendations to complete technical reviews. Incentives are available for building owners, design teams, post occupancy verification, and Zero Net Energy certification and verification. The Large Commercial and Industrial New Construction Program offers four pathways for ground up new construction or major renovation projects. • **Path 1: Zero Net Energy Ready**

- **Path 2: Whole Building Energy Use Intensity Reduction**

These two paths are based on achieving energy use intensity (EUI) project goals and are suitable for projects that engage early in the schematic design process.

- **Path 3: The Whole Building Streamlined**
- **Path 4: Systems Approach**

These pathways support projects that are in the design development stage and incorporate energy efficient equipment and energy conservation measures (ECMs).

Table 2. Requirements and Eligibility for Large Commercial and Industrial New Construction Pathways

Zero Net Energy Ready	Achieve 25 EUI or lower	Over 20,000 Square Feet
Whole Building Energy Use Intensity	Achieve 10% better than RI Baseline EUI	Over 50,000 Square Feet
Whole Building Streamlined	Custom and Prescriptive ECM measures	20,000 to 100,000 Square Feet
Systems Approach	Prescriptive rebates for installing energy efficient equipment and measures	No Square Foot requirement

Zero Net Energy Ready: This path provides building owners and design teams with energy efficiency expertise and financial incentives to help achieve a very low EUI and Zero Net Energy Ready projects. This path focuses on EUI outcomes during design modeling and in post occupancy. To qualify, the planned building must include a minimum of 20,000 square feet of heated and cooled spaces, commit to achieving an EUI of 25 or less, engage National Grid before 50% Schematic Design, and commit to commission the completed building. An exception to the EUI of 25 or less requirement may be sought based on the type of building or hours of operation.

Whole Building Energy Use Intensity Reduction: This path is based on achieving EUI project goals and is suitable for projects that engage before the end of design development. Buildings over 50,000 square feet (mid- to large-size building) are eligible. This pathway provides energy efficiency expertise to building owners and design teams early

	in the design process. Technical assistance supports setting aggressive EUI targets and providing financial incentives to meet the EUI goals. To be eligible for incentives in this pathway, projects need to achieve a minimum 10% EUI reduction from the RI baseline. The RI baseline for 2021 will be based on the current RI building code. **Whole Building Streamlined**: This pathway provides design teams and owners energy efficient expertise in selecting the most cost-effective energy conservation measures for small- to mid-sized buildings that are early in project design. This pathway is applicable for projects 20,000 square feet to 100,000 square feet. Incentives are provided based on savings achieved by the energy saving measures implemented (Custom and Prescriptive measures). A whole building spreadsheet analysis tool is used to estimate energy savings and incentives early in the project. **Systems Approach**: This pathway provides incentives to building owners for incorporating energy efficient equipment into projects under 20,000 square feet and for major renovation projects that do not include the entire building (e.g. tenant fit outs).
Implementation and Delivery	**Zero Net Energy Ready:** The sales team reaches out to potential customers and design teams that may be interested in building to a Zero Net Energy (ZNE) Ready standard. After vetting a project to ensure that it meets the program requirements, a ZNE expert is brought in to assist the customer in assessing the project and identifying services that may be needed to achieve the ZNE goal. The ZNE consultant will be engaged by the customer, with the fee cost-shared between National Grid and the customer. The ZNE consultant is engaged from early in the project through the end of design development. They provide services such as EUI benchmarking to help set EUI targets, conduct an energy charrette, load reduction analysis, and HVAC selection analysis and model feedback. The customer signs the program memorandum of understanding (MOU). The project incentives are paid out to the customer in two payments: the construction incentive and the post occupancy incentive. The first customer incentive payment (as well as any design team incentive) is paid based on review of the design teams' model and verification that the design achieves an EUI of 25 or less (or the expected EUI target if there is a special exception). The

	second customer payment is available when one-year post-occupancy data demonstrates the building is achieving the target EUI, confirming that the building is performing as designed. Prior to the post occupancy payment, the customer must provide verification that the enhanced commissioning and envelope commission have taken place. The ZNE certification fees will be reimbursed when a project becomes ZNE certified. An optional verification incentive is offered to assist customers in identifying and correcting issues that may arise in post construction to help achieve the EUI during building occupancy. **Whole Building Energy Use Intensity Reduction:** The National Grid Energy Efficiency sales team reaches out to customers, owners, and developers regarding new construction project opportunities. If the customer decides to participate in energy efficiency programs, the National Grid team engages with the customer project design team and facilitates a design charette to establish customer project goals. Based on the project goals, an EUI target range is established, and a technical assistance (TA) vendor is engaged to model the baseline project and proposed design project. The customer then signs a MOU that outlines the EUI target that is included in the project documents and the post occupancy EUI verification plan and the other incentive details. An application including the energy conservation measures and systems agreed upon is signed by the owner. The owner commits to implement the efficiency recommendations and accepts the associated incentives. A Minimum Requirements Document (MRD) created by the National Grid Tech Rep is created as part of the application process. The National Grid sales team remains engaged during the design development and construction process to ensure energy efficiency measures and solutions are incorporated in the building projects to achieve the EUI targets. After completion, the project undergoes a post inspection that includes a visual inspection and review of construction design submittals. If there are any HVAC controls or variable load ECMs that have been incorporated in the project, field measurements are required to verify operation standards, as described in the Minimum Requirements Document. The EUI measurements are then monitored over a prescribed period, under the prescribed conditions, before final incentive payment is made based on the savings achieved. An optional verification incentive is offered to assist customers in identifying and correcting issues that

	may arise in post construction to help achieve the EUI during building occupancy. Verification documents must be submitted to obtain the optional verification incentive. **Whole Building Streamlined:** The National Grid sales team reaches out to the customers who are engaged in new construction. Occasionally, the sales team may be approached by the design team regarding a new building project. If the project meets the path requirements (small to mid-size buildings; between 20,000-100,000 sq.ft.), a technical vendor is brought in at no-cost to the customer to conduct an energy charrette and provide feedback on the building design to increase the project's energy efficiency. An MOU is signed. The technical vendor monitors the design progress and provides an estimate of energy savings and incentives at a mid-design review. A final technical report is provided at design completion that details the project savings and incentives to develop the incentive application and MRD. Once the building has been built, the customer and design team incentives are paid upon construction and MRD verification. **Systems Approach:** The National Grid sales team approaches customers, building owners, and owner representatives regarding new construction or major renovation projects. When a customer decides to move forward with a project, the customer has a choice to use their vendor of choice to install measures or to develop the project with technical assistance from the National Grid team. Once the project is installed, the project undergoes inspection of installed measures and review of design submittals. Incentives are paid out to the owner on documented savings from the project. Prior to the launch of the above stated New Construction pathways in 2021, the Company will determine the appropriate incentive structure to drive participation in these program pathways (ZNER, Whole Building EUI pathway, Whole Building Streamlined pathway and Systems Approach).
Customer Feedback	Customer feedback is gained through sales team interactions with customers and design teams, who regularly provide insights on what types of technical assistance and design support moves the builders

	and architects and end customers to adopt the high efficiency measures and design.
Changes for 2021	The Company will **offer two new pathways, Zero Net Energy Ready (ZNER) and Whole Building Energy Use Intensity** to drive deeper, more comprehensive savings by using EUI as a tool. For both new pathways, the Company will **offer technical assistance to building owners and design teams** to set EUI goals and assist with modelling projects at various stages of design including comparison to the RI baseline and predicted EUI. Customers are required to develop a plan for measurement and verification of projects' operational EUI. An optional post occupancy verification incentive is also available to projects. Incentives will be paid $/square foot on achieving EUI goals. The Company will set the EUI threshold for the two new pathways based on the MA Accelerate Performance demonstration and MA Program Administrators' experience with Zero Net Energy Buildings. Buildings following the Zero Net Energy Ready pathway must achieve a threshold of 25 EUI or less. Buildings pursuing the Whole Building Energy Use Intensity pathway must achieve a threshold of 10% better than the RI baseline EUI. The Company will **modify and rename the Integrated Design pathway the Whole Building Streamlined pathway**, which is targeted to small and medium buildings. The goal is to simplify the process by using a streamlined spreadsheet methodology to calculate savings in to increase participation by smaller buildings. Prior to the launch of the above stated New Construction pathways in 2021, the Company will **determine the appropriate incentive structure to drive participation in these program pathways** (ZNER, Whole Building EUI, Whole Building Streamlined and Systems Approach). In January 2021, **RI plans to adopt the 2018 IECC building code**. RI program baselines, where applicable, will then be based on the 2018 IECC Building code and savings calculations will be based upon achievements over this new higher baseline. This is an improvement from the 2019 adoption of the 2015 IECC building code, which meant that 2020 RI program-based savings were based on savings above 2015 IECC code.

	The Company plans to **determine a pathway to incentivize architectural firms to participate in the American Institute of Architects (AIA) 2030 Challenge** (https://architecture2030.org/2030_challenges/2030-challenge), which aims to transform the practice of architecture in a way that is holistic, firm-wide, project based, and data-driven. By prioritizing energy performance, participating firms can more easily work toward carbon neutral buildings, developments and major renovations by 2030. Participating architectural firms commit to tracking the Energy Use Intensity of their projects and their portfolio annually and then reducing their designed EUI to a carbon neutral level by 2030. The Company will research an AIA 2030 Challenge offering in 2021 and determine a path forward in 2021-2022.
Rationale for Changes	Realized savings in the existing New Construction program have declined. Thus, in the past two years, the Company tested the EUI target as a way to achieve deeper savings with new construction projects through the Accelerate Performance demonstration in both MA and RI. While in RI there was no participation in the program, in MA the Program Administrators have had success with the demonstration. The rationale for introducing two new pathways – ZNER and Whole Building EUI – is to drive deeper, more comprehensive savings by using EUI as a tool. Incentives will be based on actual building performance versus modeled savings. The Company believes these changes in the program pathways will result in higher realized (actual) savings in new construction projects.
Proposed Upcoming Evaluations	There are a number of ongoing and new evaluations planned for 2021. The following evaluations are relevant to the Large C&I New Construction Program, as well as the Large C&I Retrofit Program. • PY2019 Impact Evaluation of Custom Gas Installations (continued from 2020) • PY2020 Impact Evaluation of Custom Gas Installations (to begin in 2021) • PY2018 Impact Evaluation of Custom Electric Installations (continued from 2020) • PY2019 Impact Evaluation of Custom Electric Installations (continued from 2020)

	• PY2020 Impact Evaluation of Custom Electric Installations (to begin in 2021) The following evaluation is specific to the Large C&I New Construction Program. • C&I ISP and Baseline (to begin in 2021)
Notes	

Large Commercial and Industrial New Construction – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	189,441	11,837	1,856	605,151	8,500	144

Large Commercial and Industrial New Construction – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	437,398	27,631	2,759	61

3. Initiatives Specific to Large Commercial and Industrial New Construction Program

3.1. Performance Lighting Plus

Eligibility Criteria	Any customer with a commercial meter is eligible to participate in this initiative. All projects that qualify under this incentive must: • Be a new construction or renovation project that includes the installation of new fixtures and qualifying lighting controls for commercial, industrial, educational, or municipal building(s). • Be a code-dependent project or extensive/substantial renovation. • Average a minimum of 2,000 hours per year. • Provide maintained light levels in accordance with the recommendations of the Illuminating Engineering Society of North America's 10th Edition Lighting Handbook or supporting Design Guides.
Offerings	**Incentives** Incentives may be offered for reducing the code mandated Lighting Power Density from the IECC baseline or a component-based approach that has been successful for other utilities/ program administrators. Additionally, design assistance will be made available to customers for the purpose of optimizing lighting design and lighting energy savings. The objective of the design assistance is to influence the lighting project at an early stage and to ensure that energy efficiency is considered and support throughout the implementation of the project The precise incentive offerings and requirements for Performance Lighting Plus are still being revised for 2021 in concert with National Grid's Massachusetts colleagues. The Company will update this offering so that it is easier for customers to proceed along this path, remove inconsistencies, and make updates that reflect changes in the lighting market. The changes will be complete and published no later than Q1 2021. While details will be finalized with respect to the aforementioned considerations, the finished work product will be similar to the previous version of the Performance Lighting Plus initiative in that there will be multiple tiers where additional controls savings or fixture

	capabilities will lead to a larger incentive offering. New construction and retrofit projects will both be able to participate in this offering. The new offering is likely to differ from the previous offering in the following ways: 1. TLEDs without controls may be excluded from all tiers of the offering, including the base offering. Other utilities/ program administrators have already instituted this change in other states. 2. The Company will consider integrating the benefits of active demand response, a requirement of Tier 3 projects, into the sales presentation for this offering. 3. Incentives will most likely be stated to the customer in $/Square Foot (SF) or $/kWh saved as opposed to watts saved. The Company commits to working with the lighting sub-group of EERMC consultants to take into account other important factors before the offering is complete and published to customers.
Implementation and Delivery	**Application Forms** • Applications for Performance Lighting Plus incentives are made available through vendors, 3rd party implementers, and Customer Solution Sales Team. However, applications can also be created and submitted online using the Rhode Island Application Portal (RIAP). **Pre-Approval Requirements** • The Customer must submit a copy of the Manufacturer's technical specification sheets ("cut sheets") for each type of eligible equipment to be purchased. • Once pre-approved, a "pre-approved incentive letter" will be issued. **Installation and Incentive Requirements** • Once pre-approved, the customer must purchase and install the qualifying equipment within twelve (12) months of National Grid's pre-approval • Next, the Customer must return the following required information to National Grid within 30 days of the installation:

	○ A copy of the completed and signed pre-approval application ○ If there is a change in equipment, the customer must submit a new manufacturer's technical specification sheets ("cut sheets") for each type of eligible equipment purchased ○ A copy of the invoice indicating Proof of Purchase must indicate type, size, make, and model number of the equipment and date of purchase and installation ○ At the post-installation verification, the customer must sign the post-installation customer acknowledgement section of the original application **Application Process and Requirement for National Grid Approval** • The customer shall submit a completed application to National Grid. The customer may be required to provide National Grid with additional information upon request by the National Grid. The customer will, upon request by the National Grid, provide a copy of the as-built drawings and equipment submittals for the facility after energy efficiency measures are installed. To the extent required by the National Grid or by applicable law, regulation or code, this analysis shall be prepared by a Professional Engineer licensed in Rhode Island. • To be eligible for performance lighting plus incentives, a customer must have an active electric account. • The National Grid reserves the right to reject or modify the customer's application. National Grid may also require the customer to execute additional agreements, or provide other documentation prior to National Grid approval. If National Grid approves the customer's application, National Grid will provide the customer with the Approval Letter. • National Grid reserves the right to approve or disapprove of any application or proposed performance lighting plus incentive. • The criteria listed under Application Process and Requirement for National Grid Approval do not apply in the event that the Program Materials explicitly state that no Approval Letter is required for the Program. In such an event, the customer must submit to National Grid the following: ○ Completed and signed Program rebate form

	○ Original date receipts for purchase and installation of energy efficiency measures, and ○ Any other required information or documentation within such time as Program Materials indicate. **Pre- and Post-Installation Verification; Monitoring and Inspection** • The customer shall provide access to their facility and energy efficiency measures for National Grid's pre-installation and post-installation verifications. Such verifications must be completed to National Grid's satisfaction. • National Grid may perform monitoring and inspection of the energy efficiency measures for a three-year period following completion of the installation in order to determine the actual demand reduction and energy savings.
Customer Feedback	Customer feedback is gained through sales team interactions with customers and design teams, who regularly provide insights on what types of technical assistance and design support moves the builders and architects and end customers to adopt the high efficiency measures and design. The Company is also exploring the potential value of a lighting survey for designers, reps, and contractors involved in this program as the result of discussions with the EERMC Consultants.
Changes for 2021	The precise incentive offerings and requirements for 2021 are still being revised in concert with National Grid's Massachusetts colleagues. The Company will **update this offering so that it is easier for customers to proceed along this path, remove inconsistencies, and make updates that reflect changes in the lighting market** (see Offering section above for additional detail). The Company commits to working with the lighting sub-group of EERMC consultants to take into account other important factors before the offering is complete and published to customers.
Rationale for Changes	The goal of these changes is to increase savings through this pathway by: • Simplifying the application and processing; • Ensuring that that incentives are calibrated correctly in relationship to the lighting portfolio; and • Ensuring that vendors understand the benefits and proper installation of these systems.
Notes	Although this program is located in the New Construction section of this plan, it may also be utilized in Retrofit applications as well.

4. Large Commercial Retrofit Program

Eligibility Criteria	The Large Commercial Retrofit Program serves the needs of existing buildings in their pursuit to lower energy consumption. All commercial and industrial customers are eligible for the Large Commercial Retrofit Program.
Offerings	The Company has several pathways by which customers can participate in the Large Commercial Retrofit program for energy efficiency in existing buildings. Customers can participate via the: • **Prescriptive application** process; • By working with a National Grid Sales Representative or a Project Expeditor (PEX) to complete a **Custom application** for any energy improvement that is not covered by the Prescriptive pathway; or • Via an **Upstream program**. The retrofit program also has initiatives specific to Market sectors such as grocery and manufacturing/industrial initiatives that focus on specific needs of that customer type. The Company serves some of its largest customers through Strategic Energy Management Plans (SEMPs). The company has Memorandums of Understanding (MOUs) with these customers that specify savings targets and resources. These are described in more detail in section 5.5. The Company has found that although sector specific initiatives and SEMPs are helpful in gathering more savings and completing measures beyond lighting, they do not cover our entire customer base. The following areas that are specific to a technology or do not address a specific market sector are also included as part of the Large Commercial Retrofit program and are included in this section of the plan: • Customer Owned Streetlights • Company Owned Streetlights • Equipment & System Performance Optimization • Combined Heat and Power (CHP) • Fuel Cells
Implementation and Delivery	**Prescriptive Application**

	Customers complete a prescriptive application through the Rhode Island Digital Application Portal (RIDAP; https://www.ridap.nationalgridus.com) for a wide variety of energy efficient products such as lighting, air compressors, or variable speed drives (VSDs). **Upstream** Customers can purchase qualified products such as luminaires, kitchen equipment, water heating equipment, or more efficient heating and cooling technologies at participating distributors at a discount without needing to submit an application. These are collectively known as the Upstream Initiatives. These are described on more detail in section 5.15. **Custom Application** National Grid Sales Representatives or a Project Expeditor (PEX) assist customers to complete custom applications for any energy conservation measure that is not covered by Prescriptive or Upstream pathways.
Customer Feedback	Please see Initiatives sections for customer feedback.
Changes for 2021	In 2021, the Company will **launch a new Telecommunications Initiative** to serve mobile, fiber optic, and cable data companies and their associated infrastructure through technical assistance, project management, and incentives, delivering savings from non-lighting as highlighted in the Market Potential Study. This initiative is described in more detail in section 5.16. In 2021, the Company will **pursue a custom fuel cell project** that will enable the customer to generate on-site electricity and reclaim carbon dioxide for process related needs. The project is currently in the design phase but is expected to be installed by late 2021. Specific changes to initiatives in 2021 are described in section 5 below.
Rationales for Changes	Changes in the Large Commercial Retrofit programs will help generate savings, address customer and vendor feedback, and provide more customized solutions and options.
Proposed Upcoming Evaluations	There are a number of ongoing and new evaluations planned for 2021. The following evaluations are relevant to the Large C&I Retrofit Program, as well as the Large C&I New Construction Program.

	• PY2019 Impact Evaluation of Custom Gas Installations (continued from 2020) • PY2020 Impact Evaluation of Custom Gas Installations (to begin in 2021) • PY2018 Impact Evaluation of Custom Electric Installations (continued from 2020) • PY2019 Impact Evaluation of Custom Electric Installations (continued from 2020) • PY2020 Impact Evaluation of Custom Electric Installations (to begin in 2021) The following evaluations are specific to the Large C&I Retrofit Program. • Upstream Lighting Impact Analysis (continued from 2020; MA study with RI sites) • Strategic Energy Management Demonstration Evaluation (continued from 2020)
Notes	

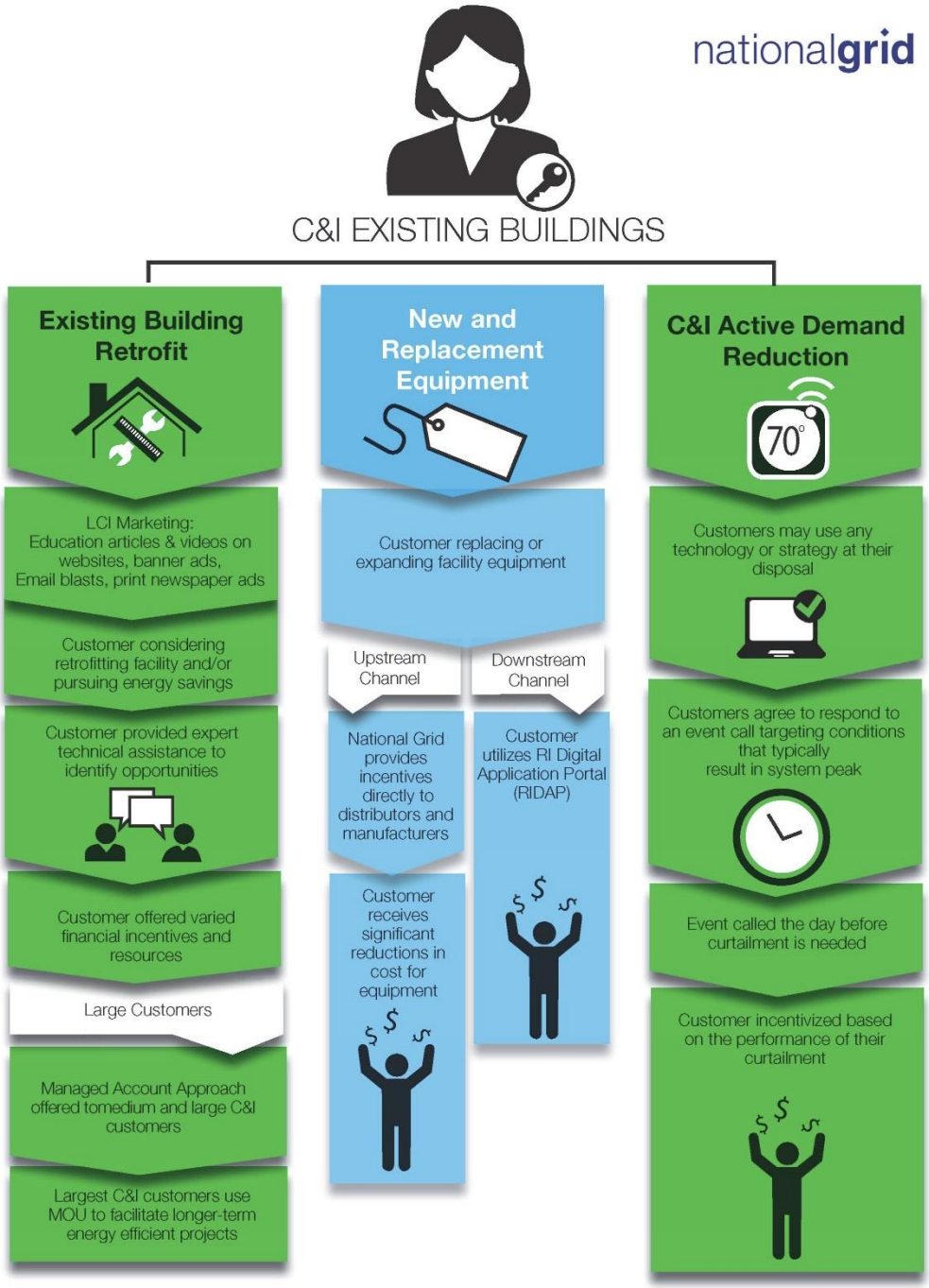
Large Commercial Retrofit – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	744,562	59,496	11,648	1,795,610	31,930	3,146

Large Commercial Retrofit – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	1,455,776	187,283	5,169	98

Figure 6. Large Commercial Retrofit Program (Existing Buildings)



5. Initiatives Specific to Large Commercial Retrofit Program

5.1. Grocery Initiative

Eligibility Criteria	EnergySmart Grocer (ESG) is an initiative that serves commercial customers who sell food at the retail or wholesale level.
Offerings	Technical assistance, project management, incentives, financing, installer and customer educations sessions.
Implementation and Delivery	This program is administered by the vendor. Company Account Managers associated with each vendor partner with the sales team to develop a relationship with the prospective customer. Once the relationship is established, EnergySmart Grocer (ESG) offers no-cost audits to the customer. This audit documents and identifies energy efficiency opportunities for the store's refrigeration, lighting, HVAC and kitchen equipment. Once the audit is complete, an Energy Savings Report is generated and presented to the customer. EnergySmart Grocer works with the customer's contractor to obtain a quote for the work. If the customer decides to move forward with the project, EnergySmart Grocer will generate an application, collect all necessary paperwork, and submit to National Grid for pre-approval. Once the project is complete, ESG will collect all invoices and final signatures, and complete a post-inspection verification to ensure the measures are installed as intended. ESG will submit all paperwork to National Grid and notify the customer when the incentive check is in the mail. ESG Account Managers maintain relationships with the customer. For smaller independent chains, the program uses an inform-to-invest strategy where the success of the first project is leveraged to pursue deeper and more expensive measures. For the regional and national chains, Account Managers schedule regular check-ins with the customer's Energy Manager to check-in on active projects and learn of future projects.
Customer/Vendor Feedback	Customer feedback flows through the ESG Initiative vendor to internal parties at National Grid. The Company's vendor has asked for financing support for small and mid-size independent grocers, as they believe this will allow such customers to commit to projects more quickly or increase the number of measures installed. The Company will provide this assistance through OBR or through an

	interest buy down mechanism in partnership with third party providers of debt capital.
Changes for 2021	**New measures will be deployed in 2021** including energy efficient hand dryers, anti-fog film, and adding doors to self-contained refrigerated cases to support "click and collect" customers who purchase their groceries online and pick them up in designated in-store locations. The Company will **provide financing support for small- and medium-sized independent grocers** through OBR or through an interest buy down mechanism in partnership with third party providers of debt capital.
Rationale for Changes	See customer feedback for financing changes. New measures are offered to maintain savings within this sector and provide customers with more options to save energy.
Notes	The Company will conduct an assessment investigating the energy savings and carbon reduction benefits of integrating leak detection and repair as a standard offering. Currently this work is done when leaking refrigerant is visible to the naked eye or identified as a problem by the customer.

5.2. Industrial Initiative

Eligibility Criteria	The Industrial Initiative offerings are available to all manufacturing and industrial customers.
Offerings	The following assistance and incentives are provided under the Industrial initiative: technical assistance; project management; measure incentives; installer and customer educations sessions; monitor-based commissioning; production systems and line efficiency coordination; and support in identifying and implementing process-related energy efficiency improvements that increase the efficiency of both energy use and business processes. The ability to participate in the Strategic Energy Management Demonstration, now called the Continuous Energy Improvement demonstration, has been offered to industrial and manufacturing customers since 2019. These customers will continue to be able to participate through 2021, the final year of the demonstration. Please refer to Attachment 8 for details on

	the demonstration, which is implemented by a separate vendor from the Industrial initiative.
Implementation and Delivery	The National Grid Sales Representative is responsible for identifying customers or "leads" for the Industrial Initiative Vendor to pursue for participation in the Industrial Initiative. The Company's trade allies also provide additional leads directly to the Industrial Initiative vendor. Prior to the initial site visit, National Grid provides the Industrial Initiative vendor with customer billing and interval data. This allows for the following analysis, some or all of which are typically done by the Vendor: interval data analysis; peak day loads; average weekday load shapes; average weekend consumption; base load energy usage; and a review of electric and gas usage and weather correlations (heating/cooling). In some cases, based on this analysis, the customer may be referred to the Company's demand response program. A kickoff meeting is scheduled with the National Grid Sales Representative and the Customer. The National Grid Technical Representative is also notified and welcome to participate. The kickoff meeting is typically followed by a site tour to identify potential energy efficiency measures. During the site tour, metering equipment may be deployed to assist with energy efficiency measure development. After the initial site visit, the Industrial Initiative vendor provides the customer and National Grid a follow up report on the opportunities identified and next steps. The report is typically reviewed with the customer and the Sales Representative. The measures identified are tracked in the Industrial Initiative vendor's Customer Relationship Management (CRM) system. The Industrial Initiative works closely with the customer's facility staff and vendors/contractors to develop "custom measure" workbooks to calculate potential savings and the incentives. A "Tech Check" is submitted to the National Grid Technical Representative and Sales Representative to validate the proposed savings calculation methodology before the workbook is developed. Once the Company approves the

	custom workbook, the Sales Representative communicates the incentive to the customer. The Industrial Initiative Project Manager facilitates the application process from the earliest stage of measure through the completion of the project. The incentive application process may include formal status meetings with the Company's Sales Representative and the Industrial Initiative vendor. To facilitate continuous improvement, the Technical Representative, the Sales Representatives and the Industrial Initiative vendor work together to continually engage and encourage the customer to realize more comprehensive energy savings.
Customer/Vendor Feedback	Customer feedback flows through the Industrial Initiative vendor and Sales Representative to internal parties at the Company. Feedback suggested using a service such as "DocuSign" to facilitate the application approval process, which the Company will implement in 2021. It was also recommended that the Company add business rules that account for savings accuracy when approving smaller "custom" projects so that the customer receives an approval quickly without excessive information requests, which is under consideration.
Changes for 2021	The Company will **add a digital signature option to the application approval process**. The initiative will **increase focus on customers in the 200-400 kW range** to encourage greater participation by small- and medium-sized commercial customers.
Rationale for Changes	The digital signature process was recommended by customers and the industrial initiative vendor to reduce administrative burden and expedite project sign-offs. Small- and medium-sized commercial and industrial customers have not realized the same percent energy reduction via efficiency as their larger counterparts. The Company is working with the Industrial Initiative vendor to increase participation among this valuable customer segment.
Notes	The Industrial Initiative has installed and performed energy efficiency assessments on a number of the measures identified

	in the Market Potential Study including but not limited to: Boilers, Boiler Tune-Ups, Heat Recovery, HVAC Equipment and Systems, LED Lighting, Energy Management Systems, Demand Control Ventilation, System Controls, and Steam Traps.

5.3. National and Regional Restaurant Initiative

Eligibility Criteria	The Serve Up Savings (SUS) initiative will serve regional/multi-state and national restaurant chains not currently engaged with Strategic Energy Management Partnership Agreements (SEMPs). Restaurants with multiple locations within Rhode Island only will be served by the Small Business Program.
Offerings	Technical assistance, project management, incentives, work with franchisors to come up with a package of measures that will work for their franchisees
Implementation and Delivery	Serve Up Savings works hard to minimize the effort needed for the customer to participate in the program. The first interaction is a Serve Up Savings Account Manager reaching out to the customer to introduce the program and schedule an audit of their stores. Once the audits are complete, the program puts together an Energy Savings Report which details the energy efficiency upgrade opportunities. The program works with the customer's preferred contractor or recommends three if they don't have one. The program obtains a bid for the work, so the customer can decide to move forward based on their financial metrics. The program will collect all required paperwork and submit to National Grid for pre-approval of incentives. Once pre-approved, the program will send the customer a commitment letter which details the financial incentives. The customer contracts directly with the contractor to complete the work. Once the work is finished, the program completes a post-inspection as well as collects all final paperwork. The program submits all paperwork to National Grid and a check is sent to the customer. The program leverages this check to push installation of the next set of measures to be installed at their stores.
Customer/Vendor Feedback	The Company's vendor regularly collects insights and feedback from customers. National Grid's sales team and program managers regularly check in with vendors to capture this feedback.

Changes for 2021	No changes are anticipated for 2021.
Rationale for Changes	N/A
Notes	

5.4. Lodging Initiative (including On Premise Laundry) Research

Eligibility Criteria	A prospective future Lodging Initiative (LI) would serve hotels, motels, and resorts. The Company envisions that it would also include On Premise Laundry (OPL) at commercial laundry facilities, hospitals, colleges, and lodging facilities.
Offerings	Based on current research, the Company needs to further understand and document the barriers facing this industry and barriers to specific EE technologies that may be deployed within it. Once that process is complete in 2021, the Company will be better positioned to provide holistic offerings to this market segment. Envisioned offerings pending further research include technical assistance, project management, incentives for energy efficiency measures including on premise laundry solutions, and installer and customer education sessions. For more details please see the "Changes for 2021" section below.
Implementation and Delivery	The Company will further research implementation and delivery mechanisms for this initiative in 2021 along with research into customer barriers. The Company continues to serve this market, as in previous years, with a salesperson for very large hotels and a salesperson for national or regional hotels. Small hotels may participate in Small Business offering. Customers of all sizes may participate in the numerous offerings in our Upstream lighting, water heating, and HVAC initiatives.
Customer Feedback	None to date as this initiative is not currently active, but in the research phase.
Changes for 2021	It has been difficult to find an existing vendor to serve these markets. Therefore, the Company employed an external vendor, who will continue to **research important areas of focus such as the savings and best practices for deployment of guest room energy management systems (GREMS), kitchen hood controls, and ozone**

	laundry, so that the Company can capture these opportunities without an unifying vendor. This effort will be complete by Q2 2021. The external vendor will also assist the Company in **identifying key attributes of successful future vendors and helping craft a scope of work**, as National Grid believes that a vendor can provide better customer experience and deeper savings than approaching individual technologies.
Rationale for Changes	Based on research conducted by the Company in 2020, further investigation is required on customer barriers, best practices for deployment of technologies, and program design and implementation. These will be researched in 2021.
Notes	

5.5. Strategic Energy Management Planning (SEMP)

Eligibility Criteria	The Strategic Energy Management Plan (SEMP) Initiative is available to the Company's largest C&I customers, including chain restaurants. The SEMP initiative targets customers who have the potential to go deeper with energy efficiency, have a level of in-house sophistication to make organizational changes to incorporate multi-year energy planning, and are motivated by corporate and institutional sustainability goals.
Offerings	SEMP provides customers with customized support allowing flexibility to address the energy efficiency and sustainability opportunities of the organization and its facilities in the context of the Company's self-identified business needs. Working with a SEMP gives the customer the opportunity to think long-term about their energy needs and equipment, resulting in more comprehensive savings compared to the more traditional energy efficiency programs. Where appropriate and valued by the customer, automated benchmarking will be available to help demonstrate the impact installing energy efficiency measures can have on the energy usage of the facilities. **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 has three SEMP agreements in place with colleges and universities and is currently engaged in conversations with three other college campuses in Rhode Island for SEMP agreements. The Company will continue to explore opportunities for further SEMP university customers and provide energy efficiency services to universities in Rhode Island outside the SEMP model for those universities not wishing to participate in a SEMP.
Implementation and Delivery	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, supported by an incentive structure that meets the customer's financial criteria. To support customers setting aggressive kWh and therm savings goals under SEMP, there are several items that are reviewed: • Customer's total kwh and therm usage on all accounts • Customer's percentage of energy reduction over the last 5 years through EE measures • Customer's capital project plan • High level measure identification by the Company's TA vendor for potential savings over the 3-year SEMP This offering goes far beyond energy efficiency into sustainability and branding support for the customer. The Company also engages SEMP customers with non-energy efficiency solutions, such as

	renewables, storage, electric vehicles, and distributed energy resources and technologies. The Company currently has six SEMP MOUs. Three are large university campuses, one is with a large chain restaurant, and one with a large commercial customer. In addition, a State SEMP focused on State facilities has been in place since 2016. Projects and savings vary by year. As an example of the electric savings, the 2021 annual goal for 3 colleges/universities combined is approximately 2,011 MWh and 73,334 Therms.
Customer Feedback	One customer commented that the MOU process is streamlined and easy to work with.
Changes for 2021	In 2021, the Company **will ramp up efforts to engage more customers with SEMP initiatives**. Potential customers include colleges and universities in Rhode Island not yet engaged with SEMPs, cities, industrial customers, and chain restaurants. In 2021, **educational SEMP customers will have access to specialty services from an energy solutions provider** who specializes in campus energy infrastructure from energy efficiency to mechanical/electrical infrastructure needs.
Rationale for Changes	The changes proposed for the SEMP initiative will allow for more comprehensive services for customers as well as increase participation in the SEMP initiative.
Notes	

5.6. Municipal and State Buildings SEMP

Eligibility Criteria	The Company currently has in place a three-year State SEMP. This SEMP includes municipalities, State buildings, Quasi State buildings, water and wastewater facilities, State Colleges, State Universities and public K-12 Schools.
Offerings	Following a successful joint MOU signed by the Company, OER, the Department of Administration (DOA) and the Department of Capital Asset Management and Maintenance (DCAMM) designed to integrate strategic energy planning across State and Quasi State facilities from 2016 to 2019, the State SEMP was renewed for another 4 years in 2020. The 2020-2023 MOU has a goal of achieving a 10% energy use reduction by end of 2023.

	The Company provides specific support to State and Municipal buildings through project management, implementation support, technical support and financial mechanisms to achieve energy efficiency in State, Quasi-State and municipal buildings. This is in addition to incentives available through Energy Efficiency programs. **Project/Energy Management Support:** The time and expertise required to identify, develop, and oversee these projects can be beyond the resource capacity of many towns and cities. The Company provides this support as part of the State and Municipal initiative and via a SEMP. **Implementation Support:** The Company provides support for energy efficiency project implementation via previously successful vendors. Municipalities recognize the value of this support, as it provides a trusted partner to bring the time and expertise they lack to identify, develop, and oversee complex projects. To continue to serve this sector, there are several support mechanisms in place: • URI Energy Fellows support municipalities as they learn to use Portfolio Manager as well as meet the Efficient Building Fund's energy reporting and energy management plan development requirements. National Grid also has an automated process by which customers can authorize upload of utility data onto Portfolio Manager. This system is used for benchmarking via Portfolio Manager (see section 10.3.1). • The Company supports municipal engagement in OER and programs like vendor selection, engineering support, and implementation of upgrades through the energy efficiency programs. • The Company provides energy audits to select municipal/school/wastewater customers to support energy efficiency applications. In the past few years the Company has provided approximately 50 energy audits annually. For financing in this sector, the Company will continue to offer On-Bill Repayment for electric and gas measures. Schools and municipalities will have access to the same processes that were developed for the State, including consulting for procurement and product selection, retro commissioning, incentive calculations, new

	construction support and other services to ensure successful project installation.
Implementation and Delivery	The process of participating in the State SEMP is the same as described above for other SEMPs.
Customer Feedback	The initiative has received feedback regarding some challenges with the additional of schools to the SEMP including funding, timing, and collaboration among multiple stakeholders.
Changes for 2021	The SEMP will **target a 10% reduction in energy use by the above stated facilities by 2023.** The Company will **work with multiple State agencies on exterior lighting projects.**
Rationale for Changes	By targeting an additional 10% reduction in energy use by 2023, these facilities will save money that can be used for additional energy efficiency projects in the future. The addition of K-12 public schools to the State SEMP in 2020 is one of the most efficient ways to work with this sector.
Notes	Building Operator Certification classes sponsored by National Grid in the Rhode Island and Massachusetts service areas are available to schools and many school facility managers have taken advantage of this program and follow up by actively engaging in energy efficiency solutions at their facilities.

5.7. Equipment & System Performance Optimization

Eligibility Criteria	The Equipment & Systems Performance Optimization (ESPO) Initiative is available to all C&I customers averaging greater than 2,000 building operating hours a year. The ESPO initiative offers three pathways (Low Cost Tune-Up, Targeted Systems Tuning, and Whole Building and Process Tuning) to accommodate different customer segments and building needs. The ESPO initiative is designed to optimize equipment and systems, and includes optimizing building energy controls and process system operations. The systems optimization may include retro-commissioning (RCx), operations & maintenance (O&M), and Monitoring Based Commissioning. This initiative falls under the Large Retrofit Program.
Offerings	ESPO provides three pathways for participation depending on the customer's energy efficiency opportunity, building type, and age and sophistication of existing control systems. The vendor and technical

	support team will work with the customer to select the best pathway for participation and energy savings. The three pathways are: **Low-Cost Tune-Up:** The Low-Cost Tune-Up offers technical support and prescriptive energy conservation measures to customers that have isolated items in need of standard tuning. In addition to identifying standard tuning, the technical support will help to identify easy to install efficiency measures that can be implemented by the customer's facility staff, maintenance contactors, or retro-commissioning vendors. Pre-approval for implementation is required before the customer or outside party can receive an incentive on the installation. Incentives are provided to sites where the baseline condition and the proposed upgrade are documented through a simple data input, requested in the application, which is used to determine savings at the measure level. Only selected HVAC, steam, refrigeration, and compressed air measures are eligible for prescriptive incentives. An additional performance incentive of $0.03 per kWh and $0.20 per therm is available to customers that reduce at least 2.75% of the facility's annual electric consumption and 1.5% of the facility's annual gas consumption. **Targeted Tuning:** The Targeted Tuning approach offers an in-depth investigation and tuning process for building systems and process lines. Rather than looking at the whole building, the Targeted Tuning looks for a specific process or end-use energy efficiency upgrades. A proactive approach to energy savings can be achieved through Monitoring-Based Commissioning. Monitor-Based Commissioning is similar to the Whole Building and Process Tuning approach; however this pathway assumes that identified measures will be implemented and that customer will be committed to energy monitoring and on-going energy tracking for a minimum of three years. Through the Monitor-Based Commissioning pathway, the customer installs a software package linked to the Building Management System. Monitor-Based Commissioning software uses AI and advanced analytics to constantly monitor the system and determine when a set point or system has breached an upper or lower control limit. The system identifies areas of improvement over time and alerts facilities personnel to faults in the system. The incentive for

	Monitor-Based Commissioning is $0.17/kWh and $1.20/therm on a pay-for-performance basis. **Whole Building & Process Tuning:** The Whole Building and Process Tuning offers a comprehensive, full building or process approach to retro-commissioning for customers with a functional control system in place and electric usage greater than 5,000,000 kWh annually. Manufacturing or industrial customer can also use this pathway to apply a comprehensive tuning approach for their systems. Typically, the customers facility staff is involved in the Whole Building and Process Tuning given the broader scope and longer timeline associated with the installation and commissioning. Up to $30,000 can be provided for the tuning investigation to determine energy conservation measures under this pathway. The implementation incentives are provided on a $0.17/kWh and $1.20/therm saved basis for approved energy savings. An additional performance incentive of $0.03 per kWh and $0.20 per therm is available to customers that reduce at least 2.75% of the facility's annual electric consumption and 1.5% of the facility's annual gas consumption.
Implementation and Delivery	A customer begins the process for ESPO by contacting their National Grid Sales representative. In advance of undertaking an ESPO project, as with all custom projects, account and technical representatives will work closely with the customer and their implementers to identify the appropriate pathway. If needed, a retro-commissioning consultant will be brought in to provide an investigative report, the results of which are shared with the customer. The ESPO process may also identify additional capital projects that increase energy savings and can secure additional incentives. The Company may also facilitate the transfer of information from the controls vendor to third party retro-commissioning vendors or technical assistance vendors with expertise in building controls. The Rhode Island Products and Growth team continues to work with our Massachusetts counterparts to encourage development of workforce expertise in this area.
Customer/Vendor Feedback	The Company will work with ESPO customers and vendors to solicit feedback on participation barriers, program enhancements, and incremental modifications. The feedback will be reviewed by the

	Company and improvements based on customer input will be developed and implemented during the spring and summer of 2021.
Changes for 2021	In 2021, the ESPO initiative will **include heat exchanger coil cleaning to the prescriptive low-cost tune-up measures.**
Rationale for Changes	The Company aims to increase participation in the ESPO program in 2021. The heat exchanger coil cleaning provides a relatively quick payback period that should result in greater participation and increased program awareness.
Notes	The ESPO initiative includes a number of technologies and end-uses identified in the Market Potential Study, including boilers (steam and hot water), waste energy recovery, refrigeration, scheduling and set point optimization, energy management systems, and rooftop units.

5.8. Lighting Designer Incentives (LDI)

Eligibility Criteria	LDI is offered to lighting design teams for qualifying New Construction/Major Renovations or Existing Buildings Performance Lighting projects. National Grid maintains a list of qualified Lighting Designers, as well as Engineers and Architects who have demonstrated at least 5 years of lighting design experience. National Grid markets the program to the construction and design community. Lighting designers cannot sell product for the project that they are receiving LDI. Lighting designer must have at least one of the following qualifications: • Lighting Certified (LC) – granted to those who successfully complete the NCQLP (National Council on Qualifications for the Lighting Professions) Lighting Certification Examination; • CLEP – certification from the Association of Energy Engineers (AEE); • IALD – International Association of Lighting Designers Professional Membership status; or • CLD – the IALD sponsored Certified Lighting Designer, certification.

Offerings	This incentive goes directly to the lighting design team to fund their efforts to achieve lighting energy savings while maintaining quality lighting design. LDI is a sum equal to 20% of the customer lighting incentive offered for a project, up to a maximum of $15,000 per project that goes directly to the lighting designer.
Implementation and Delivery	**Lighting designer submits LDI application for a project** LDI will be paid in two installments: National Grid will pay 50% upon pre-approval of the customer application, and 50% upon confirmation of installation, at the same time the National Grid makes the customer incentive payment. National Grid will make the payment to the lighting design team lead. The lighting design lead may choose to split the incentive with additional parties. For the first LDI installment, the lighting design team shall submit the Lighting Designer Incentive Worksheet and an invoice in the amount of 50% of the total anticipated LDI. The invoice should reference the project name. For the second LDI installment, the lighting design team shall submit a second invoice, again referencing project name.
Customer Feedback	LDI needs marketing to the customer to inform them about the benefits of hiring a lighting designer.
Changes for 2021	The Company will **create a one-page document that articulates the benefits of hiring a lighting designer** that can mailed or emailed to potential new construction or major retrofit customers.
Rationales for Changes	The Company believes that customers are more likely to participate when benefits are clearly articulated.
Notes	

5.9. Customer Owned Streetlight Equipment

Eligibility criteria	The customer owned LED streetlighting initiative is available to any city or town in Rhode Island serviced by National Grid for electric service on the Customer Owned Equipment S-05 tariff (Rate S-05), as well as fire districts, municipal water utility boards, Kent County Water Authority, Rhode Island Commerce Corporation, Narragansett Bay Commission and the State of Rhode Island.
Offerings	Incentives 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 streetlighting tariff.
Implementation and Delivery	A customer begins the process for purchasing their leased streetlights from National Grid by contacting their National Grid Community & Customer Manager. A suggested first step would be to indicate they are interested in getting an inventory of the streetlights and an estimated purchase price. This inventory is a non-binding opportunity for the customer to begin the decision-making process. If the customer opts to pursue the purchase of the streetlight assets, a notice to purchase is submitted to the Company and to the PUC as required by the legislation. A final value of the assets is calculated, and sale agreements are executed. Once the closing process is complete, the ownership of the assets is transferred from National Grid to the customer. Once the customer owns the streetlights, they can replace the older technology with LED lighting and controls. The municipal energy efficiency sales representative from National Grid will assist the customer in determining the energy savings and amount of incentive they can expect once the process is completed. The customer fills out an application form and once the lights have been installed, contacts National Grid for a post inspection. Once the post inspection is satisfactorily completed, the incentive can be mailed to the customer. Notification to the Community & Customer Manager with the completed location listing of the LED conversions is required for the billing system updates to realize any energy consumption savings.
Changes for 2021	No changes are anticipated for 2021.
Rationale for Changes	N/A
Notes	In addition to the incentives provided by the systems benefit charge mentioned above, OER provides grant funding to communities for LED street lighting. There is a $300,000 cap on the funding to individual cities and towns from OER.

5.10. Company Owned Street Light Equipment

Eligibility Criteria	Eligibility for the incentive for company owned LED streetlighting is dependent on service on the 3 unmetered streetlight tariffs, S-06, S-

	10 and S-14 with exchange of an existing roadway or post-top style, Incandescent, Mercury Vapor or High Pressure Sodium Vapor sourced luminaire to one of the Company's LED offerings. The tariffs allow LED street or post-top fixtures to be available to all customer groups.
Offerings	Incentives of $0.15 per kWh of first-year savings for qualifying LEDs are available. All company owned street and area lights are operating at a dusk-to-dawn schedule.
Implementation and Delivery	The customer contacts their Community and Customer Manager with their interest. The Company returns a billing inventory and estimated cost savings analysis for the customer to review. If the customer opts to move ahead with the lighting exchanges, a letter of intent is sent to the Community and Customer Manager. Accompanying the letter should be the billing inventory with the customer's LED options by location indicated. The Company will issue the replacement orders and install the lights. The energy efficiency sales representative will contact the customer and assist in the incentive application and payment process. About one hundred LED streetlights have been installed to date. Of the 21 towns mentioned above under customer owned, 4 of them are also considering the Company Owned option.
Changes for 2021	No changes are anticipated for 2021.
Rationale for Changes	N/A
Notes	Currently, no energy efficiency incentive is available for the Company-owned controls option as the Company does not offer adjustable controls for billing other schedules such as part-night or dimming. A majority of street lighting customers in Rhode Island have either purchased their own streetlights or indicated a preference for purchasing their streetlights. Therefore, the volume of company-owned street lighting is on the decline. As a result, the number of company-owned streetlights that would be eligible for controls if controls were made available is a small number. Additionally, the controls associated with street lighting represents only a small piece of a Company-wide Advanced Metering Infrastructure (AMI) system which would be designed to handle the core business of electric and gas metering. Although the Company is keeping a watchful eye on

	advancing technologies, the capital investment on the system will be prompted by other customers. However, the Company has a demonstration project in Schenectady NY to evaluate street lighting controls and their viability. Before networked lighting control advances at National Grid, decisions need to be made regarding selection of the control, the network provider, as well as integration into the current and/or future billing system. Like 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 replacement, the customer leasing the streetlight will receive the energy efficiency incentive directly.

Table 3 below reflects some of the similarities and differences between the two ownership options available to customers for solid state street lighting.

Table 3. Customer- Versus Company-Owned Street Lighting

Distinction	Customer-Owned	Company-Owned
LED Fixture	Customer owns the equipment and is responsible for the 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 payment for the installation of LED equipment (after satisfactory post-inspection by National Grid)	Customer receives a one-time incentive payment for the installation of LED equipment (after satisfactory post-inspection by National Grid.)
Purchase/Lease	Customer purchases the equipment	National Grid leases the equipment 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

5.11. Commercial Real Estate and Offices

Eligibility Criteria	Commercial Office Spaces
Offerings	It is unknown how COVID-19 will change this market. Due to this uncertainty, the Company is pausing the development of a commercial real estate initiative. However, a National Grid salesperson will continue to cover this market and monitor conditions in this segment.
Implementation and Delivery	The Commercial Real Estate (CRE) sector has specific challenges and barriers linked to the split incentive between building owners and tenants, and difficulty accessing decision makers. The Company serves this customer segment with specific services to engage customers, like benchmarking and finance tools, as well as specific incentives tied to office performance-based design approach that benefits both building owners and tenants. **Benchmarking** The Company provides automated benchmarking services for commercial office spaces that allows building owners to be aware of their buildings energy use and compare it with that of its peers. After a facility has been benchmarked, National Grid has various resources to help its owners achieve lower energy consumption per square foot. **Commercial Property Assessed Clean Energy (C-PACE)** C-PACE is an ideal tool for some commercial real estate owners and developers. It allows them to finance energy and related improvements in a way that is widely considered “off book” and can be passed through to renters in many types of leases. To advance the use of this unique mechanism National Grid works with the Rhode Island Infrastructure Bank (RIIB) and Sustainable Real Estate Solutions (SRS) to bring awareness to commercial building owners. The Company will ensure that both tenants and landlords statewide are aware of the wide variety of resources available to them though the Green Lease Leaders program, including one on one coaching, from the Institute of Market Transformation (IMT). Marketing pieces and “leave behinds” will be created for National Grid commercial sales professionals, landlords, and vendors. The Company will also work with IMT to host a “green lease” information session.

	The Company will continue to refine its automated benchmarking capabilities in 2021. National Grid will work with partners such as the City of Providence, Chambers of Commerce, and other entities to ensure that customers are aware of this tool as well as its benefits.
Customer Feedback	The Company has heard from long term tenants who would like to make EE improvements, but cannot do so in a way that is favorable to them due to lease terms.
Changes for 2021	It is unknown how COVID-19 will change this market. Due to this uncertainty, the Company is pausing the development of a commercial real estate initiative. However, a National Grid salesperson will continue to cover this market and monitor conditions in this segment.
Rationale for Changes	Market uncertainty due to COVID-19.
Notes	

5.12. Extended Care Facilities (Nursing Homes/Assisted Living)

Eligibility Criteria	The extended care market sector includes nursing homes, assisted living facilities, and rehabilitation facilities.
Offerings	Offering for this Initiative include lighting, HVAC improvements (including heat pumps), envelope improvements, energy management systems, energy efficient laundry systems, and Combined Heat and Power (CHP). Commercial Property Assessed Clean Energy (C-PACE) can be used as a financing tool. C –PACE, further defined in section 9.6, allows customers access to low cost private capital for terms that greatly exceed most conventional business loans. It also allows the customer to capitalize all costs related to the project. This means that the Company now has a potential solution to one of the barriers to moving forward with deeper and broader efficiency measures in this segment.
Implementation and Delivery	Interested customers contact the sales representative who handles energy efficiency sales for medium sized businesses.
Customer Feedback	The vast majority of these facilities either did not have the resources or did not want to prioritize the resources to investigate energy efficiency opportunities, even with a generous cost share, let alone

	act on them. Consequently, this market segment presents challenges to participate in comprehensive energy efficiency.
Changes for 2021	As the majority of these facilities are small businesses, the Company will **work with the small business vendor and current salesperson to refine the initiative approach in 2021.**
Rationale for Changes	See customer feedback above.
Notes	

5.13. Farm/Agriculture

Eligibility Criteria	The Farm and Agricultural Initiative is available to any farm or agricultural National Grid customers within the state of Rhode Island regardless of energy source including delivered fuels. National Grid will cover electric and natural gas energy efficiency incentives in accordance with the customer's eligibility and the program criteria. These energy conservation measures will be installed with prior approval of landlord, where appropriate.
Offerings	Lighting, HVAC improvements (including heat pumps), envelope improvements (weatherization, air sealing, insulation), equipment upgrades including refrigeration, pumps and motors, and ventilation. Now Commercial Property Assessed Clean Energy (C-PACE) can be used as a financing tool. C –PACE, further defined in the "Affordability and Financing" section below, allows customers in participating communities to access low-cost private capital for terms that greatly exceed most conventional business loans. It also allows the customer to capitalize all costs related to the project. The Company recognizes that financial assistance can help small businesses, including agricultural ones, to move forward with energy efficiency projects and is committed to helping them access affordable options. In addition, farmers may be eligible to participate in the Rhode Island Agricultural Energy Program grant.[3]

[3] http://www.rifarmenergy.org/ri-ag-ep.htm

Implementation and Delivery	National Grid engages with customers through targeted outreach, while also providing additional information via the Office of Energy Resources website.[4] By way of this initiative, participating customers will receive a no-cost, no-obligation energy audit in which a qualified vendor will visit the farm, perform an energy audit and provide the customer with a written list of recommended measures tailored to the customer's situation, including equipment focused on agriculture. As of February 2020, twenty-six customers have either received or are pending an energy audits, with twenty-five of those customers having installed energy conservation measures.
Customer Feedback	Incentives have been critical to get customers to move forward with energy efficiency measures. The process took a long time from audit to installation. Customer awareness could be improved. Feedback indicates customers lack awareness as to what qualifies for energy conservation measure incentives. However, those who have utilized incentives have seen significant savings and benefits to their operations.
Changes for 2021	In 2021, the Company will **explore simplifying the initiative for customers with multiple meter types**, including a mix of residential and commercial accounts.
Rationale for Changes	The agriculture segment of the market has not embraced participation at the same levels as others. Therefore, the Company is working to simplify participation for customers while continuing targeted outreach and leveraging online resources to increase participation. Increasing participation will ensure equitable access to programs and incentives, which is a goal for both the Company and stakeholders.
Notes	

[4] http://www.energy.ri.gov/policies-programs/programs-incentives/feep.php

5.14. Combined Heat and Power Initiative

Eligibility Criteria	To qualify for a Combined Heat and Power (CHP) energy efficiency incentive, a proposed project, no matter the size, 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, (ii) using waste energy or waste heat to generate electricity, or (iii) electric load following and meeting a total system efficiency greater than 55%. • Both new construction and retrofit installations are eligible; in either case, the baseline system must be documented. • The overall minimum total system efficiency of the proposed CHP units must be 55% or greater.[5] System efficiency is calculated as Annual Useful Energy/Annual Natural Gas Input where *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, or back pressure turbine and the facility will capture waste heat for use in the facility. • Any size wasted energy systems and back pressure or extraction turbines can qualify. While it is expected that most of these applications will be retrofit, both new construction and retrofit installations are eligible; in either case, the baseline system must be carefully documented. • The project must pass cost effectiveness screening.

[5] 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.

	These systems are designed to take advantage of existing on-site wasted energy, rejected heat, opportunity fuels, renewable natural gas or inefficient processes. Therefore, there is no minimum total system efficiency requirement.
Offerings	If a project has been shown to be cost effective, presents no capacity or reliability concerns, and has met the required eligibility criteria, it will be eligible for a non-variable incentive. An additional incentive tier will be available to CHP projects where the host customer also commits to implementing energy efficiency measures representing at least five percent of the site energy use or the maximum load reduction identified in the Technical Assistance Study, whichever is less.[6] A customer may be treated as having made this commitment to energy efficiency if they have made investments to achieve similar load reductions through energy efficiency within the previous five years. Please use the table below to determine the non-variable incentive levels available for CHP project.

Table 4. Determination of Non-Variable Incentive Level for CHP Projects

Wasted energy, back pressure turbines, and extraction turbines	$900 per net kW
CHP with total system efficiency ≥55% - <60%	$900 per net kW
CHP with total system efficiency ≥55% - <60% with customer implementing energy efficiency measure equal to 5% of site energy or maximum load reduction	$1,125 per net kW
CHP that utilized between 25% -49% opportunity fuels, renewable natural gas, or biogas as a fuel source	$1,225 per net kW

[6] 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.

CHP with total system efficiency ≥60%	$1000 per net kW
CHP that utilizes opportunity fuels, renewable natural gas, or biogas as the primary fuel source	$1,250 per net kW
CHP with total system efficiency ≥60% with customer implementing energy efficiency measure equal to 5% of site energy or maximum load reduction	$1,250 per net kW

The CHP system costs must include: all system, auxiliary, and interconnection costs, and CHP maintenance. If the CHP system is receiving a tax credit or other financial arrangement that reduces the cost of the CHP project to the customer without distributing that cost reduction as an additional cost to other electric or gas ratepayers, it may 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. In the event the incentive is greater than 70% of the total project cost, the incentive amount will be reduced to an amount equal to or less than 70%. A minimum of 20% of the energy efficiency incentive payment will be held until commissioning is completed.

An additional optimal operations and maintenance energy efficiency incentive capped at $20/kW-year ($1.66/kW-month) and $50/kW-year ($4.16/kW-month) for systems utilizing biogas will be offered as part of the incentive package for any project with a net output greater than one MW for a period of up to 10 years. No payments will be made until the unit is in operation and provides demonstrated load reduction. The optimal operations and maintenance energy efficiency incentive will be made semiannually 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. The optimal operations and maintenance energy efficiency incentive provides the customer with a post-commissioning incentive for maintaining or increasing the total system efficiency of the CHP system. This helps ensure the system is operating efficiently and that the system capacity savings are in-line with those bid into the ISO-NE Forward Capacity Market. The customer will 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.
Implementation and Delivery	**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 that are the 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. **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. 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 TA vendors 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 (http://ngrid.com/ri-chp) 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 customer plant operator training depending on the size and complexity of the system and whether or not the management of the system will be outsourced, and providing easier customer access to CHP unit performance data. **Installation of Incremental or Additional Energy Efficiency Measures for Customers who have Previously Installed CHP** The Company will individually review the installation of proposed incremental energy efficiency measures for customers who have previously installed CHP on site or who are adding additional energy efficiency equipment that might affect the performance of an existing CHP unit. The Company will carefully categorize and protect the benefits attributed to previously installed CHP projects, while at the same time foster any additional cost-effective energy efficiency measures that further reduce total energy use. There are two types of project categories. The first category is "CHP Optimization" and involves measures which are installed with the purpose of increasing the output or operating efficiency of the existing CHP or other distributed generation (DG) unit; for example, the addition of combustion air precooling on a gas turbine CHP unit. In order to maintain compliance with ISO-NE's FCM rules, such projects will be tracked in the FCM, if applicable, as incremental output of the associated DG facilities. The second category is "Incremental EE", which includes "traditional" energy efficiency measures installed with the intent of reducing energy consumption in sites that have previously installed CHP. These measures may or may not affect CHP performance and output. For locations where an existing CHP unit covers a large percentage of the total load at the facility, additional energy efficiency savings measures installed may result in lowering the output of the CHP system instead of a load reduction on the Company's electric grid. Therefore, to assess savings that can be claimed by the energy efficiency programs, hourly load mapping may be required to accurately assess the net savings on the Company's electric and gas

	distribution systems, which will be assessed at the Company's electric and/or gas revenue meters at the customer's site. In cases where a typically electric measure (like lighting) reduces the electric load enough to require reducing the CHP output, gas savings may result from a normally electrical energy efficiency measure and could be claimed in the Gas utility DSM programs **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 • A high-level analysis of the fuel resources needed for the project and any actual or anticipated fuel capacity constraints and/or actual or anticipated fuel reliability issues 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 during preliminary scoping, National Grid will offer to co-fund a TA study of CHP with the customer. The TA study will be performed by an independent, qualified engineering firm. This study will assess thermal and electric loads, propose an appropriate CHP size and technology, compile a budget cost estimate, and identify potential barriers to the technology, etc. National Grid typically funds 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 CHP given the

	proposed nameplate rating, the net CHP output after subtracting parasitic loads associated with the CHP, projected availability based on anticipated site-specific operating characteristics, performance data on other similar units, and a greenhouse gas analysis that estimates the change in greenhouse gas emissions expected from the project and a statement that informs the customer of the state goal to reduce greenhouse gas emissions by 80% below the 1990 levels, by 2050. (On-peak kW reduction = Net Output x Availability x % Loaded.) This kW load reduction should be used in the benefit-cost screening. As indicated in the offering section, a larger incentive is available for CHP projects that include the implementation of energy efficiency measures at the host facility. If the customer wants to meet a higher tiered incentive and did not previously qualify for that higher tier, the company could include another review. This review would propose measures to fulfill that requirement with new 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. **Cost Effectiveness** The screening for cost effectiveness specific to CHP is included in the Rhode Island Test included as Attachment 4. However, given the Division's concerns over the applicability in all circumstances of what the Division characterizes as generic economic benefit assumptions identified in the CHP economic development benefit study underpinning theses adders, the Company will provide two scenarios of the benefit cost screening for CHP systems with a net output of one MW or greater: one test that includes the economic benefits adder within the Rhode Island Test, and one test that excludes the economic benefits adder. If the scenario of the screening test for the project would not pass without the economic benefits included, the Company will provide a written and well-supported justification explaining why the economic benefits are reasonably likely to be obtained. During the project notification process described elsewhere in this section for projects of one MW or greater, if any party who has intervened in the notification dockets disagrees with the Company's justification, the matter will be set for hearing at the Commission for resolution.

	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: • 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 greater than one MW will require electric, thermal and gas metering for commissioning and monitoring of system efficiencies. • 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 through the first planned major overhaul of the CHP unit after post installation commissioning. On-going O&M contracts for a minimum of 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. • 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. **Qualification** The cost of the project will be provided by a design/build or general contractor experienced with CHP projects and revised as necessary. **Options for a 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.
	
	Attribution of CHP Energy Savings to the Company
	
	For CHP projects one MW or greater in size that meet the eligibility criteria, 100% of the project savings shall be attributed to the energy efficiency programs. For CHP projects smaller than 35 kW, the Company shall use the latest net to gross adjustments determined by impact evaluations conducted on the RI CHP programs. These evaluations shall be conducted at least once every five years.
	
	Notification Process
	
	The Company shall inform the DPUC, OER, and EERMC of any CHP project with a net output of one MW or greater (where net is the nameplate MW output minus CHP auxiliary kW). The notification shall occur after the cost benefit screening and before the offer letter is presented to the customer. For CHP projects with a net output of one MW or greater, the Company shall submit the following documents for review by the Division:
	
	• Documentation demonstrating that the project would not move forward without energy efficiency technical assistance and/or incentives. The documentation shall justify its finding with the following evidence:
	  • A letter signed by a senior executive or site operations manager stating that the project would not move forward without the energy efficiency technical assistance and incentive;
	  • Documentation from the customer on all relevant leases, agreements or commitments related to the CHP system or incentive offer;
	  • Estimated project budget.
	• A complete benefit cost analysis for the CHP project using the Rhode Island Test, as well as application of this test applying sensitivities related to the removal of economic benefits

	• A report including a natural gas capacity analysis that addresses the impact of the proposed project on gas reliability; the potential cost of any necessary incremental gas capacity and distribution system reinforcements; and the possible acceleration of the date by which new pipeline capacity would be needed for the relevant area. For any proposed CHP project greater than one MW: • The Company will submit a project description to the Division, providing all the pertinent details relating to the project. • The Division may submit information requests to the Company at any time after receipt of the project description. The Division may also submit follow up data requests, as needed. • The Company shall respond to all information requests as soon as reasonably possible, but no later than fourteen days from receipt of information requests, unless the Division grants an extension. • The Division will make all reasonable efforts to communicate decisions around the provision of a notification of support within thirty days of the receipt of the last set of information request responses received from the Company. • To the extent that additional review time is required, the Division will provide notification to the Company. • If at the end of fifty days from the date the Company provided the project description to the Division, the Division has not provided to the Company its opinion of support or opposition to the project, the Company retains the right to make a filing with the Commission seeking approval of the CHP incentive. The Division retains its right to take any position on the project it deems appropriate and shall not be prejudiced by the fact that it did not provide an opinion to the Company within the fifty day period. Even if the Division provides its opinion to the Commission that the Division supports the CHP project, the Company must file a notification with the Commission, setting forth the pertinent facts relating to the project. If (i) the Commission takes no action within thirty days and (ii) the Division or any other party has not objected to the proposed project, the

	project will be deemed approved. If the Division or any other party objects, the Commission will set the matter for hearing.
Customer/ Vendor Feedback	Vendors and customers provided feedback in advance of the 2020 Rhode Island Annual CHP Public Meeting. The vendors and customer noted that the incentive levels and interconnection remain the most significant barriers to CHP adoption. Customers and vendors also remarked on the financial and interconnection challenges associated with smaller CHP systems. The Company is currently exploring options for a prescriptive pathway for micro-CHP systems. This process would simplify the interconnection process and expedite the installation time for smaller CHP systems.
Participation and Savings	Due to 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. For 2020, the Company achieved 630kW of installed capacity, corresponding to approximately 4,089 MWh of savings. As of August 2020, the Company has knowledge of the following, estimated pipeline of CHP projects in Rhode Island (see Table 5) that have initiated a Technical Assistance Study and are expected to leverage energy efficiency incentives. The Company commits to updating this pipeline table in each annual Energy Efficiency Plan and reconciliation filing to the PUC going forward. Direct notification shall be sent to the Division of Public Utilities & Carries, the Office of Energy Resources, and the Energy Efficiency and Resource Management Council via email whenever a CHP project with a net output of one MW or greater is added, removed, or updated after the Technical Assistance Study and before the offer letter to the customer. *Table 5. Pipeline of RI CHP Projects with TA Study Initiated*

Customer Name or Company Name*		N/A
Approximate Size of CHP (kW and Annual MWh)		600 kW 2,736 Annual MWh
	Feeder	53-126W42

<table>
<tr><td></td><td>
<table>
<tr><td rowspan="2">Location Information</td><td>Substation</td><td>Washington Substation</td></tr>
<tr><td>Gas Line ID</td><td>153-Providence, RI</td></tr>
<tr><td colspan="2">Current Status (Scoping, Study, Under Construction, Post-Inspection or Commissioning)</td><td>Technical Assistance Study</td></tr>
<tr><td colspan="2">Estimated Year(s) in which the Company will claim energy savings</td><td>2021 and 2022</td></tr>
</table>
*Customers and/or Companies may opt-out of disclosing their names in this table. If a customer or company has opted-out their names have been redacted in the table above. The Company will provide a confidential pipeline table without redacted names to the PUC, DPUC, and/or OER, if requested.
</td></tr>
<tr><td>Changes for 2021</td><td>The Company will provide an additional incentive tier to CHP systems that leverage biogas as a fuel source. The Company will also add an Optimal Operation and Maintenance Incentive for CHP systems that utilize biogas as a fuel source.</td></tr>
<tr><td>Rationale for Changes</td><td>The proposed changes to the 2021 CHP Initiative are intended to reduce the additional economic barriers associated with the installation and operation and maintenance of biogas CHP systems.</td></tr>
<tr><td>Notes</td><td>The Company has established working groups to research and assess the barriers and opportunities for CHP at wastewater treatment facilities and data centers.</td></tr>
</table>

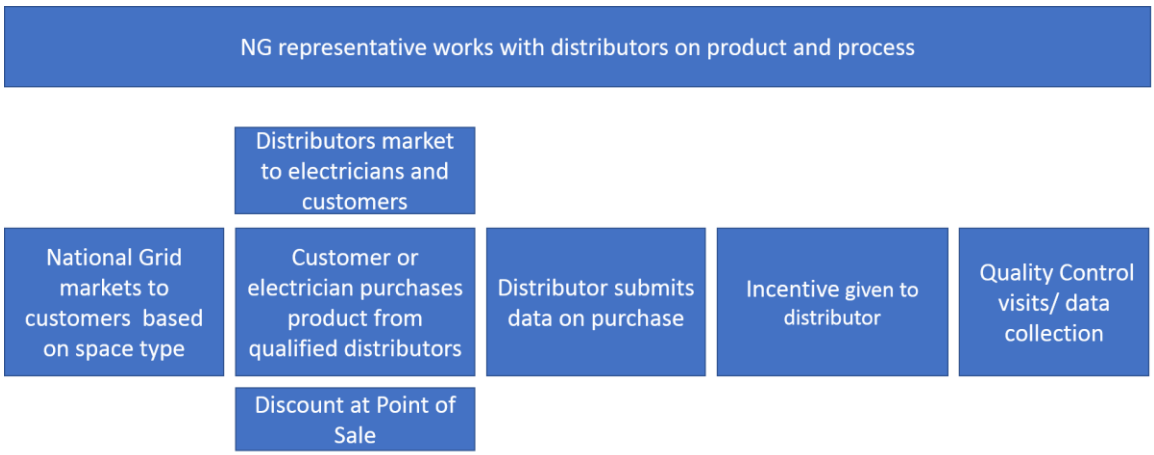
5.15. Products Offered Through "Upstream"

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 after the sales transaction has been made. 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. It is also often a more cost-efficient way to deliver savings to the program.

5.15.1.Upstream Lighting

Eligibility Criteria	The Upstream Lighting initiative is available to all commercial customers.
Offerings	Discounted luminaires, luminaires with controls, lamps, and controls at the point of sale at qualified distributors.
Implementation and Delivery	National Grid targets marketing to relevant customers and works in collaboration with qualified distributors, who also conduct marketing. Distributors sell products directly to consumers or relevant intermediaries (e.g. electricians) and provide discounts at the point of sale. The distributor then submits data on the purchase and the Company pays the incentive to the distributor and conducts quality control visits. See Figure 7 for more detail.
Customer Feedback	The Company's sales team and program managers regularly talk with lighting wholesalers who have direct contact with the customers who purchase equipment and are best positioned to relay customer expectations and feedback. Feedback from these wholesalers is often as important to program success and design as direct end-customer feedback because they strongly influence customer lighting choices.
Changes for 2021	2021 will feature **increased incentive support for Luminaire Level Lighting Controls (LLLCs).** The Company will **increase marketing of all lighting products to small businesses** who consume less than 25,000 kWh per year.
Rationale for Changes	Market transformation, increased savings, drive more participation among ultra-small small business
Notes	The Company will continue to investigate ways to increase stocking of luminaires with controls. Information will be collected through the Upstream vendor as well as two anonymous surveys developed by National Grid staff as well as the appropriate members of the EERMC Consultant team.

Figure 7. Implementation and Delivery Process for Upstream Lighting



5.15.2. Upstream HVAC

Eligibility Criteria	The Upstream HVAC initiative is available to all commercial customers.
Offerings	Discounted premium efficiency HVAC equipment and controls at the point of sale at qualified distributors including air-cooled air conditioning and heat pumps systems, water-cooled air conditioning and heat pump systems, variable refrigerant flow systems, as well as dual enthalpy economizer controls and electronically commutated motor (ECM) circulator pumps for hydronic heating or service hot water applications.
Implementation and Delivery	All upstream products follow a similar implementation and delivery process shown in Figure 7. National Grid targets marketing to relevant customers and works in collaboration with qualified distributors, who also conduct marketing. Distributors sell products directly to consumers or relevant intermediaries (e.g. electricians) and provide discounts at the point of sale. The distributor then submits data on the purchase and the Company pays the incentive to the distributor and conducts quality control visits.
Customer Feedback	The Company's sales team and program managers regularly talk with partnering distributors who have direct contact with the plumbing, HVAC and heating contractors, and occasionally end customers who purchase equipment. Distributors provide feedback from these key distribution chain players. Plumbing, HVAC and heating contractors have direct contact with customers and are best positioned to relay

	customer expectations and feedback. Feedback from these contractors is often as important to program success and design as direct end-customer feedback because contractors strongly influence customer equipment choices.
Changes for 2021	Centrally Ducted Heat Pumps <5.4 tons (Ductless Mini or Multi Split Air Source) will move to the downstream pathway to align with the Massachusetts PA's.
Rationale for Changes	Alignment with Massachusetts program.
Notes	The savings of the upstream HVAC products will be calculated from new construction baselines, not retrofit.

5.15.3. Upstream Gas

Eligibility Criteria	The Upstream HVAC initiative is available to all commercial customers.
Offerings	Discounted premium efficiency water heating equipment at the point of sale at qualified distributors. The 2021 offering will include water heaters (indirect and on-demand), water heating boilers, and condominium water heaters.
Implementation and Delivery	All upstream products follow a similar implementation and delivery process shown in Figure 7. National Grid targets marketing to relevant customers and works in collaboration with qualified distributors, who also conduct marketing. Distributors sell products directly to consumers or relevant intermediaries (e.g. electricians) and provide discounts at the point of sale. The distributor then submits data on the purchase and the Company pays the incentive to the distributor and conducts quality control visits.
Customer Feedback	The Company's sales team and program managers regularly talk with partnering distributors who have direct contact with the plumbing, HVAC and heating contractors, and occasionally end customers who purchase equipment. Distributors provide feedback from these key distribution chain players. Plumbing, HVAC and heating contractors have direct contact with customers and are best positioned to relay customer expectations and feedback. Feedback from these contractors is often as important to program success and design as

	direct end-customer feedback because contractors strongly influence customer equipment choices.
Changes for 2021	No changes are anticipated for 2021.
Rationale for Changes	N/A
Notes	

5.15.4. Upstream Kitchen Equipment (Electric and Gas)

Eligibility Criteria	The Upstream Kitchen Equipment initiative is available to all commercial customers.
Offerings	Discounted premium efficiency electric and gas kitchen equipment at the point of sale at qualified distributors. National Grid currently offers more than 9 different types of energy efficient cooking equipment across both fuels.
Implementation and Delivery	All upstream products follow a similar implementation and delivery process shown in Figure 7. National Grid targets marketing to relevant customers and works in collaboration with qualified distributors, who also conduct marketing. Distributors sell products directly to consumers or relevant intermediaries (e.g. electricians) and provide discounts at the point of sale. The distributor then submits data on the purchase and the Company pays the incentive to the distributor and conducts quality control visits.
Customer Feedback	The Company's sales team and program managers regularly talk with kitchen equipment wholesalers who have direct contact with the customers who purchase equipment and are best positioned to relay customer expectations and feedback. Feedback from these wholesalers is often as important to program success and design as direct end-customer feedback because they strongly influence customer equipment choices. Anecdotal feedback indicates the program is easy to participate in and wholesalers are enthusiastic about how the program both saves customers money and generates additional sales/profit for them. More than one wholesaler reported that the increased incentives offered by the Company during the COVID-19 pandemic helped them help their customers during this difficult time and was an important mechanism to

	incentivize customer spending and generate equipment sales. As one wholesaler recounted, "I am beyond grateful for the increased incentives that were offered towards the later part of this COVID mess. It was one of the only saving graces we had to try and convince customers to start spending money they didn't have with all the restrictions the Governor placed on operating their restaurants and bars. I truly hope this program is continued. We have had great success with it." In a recent survey, some wholesalers reported that COVID-19 had not impacted their ability to make high-efficiency sales or resulted in a change to the types of customers they make sales to.
Changes for 2021	No changes are anticipated for 2021.
Rationale for Changes	N/A
Notes	

5.16. Telecommunications Initiative

Eligibility Criteria	This is initiative is designed to serve mobile, fiber optic, and cable data companies and their associated infrastructure.
Offerings	Technical assistance, project management, and incentives
Implementation and Delivery	The Company is still in discussions with the vendor on exactly how the initiative will be delivered. Based on current deployments by this vendor in other locations it will closely resemble the Energy Smart Grocer Program.
Customer Feedback	Not applicable as this is a new initiative.
Changes for 2021	Not applicable as this is a new initiative.
Rationale for Changes	Potential for increased savings predominately from non-lighting as highlighted in the Market Potential Study. Additionally, the Company believes that this is an equitable use of ratepayer funds as this market has not been served in previous years.
Notes	

6. Small Business Direct Install Program

Eligibility Criteria	Commercial customers who have less than 1,000,000 kWh in annual usage may participate in the Small Business Direct Install Program. K-12 schools, national and regional chain restaurants, and small grocery stores who consume less than 1,000,000 kWh per year are excluded from this program as they are served through other pathways or initiatives.
Offerings	The Small Business Program begins with a no-cost site assessment conducted by a Small Business Energy Specialist to understand the customer's energy-related needs and goals. The assessment keys in on energy efficiency measures such as lighting systems and controls, cooler/refrigeration control, water saving measures, HVAC controls, motor controls, weatherization/insulation, and custom measures. Turn-key install and OBR is offered to support the adoption of the recommended measures to the customer. A Customer Directed Option (CDO) is also available. In this pathway, customers are able to use their own electrician to install measures while the Small Business program vendor processes and submits all necessary paperwork to National Grid.
Implementation and Delivery	A customer begins the process for a Small Business energy assessment by either calling, emailing, or using an online form to express interest in the program. The customer is connected to a dedicated, internal Small Business program staff to learn more details about the process and the next steps. The assessment is scheduled with the customer, and the Energy Specialist meets the customer at the scheduled time. The Energy Specialist performs the assessment, identifies strategies to pursue opportunities, reviews design considerations with the customer, and incorporates this detail into a proposal describing appropriate energy efficiency measures. The proposal reflects the installed costs, the expected energy savings, and the applicable program incentives. Once the customer decides to proceed, the Energy Specialist hands off the project to a Project Coordinator who works with the customer to set a convenient installation schedule that will not interrupt their business. After installation, a certificate of install is signed off on by the customer indicating their satisfaction with the work provided. There is dedicated support staff to address any post-install

	issues that may arise. This support structure is designed to smoothly execute projects and allow the customers to remain focused on their daily tasks.
Customer/Vendor Feedback	The Company's vendor regularly collects insights and feedback from customers. National Grid's sales team and program managers regularly check in with vendors to capture this feedback Outgoing direct mail and phone outreach have increased in volume and the program vendor is employing more direct canvassing from its field staff to meet its yearly goals. Consequently, the cost of acquiring a customer is increasing.
Changes for 2021	In 2021, there will be **increased focus on non-lighting opportunities, such as hood controls and other HVAC controls**. The program will save energy and prepare customers for the future by substantially **increasing the amount of gas weatherization provided to small businesses.** The program will **work to achieve its goal of 30% percent of installed luminaires and retrofit kits with integrated controls**. In previous years, lighting controls have represented approximately two-to-three percent of the program's electric savings. Frequently, very small businesses (under 25,000 kWh consumed per year) do not need an energy audit to realize that they can make energy improvements to their spaces. To that end, in 2021 National Grid will **run segmented marketing campaigns** directed at these customers and local electricians to market the various Upstream energy efficiency products that can be purchased at a discount to decrease energy.
Rationale for Changes	Capture more non-lighting savings per the Market Potential Study, provide more savings and benefits to SMB customers during a financial downturn, and prepare for the future of heating.
Proposed Upcoming Evaluations	There are no scheduled evaluations, as recently completed evaluations continue to inform the program. A 2017 Impact Evaluation of Small Business Electric Installations was completed in March 2020. The study updated electric non-lighting impact factors for the Small Business initiative. A 2016 study of small business lighting (Rhode Island Commercial and Industrial Small Business Initiative Impact Evaluation) was completed in 2019. At the time of filing, the Company had just

	completed a 2019 Rhode Island Free-ridership and Spillover (FRSO) Study. FRSO is updated for the whole small business program, both electric and gas, as part of this study.

Small Business Direct Install – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Passive Demand Reduction kW (Electric)	Total Net Lifetime MMBtu (Electric Gas, Oil, Propane)	Budget ($000)	Participation
Electric	105,134	9,696	1,134	272,100	8,884	545

Small Business Direct Install – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	48,861	4,886	333	183

7. Connected Solutions (Active Demand Response)

Eligibility Criteria	Large Commercial and Industrial customers with interval meters.
Offerings	The Company implemented an active demand reduction program in 2019 based on demonstrations done in 2017 and 2018. Under this program, customers agree to reduce their electric use during the system peak. Customers participating in the demand response (DR) program are free to curtail their energy use by any means possible, as this program is technology agnostic. **Targeted Dispatch** *(One to eight DR events per summer)* This option calls on customers to curtail their electricity use or discharge energy from generators only a few times per summer. Typical technologies or strategies used to curtail load include building management systems to control HVAC systems, lighting control systems, and manual or automated changes to manufacturing processes. The customer's performance is calculated using either the Company's electric meter where available (typically G-32 customers) or third party metering (typically G-02 customers). Please refer to the program materials available on the Targeted Dispatch page of the Company website for a detailed explanation of the baseline method used and examples. This initiative uses Curtailment Service Providers (CSPs) to assess curtailment opportunities at a facility and deliver curtailment services to enrolled customers. CSPs identify curtailment opportunities for deployment under the Company's initiative, as well as demand charge and Installed Capacity (ICAP) tag[7] management opportunities and present a complete curtailment proposal to the customer. The demand charge and ICAP tag management provide opportunities for direct bill savings to customers. Customers and CSPs respond to dispatch signals or criteria specified by the Company. Events are called the day before curtailment is needed. The core model remains focused on reducing demand during summer

[7] Installed Capacity Tag is a capacity payment that is set for a customer by using their peak demand during the peak day/hour on the NEPOOL grid

<table>
<tr><td></td><td>peak events, typically targeting fewer than twenty hours per summer. The program is structured to avoid interfering with the ISO-NE programs or penalizing customers for participating in both programs.

This Energy Efficiency Plan is being coordinated with the SRP Plan to ensure that the customer offerings are cohesive, not duplicative, and a comprehensive marketing plan is being implemented. This coordination between SRP, NWAs, and DR is detailed in the 2021-2023 SRP Plan sections on NWAs in System Planning and on Coordination with Energy Efficiency.

Daily Dispatch *(40 to 60 DR events per summer)*

This option calls on customers to curtail their energy use or discharge energy many more times per summer than the Targeted Dispatch. Because of the number of dispatches, customers typically look for an automated participation path with a technology that does not disrupt their comfort or business, such as battery or thermal storage.</td></tr>
<tr><td>Implementation and Delivery</td><td>**Targeted Dispatch** *(One to eight DR events per summer)*
The estimated performance for Targeted Dispatch is lower than expected given the number of enrollments. Consequently, the Company proposed increasing the goal to 37MW-performed for 2021.

Table 6. Targeted Dispatch Participation
<table>
<tr><th></th><th colspan="3">Historic Numbers</th><th>Estimated Number</th><th>Proposed Number</th></tr>
<tr><th></th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th></tr>
<tr><td>**Average MW of Curtailment over all events**</td><td>11</td><td>27</td><td>32</td><td>33
(vs. 35 planned)</td><td>37
(12% increase)</td></tr>
</table>
Please refer to the program materials available on the Targeted Dispatch page of the Company website for a detailed explanation of the baseline method used and examples.
Customers have the option to receive their incentives directly from the Company, or have the Company send the incentive to the customer’s curtailment service provider. Please see the program materials and the customer application available on the Targeted Dispatch page of the Company website for more details.</td></tr>
</table>

<table>
<tr><td></td><td>

Daily Dispatch (*40 to 60 DR events per summer)*

The estimated performance for Daily Dispatch is lower than expected given the number of enrollments. Consequently, the Company proposed increasing the goal to 4 MW-performed for 2020.

Table 7. Daily Dispatch Participation

<table>
<tr><th></th><th>Historic Numbers</th><th>Estimated Number</th><th>Proposed Number</th></tr>
<tr><td></td><td>2019</td><td>2020</td><td>2021</td></tr>
<tr><td>Average MW of Curtailment over all events</td><td>0</td><td>3
(vs. 0 planned)</td><td>4
(25% increase)</td></tr>
</table>

Please refer to the program materials available on the Daily Dispatch page of the Company website for a detailed explanation of the baseline method used and examples.

Customers have the option to receive their incentives directly from the Company, or have the Company send the incentive to the customer's curtailment service provider. Please see the program materials and the customer application available on the Daily Dispatch page of the Company website for more details.

</td></tr>
<tr><td>Customer Feedback</td><td>As many customers did not allowing onsite visits from March through June 2020 due to COVID-19, curtailment plans for the summer 2020 demand response performance season were created based on facility manager interviews rather than on direct customer feedback.</td></tr>
<tr><td>Changes for 2021</td><td>

At this time, there are no anticipated program changes related to Targeted or Daily Dispatch for 2021 based on performance projections from currently available data. Ongoing evaluation of summer 2020 performance may generate opportunities to improve the program in 2021, however results are not expected until shortly after the filing of this Plan. The Company will share any proposed program changes resulting from the evaluation with stakeholders prior to implementing changes. The design of the Energy Storage Demand Response Initiative remains consistent with the program design proposed in 2019.

Coordination with other Company Energy Storage programs

The Company is developing two Energy Storage Initiatives in 2021, as detailed in Docket Nos. 4770/4780 Amended Settlement Agreement:

- One behind-the-meter (BTM) system co-located with a DCFC site, which will consist of an approximate 250 kW two-hour

</td></tr>
</table>

	energy storage system, supporting approximately two to six DCFC ports. • One front-of-the-meter (FTM) storage system, which will consist of an approximate 500 kW three-hour energy storage system for the primary purpose of realizing distribution system value, with the exact storage size and capacity to be determined by system need and location. The Docket Nos. 4770/4780 demonstrations primarily focused on testing grid-connected systems to mitigate the load impact associated with EV charging, whereas the Energy Storage Initiative in the 2019 Plan was a storage-enabled DR program focused on incentivizing the use of customer-owned behind-the-meter (BTM) storage to shift peak load at traditional end-use customer facilities. These efforts are separate from the Energy Storage Demand Response Initiatives specifically targeted to facilitating BTM storage to be used for DR. The Company's intent is to test storage use cases in both FTM and BTM in order to identify all applications that are beneficial to customers and to the grid as a whole. A secondary benefit of testing both categories of storage applications is that it will help spur the development of a robust storage market in Rhode Island, where the contributing parties may differ between large grid connected applications and smaller BTM applications.
Rationale for Changes	The Company's other efforts related to storage are complementary to the ConnectedSolutions program's goal of reducing electric use during system peaks. Routine coordination with other Company programs helps leverage opportunities for further savings while minimizing duplication of efforts that could otherwise confuse customers.

ConnectedSolutions – Electric Program Goals, Metrics, Budgets, Participation for 2021

Fuel	Lifetime MWh (Electric)	Annual MWh (Electric)	Annual Active Demand Reduction kW (Electric)	Budget ($000)	Participation
Electric	0	0	33,600	2990.1	180

8. C&I Multifamily Program

Eligibility Criteria	See Attachment 1, Section 3, for eligibility information. In addition to criteria listed in Attachment 1, Section 3, the multifamily program provides joint residential and commercial energy services to condominiums and apartment complexes for energy efficiency upgrades with no cost audits. The multifamily C&I program also serves customers like non-profits, group homes, and houses of worship that traditionally do not fit within the predefined program structure.
Offerings	See Attachment 1, Section 3, for offerings. In addition to what is listed in Attachment 1, Section 3, the C&I multifamily program specifically offers incentives for master metered gas measures that typically include boiler upgrades, reset controls, and insulation and air sealing. The remaining areas are addressed through residential incentives via a common point of contact such as a property manager or building owner to comprehensively service the facility.
Implementation and Delivery	See Attachment 1, Section 3, for implementation and delivery. In addition to what is listed in Attachment 1, Section 3, note that the program coordinates with the Residential New Construction Program, Multifamily Programs, and the Small Business Program.
Customer Feedback	See Attachment 1, Section 3, for customer feedback.
Changes for 2021	See Attachment 1, Section 3, for program changes.
Rationale for Changes	See Attachment 1, Section 3, for rationale.
Proposed Upcoming Evaluations	See Attachment 1, Section 3, for upcoming evaluations.
Notes	

C&I Multifamily Program – Gas Program Goals, Metrics, Budgets, Participation for 2021

	Lifetime MMBtu (Gas)	Annual MMBtu (Gas)	Budget ($000)	Participation
Gas	141,869	9,444	953	729

9. Finance as an Enabling Strategy

It is well documented that many customers face challenges in bringing energy efficiency projects to fruition. These may include structural limitations within a business, information overload, cultural resistance within companies, and access to capital. The Company's plan deals with the first three barriers in various ways, but this section of the plan focuses on mechanisms that can help customers afford to carry out energy efficiency upgrades and/or perceive costs differently.

Mechanisms Offered

National Grid and its partners have developed four primary finance mechanisms to help customers afford energy efficiency upgrades, each with unique attributes. Some may only be available or apply to certain customers, building, or ownership types.

9.1. On Bill Repayment (OBR) - Electric

Customer type	Commercial customers who consume more than 1,000 MWh per year
Loan size	$1,000 to ~$100,000 (may be larger for SEMPs)
Maximum Tenor	5 years for commercial accounts, 7-10 years for State facilities
Loan Volume	Variable, between $5MM to $10MM per year
Benefits to customer	No formal credit check/ rapid approval, on bill repayment, zero interest
Limitations	Maximum tenor too short for many comprehensive upgrades, cannot be used to support upgrades customers may desire such as windows and roofs as they have a B/C ratio less than 1.0.
More information	National Grid's revolving loan fund projections for 2021 are illustrated in Attachment 5, Table E-10.
Relevant notes	The Company will continue to work with the EERMC consulting team to understand the best combination of investigative and analytic paths to understand and predict demand for OBR.

9.2. On Bill Repayment (OBR) - Electric Small Business

Customer type	Commercial customers who consume less than 1,000 MWh per year
Loan size	$500 to $50,000
Maximum Tenor	5 years
Loan Volume	Variable, between $1.8MM and $3.0MM per year
Benefits to customer	No formal credit check/ rapid approval, on bill repayment, zero interest
Limitations	Maximum tenor too short for many comprehensive upgrades, cannot be used to support upgrades customers may desire such as windows and roofs as they have a B/C ratio less than 1.0
More information	National Grid's Small Business revolving loan fund projections for 2020 are illustrated in Attachment 5, Table E-10

9.3. On Bill Repayment (OBR) – Gas

Customer type	All commercial gas customers
Max loan size	$1,000 to ~$100,000 (may be larger for SEMPs or special projects)
Maximum Tenor	3 years for commercial accounts, 5 years for State facilities
Loan Volume	Variable, between $1MM and 1.5MM per year
Benefits to customer	No formal credit check/ rapid approval, on bill repayment, zero interest
Limitations	Maximum tenor too short for many comprehensive upgrades, cannot be used to support upgrades customers may desire such as windows and roofs as they have a B/C ratio less than 1.0
More information	National Grid's Gas revolving loan fund projections for 2021 are illustrated in Attachment 6, Table E-10
Notes	

9.4. Efficient Buildings Fund (EBF)

Customer type	State agencies, quasi-state agencies, and municipalities
Max loan size	More than $5MM

Maximum Tenor	Up to 20 years
Loan Volume	Variable, ~$20.5MM loans outstanding to date
Benefits to customer	Below market rate interest, long tenor, loan amounts can be large enough to make comprehensive building wide improvements
Limitations	Appropriate customers must file applications and be ranked against other potential loan applicants
More information	More detail on this mechanism can be found in Attachment 5, Table E-10 and at the end of this attachment in Section 13.
Description	The Efficient Buildings Fund (EBF) is a long-term, low-cost financing option for municipalities and quasi-public agencies to complete energy efficiency and renewable energy projects. Specifically, EBF offers loans no less than 20% below the borrower's market rate of financing. EBF is administered in partnership with RI OER and the Rhode Island Infrastructure Bank (The Bank, Infrastructure Bank, or RIIB). OER is responsible for determining project eligibility, reviewing project applications and producing a Project Priority List (PPL). The Infrastructure Bank only finances projects that are listed on the PPL. OER, the Infrastructure Bank and the National Grid municipal sales representative work together to originate efficiency projects that meet the requirements of least cost procurement. EBF also provides financing for renewable energy projects and uses other sources of capital to finance those transactions. National Grid provides technical and logistical support to customers, principally municipalities, in the following areas: 1. National Grid arranges and incentivizes scoping studies at 100% of cost. The Company also assists customers with paying for more advanced engineering reports that provide more precise savings and cost information necessary to execute an upgrade with confidence. National Grid typically covers 50% of the cost of this report. The Company refers to these reports as Technical Assistance (TA) studies. 2. National Grid also assists municipalities by helping them issue and evaluate Requests for Proposals (RFPs). This includes, but is not limited to, developing an appropriate scope of work, developing technical requirements, supporting coordination between vendors and the municipality, and helping to review submitted

	bids. This is a vital service as municipalities do not have the resources to do this on their own. 3. National Grid funds and manages a University of Rhode Island (URI) fellow who has been a critical element in getting Rhode Island schools benchmarked on the Environmental Protection Agency's (EPA) Portfolio Manager platform. This benchmarking gives schools and municipalities insight into where they might want to prioritize energy efficiency upgrades. 4. National Grid's municipal sales representative works closely with OER and RIIB though virtually every step of the process from the promotion of EBF to post inspection of installed measures. Leads on potential projects may start with National Grid or OER or RIIB. **Program Outcomes** EBF provides upfront loans rather than reimbursable incentives given upon project completion. (Customers who borrow money through EBF still receive incentives from the Company if they are eligible to do so.) In EBF, finance agreements are entered into prior to the construction work commencing, typically after procurement. EBF ensures that the municipality will have capital available to invest in the project and not have to self-finance a project while waiting for a reimbursement. EBF loans are often large and EBF projects can have long construction timelines. Potential timing delays include long municipal approval timelines, construction related delays and other delays due to project intricacies. However, the complex projects in this program unlock deeper energy retrofits than would otherwise be possible. An upfront loan structure greatly enables projects that would otherwise face financing barriers. The drawbacks to an upfront loan structure include 1) the potential for lag between when financing closes and when the project begins and 2) accounting difficulties concerning when funding is allocated and when energy savings are realized. However, EBF attempts to mitigate the chance of construction delay by prioritizing shovel ready projects, and accounting difficulties can be overcome through careful program administration. In general, for this program the benefits of upfront financing are thought to outweigh the drawbacks.

Table 8. Program Outcomes through Year End, as of September 2020

Contributed Capital	$ 21,870,447
System Benefit Charge	$ 16,870,447
SBC Transfer 9/29	$ 5,126,000
Total Loans Issued	$ 20,577,618
Anticipated '20 Loans	$ 27,200,000
Total Loans (12/2020)	$47,777,618
Program Leverage Ratio	2.18x

Table 8 shows a summary of outcomes over the life of the program since inception in 2016.

Two EBF loans are anticipated to close the week of November 2, 2020 as part of a RIIB bond issue. Both loans are for energy efficiency projects and are expected to total $27,200,000.

Program Status

The first EBF loan was issued in 2016. Since that time, additional loans have been issued, funds have been disbursed, and principle has been repaid. In total, nine loans have fully disbursed while the remaining loans are being actively drawn upon. Table 9 describes the status of the program accounts and the amount of loans made for energy efficiency projects.

Table 9. EBF Program Status, as of September 15th, 2020

EE Loans	$ 20,577,618
Funds Disbursed	$ 17,702,442
***Principle Repaid**	$ 2,777,702
**Includes principal from all EE loans regardless of funding source (SBC, bond proceeds, etc.)*	

Borrowers set their disbursement schedule to match when funds are needed for their project. EBF loans typically do not enter repayment until one year after financing is issued. The principle that has been repaid is recycled and made available for issuing new loans. As the program matures and more loans begin principle repayment, the amount of recycled funds is expected to grow significantly. The Bank

	and its partners expect the remaining funds for closed loans to be fully disbursed in 2020 and 2021 and are working with program borrowers to ensure a timely construction schedule.
Pipeline Forecasting and 2021 Transfer Request	EBF does not have a dedicated revenue stream such as the Bank's other revolving loan funds and is supported from electric / gas ratepayer funds (Energy Efficiency) and Regional Greenhouse Gas Initiative funds (Renewables) that allow it to operate. These funds are leveraged in the bond market to result in a pool of funds that is approximately 2x larger than the amount transferred. The funding pool is then used to issue loans to municipalities and quasi-public agencies. As the borrowers repay their loans over the financing term, the funds are returned to the pool and can be recycled to issue new loans. The first loans were issued in 2016 with terms of 15-years and the amount recycled on an annual basis is small. While recycled funds are being invested into new loans coming into the EBF portfolio, until the EBF portfolio grows to a significant size new capital allocation to the program is required. The Bank has developed and implemented a granular method for estimating the program pipeline and transfer amount needed. The program partners assess specific clients who have indicated interest in the program and assign "likelihood" percentages to each project. Likelihood weighing factors were applied to projects following the following framework: • 0.75: These projects have a completed scope of work and town officials have confirmed that they will apply to the program and plan to borrow. • 0.50: Town officials are interested in applying and the Company and the Bank are undergoing project scoping efforts with the town. • 0.25: Initial project conversations are underway, and the Bank expects to receive a decision to finance within one year. • By taking the weighted average of expected projects (specifically, multiplying the expected project funding need by the likelihood of the project moving forward in FY2020, and summing for all projects), an estimated $23,875,000 in project pipeline is expected in 2021.

Table 10. Forecasted 2021 Pipeline: Financing Costs

Loan Number	EE Eligible Financing Estimate	Probability	Weighted Financing Estimate	Construction Completion Estimates
1	$ 4,000,000	75%	$ 3,000,000	2021/2022
2	$ 2,500,000	75%	$ 1,875,000	2021/2022
3	$ 5,000,000	75%	$ 3,750,000	2021
4	$ 4,000,000	75%	$ 3,000,000	2021/2022
5	$ 15,000,000	75%	$ 11,250,000	2021/2022
6	$ 2,000,000	50%	$ 1,000,000	2021/2022
Total*	**$ 32,500,000**		**$ 23,875,000**	

All numbers are EE only

Table 11. Forecasted 2021 Pipeline Loan Descriptions Savings

Loan Number	Project and Measure Description	Annual Savings Estimate - MWh	Annual Savings Estimate - Therms	Lifetime Savings Estimate - MWh	Lifetime Savings Estimate - Therms
1	Lighting upgrades, will move forward once MOU completed between National Grid and RIDOT	1,600	-	24,000	-
2	Comprehensive efficiency, already listed on PPL	867	16,667	13,000	250,000
3	Comprehensive Energy Efficiency, financing in May 2021	1,733	33,333	26,000	500,000
4	Seeking borrowing authority for energy efficiency	1,400	26,667	21,000	400,000

	projects in November				
5	Building Energy Efficiency, has borrowing authority	5,267	100,000	79,000	1,500,000
6	Building Energy Efficiency, on PPL, seeking borrowing authority in November	733	13,333	11,000	200,000

Table 10 and Table 11 above show the expected 2021 pipeline including financing costs, probability of closing the loan and expected annual (over several years) and lifetime savings. The forecasted 2021 pipeline consists entirely of energy efficiency projects.

The EBF program pipeline includes projects from borrowers that have already received authority to borrow or are seeking borrowing authority in November 2020. The Bank's conversations with municipal clients have provided indications that those clients with existing debt capacity will borrow in the near term to take advantage of the historically low interest rates to invest in critical energy efficiency infrastructure projects while not drawing on any rainy day reserve funds.

As indicated in the pipeline, the loan numbers 1 – 6 will begin construction in 2021 and will need funds to start construction. Some of these improvements will be completed in 2021 and others will be completed in the following years.

The EBF has a weighted average pipeline of $23.875 MM in projects. To meet this demand, the Bank is requesting a $5 MM infusion of capital from the energy efficiency plan in 2021 for EBF.

As the program matures over time, the leverage will be achieved with an increasing proportion of recycled dollars and a decreasing proportion of transfer funds. For 2021, the sixth year of the program, a high proportion of transfer funds are needed to support new loans.

RIIB will request funds transferred on an as-needed basis with no more than three funding transfers. A funding request from RIIB will consist of an email to the Company with the following, supporting

	documentation: 1. The relevant, final Project Priority List(s) (PPLs) indicating which projects have been approved for EBF funds and have met the EBF rules and regulations including requirements for cost-effectiveness, 2. Notification from an EBF applicant that they intend to close a loan in calendar year 2021, and; 3. Documentation that RIIB doesn't have sufficient SBC and/or SBC repayment funds to commit to the municipalities in Point 2. The Company will transfer funds to RIIB within sixty (60) days of receiving a confirming funding request from RIIB.
2021 Actions	The Bank and National Grid have also been working with school districts and identified many possible energy efficiency measures to school building retrofits and new construction that would be eligible for financing through the EBF program. The Bank is working with Rhode Island Department of Education and the school districts to determine what portion of school needs falls under Housing Aid and what portion fits better in the EBF program to enable the lowest total cost of financing for the borrower. Determining how portions of a school project should be financed, considering multiple available financing sources and financing organizations, can be complex. The Bank and its partners are building a model that can be applied to other school districts to enable an efficient and standardized funding process for new and retrofit school buildings. This new model will streamline the process for schools and should result in future pipeline growth.
Notes	**Use of Funds** Funds allocated to the EBF, including interest earnings, will be used in accordance with least cost procurement law, the EBF enabling act (Chapter 46-12.2), and regulations filed by the Office of Energy Resources and Rhode Island Infrastructure Bank governing the administration of the program. The Bank administers the EBF as a revolving loan fund, making loans from time to time for eligible projects, and tracks the funds awarded under the Plan independently of other sources of funds which provide additional capital for the EBF program. The funds allocated to the Bank and EBF under prior and future Settlement Agreements have been or will be committed to financing energy efficiency projects. As those loans are repaid into the EBF, such repayments will be re-lent for other eligible energy

	efficiency projects on the OER PPL. To the extent that such repayments have not be re-lent for an eligible energy efficiency project, the repayments will be available to pay debt service in the unlikely event of a default on a RIIB issued EBF bond. Having these loan repayments available to pay debt service in the event of a default on an EBF bond provides significant interest savings for all borrowers of the EBF program. **Bank Statement Regarding Future Allocations** "The Bank believes that a stable allocation of $5 MM provides clarity to the Bank's clients, knowing that there will be funding available on an annual basis for energy efficiency project. We also believe a stable allocation of $5 MM provides clarity for stakeholders involved in the energy efficiency plan process while not negatively impacting ratepayers with changes in the request on an annual basis. The Bank also leverages the funding with private capital from the bond market and we typically invest more than is allocated to the EBF by the plan in any given year. If the energy efficiency plan could accommodate an allocation of more than $5MM, the Bank would take these funds and put them to use in 2021. As the program matures over time, the leverage will be achieved with an increasing proportion of recycled dollars and a decreasing proportion of transfer funds. Over time, based upon the results of how the Bank manages other revolving loan fund programs, the Bank expects to leverage EBF capital 3x to 4x."

9.5. Public Sector Revolving Loan Fund

The Public Sector Revolving Loan fund was a predecessor of the Efficient Buildings Fund. It was funded by Regional Greenhouse Gas Initiative (RGGI) funds controlled by the RI OER. This fund no longer makes loans. As funds are repaid from previous disbursements they are periodically transferred back to RI OER to be used at their discretion. More detail on this fund can be found in Attachment 5, Table E-10.

9.6. Commercial Property Assessed Energy (C-PACE)

Customer type	Owners of non-residential property
Max loan size	Limited only by the financial health of the building

Maximum Tenor	Average measure life of all upgrades, can exceed 15 years
Loan Volume	Variable
Benefits to customer	Can be structured to be cash flow positive, no personal guarantees, financing can be used to finance a wide variety of improvements related to energy, may be considered an operating expense.
Limitations	Minimum transaction value of ~$50,000, preferred $100,000+
Changes for 2021	In 2021, National Grid will continue to work with the Rhode Island Infrastructure Bank (RIIB) and its partners to promote C-PACE. Deliverables: • Case studies co-branded by National Grid and RIIB to demonstrate process for utilizing both incentives and C-PACE • Presentation of mechanism to access new construction resources for in-person and webinar meetings • One-page summary of process with contact information for engaging National Grid and RIIB for new construction resources Marketing Channels: • Property developers with active building pipelines in RI • Municipal Economic Development officers and planning boards/commissions • CommerceRI • Local Chambers of Commerce

9.7. Ascentium Rental Agreement

Customer type	Owners of non-residential property
Max loan size	No stated limit
Maximum Tenor	Variable
Loan Volume	Variable
Benefits to customer	Rapid preliminary approval, rental product is considered an operating cost
Limitations	Specific terms of the agreement may not work for all customer types

10. Other Enabling Strategies for Customer Engagement

10.1. Improving Quality and Efficiency in Project Cycle Times

The Company is committed to providing customers with a more expedited project initiation and incentive application (transactional) experience. The Company continues to look for process improvement relative to processing applications, and the building Technical Assistance (TA) review process.

10.2. Energy Management Framework Platform

In the Fall of 2020, the Company will begin to explore how to collect, catalog, and store specific nameplate information from the customers facility. The Energy Management Framework Platform will be used to facilitate the decision-making processes via advanced insights and data processing. The platform has the potential to help better inform the Company as to what specific energy conservation measures are needed, when such measures should be proposed, and with what level of financing. The tool will be developed with the intent to iterate, modify, and build upon useful data fields, analytic capabilities, and advanced customer insights and trends.

10.3. 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 the various methods described below:

10.3.1. Automated Benchmarking Systems

National Grid has developed a path towards automating data uploads into Energy Star's Portfolio Manager. Automated transfer of usage data to customers helps customers better understand and manage their energy use, supports prior OER commitments to state and municipal facilities improvements, and is an important tool in the future for building labeling. Customers can automatically upload aggregate, whole building energy usage data, both electric and gas, onto Portfolio Manager, allowing building owners and stakeholders to benchmark energy usage and performance and compare usage to similar buildings nationally. In Rhode Island, properties that have three active accounts or less per fuel (electric and/or gas) are required to submit consent forms for each tenant.

The Company will support benchmarking efforts with customer support on automating data uploads as well as provide access to EPA training on Portfolio Manager. Additionally, the Company will send marketing and informational emails to customers to inform them of the

automated benchmarking process. Company support is now available to National Grid customers in RI, MA and NY.

Additionally, the Company will continue to support the White House and DOE Green Button initiative. The Green Button initiative allows customers to securely download their own digital energy usage with a simple click of a literal "Green Button" on electric utilities' websites. This initiative is available to both electric and gas customers.

10.3.2. Building Labeling

The Company will continue to work with OER and other stakeholders to identify strategies for building labeling in the commercial and multifamily real estate sectors in Rhode Island. The Company will continue to work closely with OER to support property owner and tenant access to usage data.

10.4. Enabling Technologies

10.4.1. 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. A heat loss reduction of 135 BTUs per square foot per hour can result from using the jackets and one single turbine can save $9,500 in energy in a year. Touch temperature of the turbine can be reduced from 750^0 F to 145^0 F, improving safety. This product also has a five-year guarantee. This is a custom express gas measure that can save customers tens of thousands of therms annually. The measure will be aggressively implemented by the Company's energy efficiency sales teams in RI to all medium to large C&I customers who use steam and high temperature hot water for processes and space heating. It can also be used on all valves, fittings, steam traps, condensate tanks and uninsulated hot water tanks. The jacket has excellent synergies with general mechanical insulation on piping systems, steam system assessments, and steam trap surveys. National Grid is providing training for these measures with targeted webinars on gas measures and Steam System Assessments. This has been successful at universities, colleges, and hospitals and other large steam users in both Rhode Island and Massachusetts.

10.4.2. Heat Watch

The Company is also facilitating "Heat Watch" for Multifamily, small business, and C&I programs. This service includes running boilers in conjunction with controlling and managing the whole boiler and heating systems for a facility. This service will save 10-15% of energy on steam systems by preventing overheating and improving temperature control of spaces, especially during spring and fall.

10.4.3.CozyTM Radiator Covers

The Cozy ™ Radiator covers are insulated enclosures with a room temperature sensor controlling a fan that introduces heat to the space when needed. It virtually makes each steam radiator its own controllable HVAC zone. One NY University was able to reduce boiler run times by 41%.[8] Non-energy benefits include increased asset value, improved tenant/occupant comfort, reduced emissions, and improved safety. One college in Rhode Island has had good results. This measure is available as a custom project.

10.4.4.Aeroseal

Aeroseal is for both heating and cooling. It provides duct sealing to seal up old leaks by blowing in atomized polymers. This measure has been successful at a Rhode Island college.

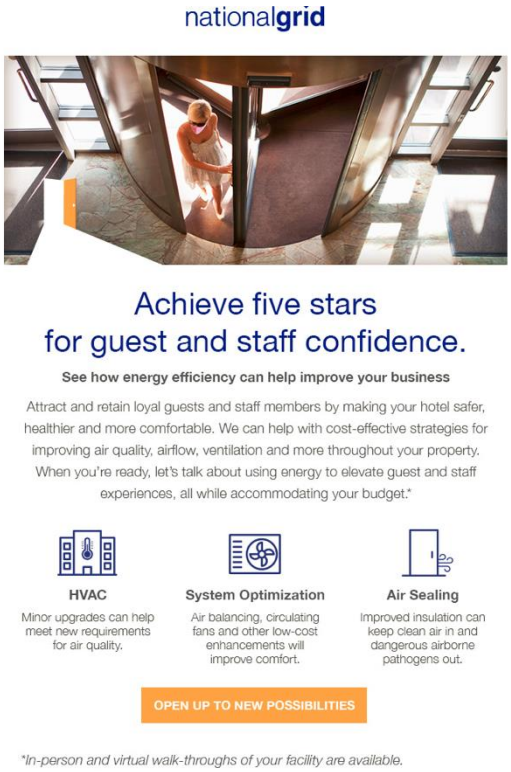
11. Marketing to Commercial and Industrial Customers

In 2020, the Company intended to continue to educate customers about energy efficiency and increase participation in its energy saving offerings for Rhode Island's business customers, which the Company did through mid-March of 2020. Once the COVID-19 Pandemic began, the Company decided to pause marketing communications related to energy efficiency programs in an effort to be sensitive to what our customers were experiencing during this difficult time. The Company kept our website up to date so that any customer who chose to seek out energy efficiency information on their own could still find it. The focus shifted to informing customers about the different resources available to businesses during the pandemic and informing customers about energy efficiency tips that they could perform on their own.

The Company was eventually able to offer virtual energy assessments in some cases and, slowly and cautiously, resumed marketing activities related to energy efficiency programs in July 2020. July featured the launch of the "Open Up to New Possibilities" campaign. This campaign's strategy is to relate to and understand what business customers are going through at this particular moment in time. The messaging does not sell or push any specific product, but instead offers help when customers are ready to discuss how energy efficiency can save them money. The messages also bear in mind the various stages of economic reopening and use language that can be applied to any stage. Visually, the campaign relies on large impactful imagery that adheres to proper social distancing and mask guidelines (see Figure 8).

[8] https://www.radiatorlabs.com/wp-content/uploads/2016/08/CaseStudy-ColumbiaUniversity.pdf

Figure 8. Open Up to New Possibilities Campaign Images



For customer targeting and media planning, the Company continues to utilize its previously attained customer survey research insights data and customer personas (see Figure 9) for the business customer. The Company aims to represent the voice of the customer in all campaign planning. Prior to launching the "Open Up to New Possibilities" campaign, National Grid surveyed our Business Customer Council and utilized the insights from that survey to determine appropriate messaging and imagery.

The Company will continue to utilize commercial customer persona research to inform our key messages and marketing channel selection. However, we will gradually evolve the "Open Up to New Possibilities" campaign based on how business customers in our territory are able to operate and respond as they recover from the pandemic. National Grid will pay close attention to how the pandemic continues to impact customers and remain nimble with our approach.

Figure 9. Commercial Customer Persona Research

Lean & Green	Small & Seamless	Seeking Solutions
• Smallest customers based on usage • Most environmentally conscious, interested in green-related products • Among the most open to purchasing from NG	• Small customers • Interested in tools to manage accounts • Skew to Real Estate • The least open to purchasing from NG	• Medium customers • Interested in bill and usage information, financing options • Skews to Retail/Food • The most open to purchasing from NG

No Frills	Big Business
• Medium customers • Most interested in the basics of customer service and emergency response • Among least open to purchasing from NG	• Largest customers • More interested in advice, tools to track usage and savings • Lowest level of barriers to energy improvements • Skews to Industrial, Public Sector

As National Grid develops 2021 campaign plans, paying close attention to the appropriate messaging and tone as business customers recover and re-open, the Company will dive into the characteristics of each segment and adjust messaging and targeting where appropriate. The goal is to enhance targeting and messaging, not to eliminate any commercial customer targets.

The hope is that over time the "Open Up to New Possibilities" campaign will naturally evolve into the "See the Possibilities" campaign message begun in 2019, which focused on getting business customers to see more of what energy efficiency upgrades and incentives can do for their business. The "See the Possibilities" campaign was developed to serve as an overarching campaign that provides a unified message for large commercial customers, small business customers, and multifamily customers. In 2021, the Company will continue to utilize a fully integrated strategy that leverages digital marketing, paid search and social media marketing, print advertising, email campaigns as well as public relations.

In 2019, the Company began leveraging earned media/PR as a truly integrated part of our marketing campaign (see Figure 10). This includes media relations and influencer engagement and National Grid will continue this strategy moving forward.

Figure 10. Earned Media/PR Strategy

Earned Media/PR Strategy

NEW FOR ALL: Implement a News Bureau Program which allows us to proactively build awareness of National Grid's incentives to all the key stakeholders in each market and across al business segments & verticals through:

- Media Relations - ongoing, proactive pitching of trade and business media
- Influencer Engagement
- Event Management
  - Speaking opportunities for National Grid SMEs (subject matter experts) at strategic events
  - Focus on trade events for outreach to plumbers, electrician associations, etc.
  - Press kit generation to development background information, fact sheets, press releases, images, etc.
  - Considering over 14 events for NYS 2019
- Partnerships with Trade Associations
- Content development and editorial calendar for social media, case studies and more
  - Tie into seasonal and relevant engagements (i.e. small business week social blitz)
  - Promote key topics like new construction, manufacturing, green building in NYS, etc.
    - Allows us to really dig deeper and provide more relevant content to key focal areas
      - Ex: Specifically for UNY property managers, developing content that drives home ways National Grid can help mitigating risk and tenant complaints, provide financial solutions, and improve tenant retention.
  - Business segment specific research studies (i.e. multi-family landlord/tenant research) to build out additional case studies and renter email campaign

While National Grid's paid media primarily targets people directly involved in the decision-making process for capital budgets and facility improvements/projects, C-Suite & Facility Managers, and Small Business owners, the Company does have some advertising and communications dedicated to its secondary audience of key influencers. These are the people/firms that influence energy project go-forward decisions, for example, Distributors, Project Expeditors, Engineers, Architects, etc. who may have an existing relationship with the customer.

In planning for 2021, the Company will continue to focus on the key strategies that have proven successful in 2019 and in the early part of 2020, but will continue to evolve and adjust tone and messaging as appropriate to remain sensitive to our customers' needs. National Grid has continued to work to update our website and campaign landing pages to reflect key messages, strategies, and general core values and has also increased focus on providing industry specific messaging and information wherever possible.

12. Commercial and Industrial Measures and Incentives

Table 12. Electric Programs

Electric Programs					
Program	**Subprogram**	**Net Annual kWh Tracker by Subprogram**	**Incentive / Net Annual kwh**	**Total Incentives**	**Shared Costs**
Large Commercia and Industrial New Construction	D2 CAIR	391,294	$0.15	$57,433	
	C&I Codes	289,000	$0.00	$0	
	D2 Upstream Food Service	110,998	$0.66	$73,315	
	D2 HVAC Prescriptive	1,730,239	$0.28	$487,210	
	Upstream Heat Pump - Ductless	17,766	$1.30	$23,044	
	Upstream Heat Pump - Packaged	27,825	$1.80	$50,000	
	Upstream HVAC Air Conditioners	219,950	$0.40	$88,527	
	Upstream HVAC Controls	11,355	$0.16	$1,776	
	Upstream HVAC ECM Pump	11,355	$0.45	$5,090	
	Upstream HVAC VRF	136,343	$0.49	$67,018	
	D2 Lights	3,033,897	$0.27	$824,387	
	Motors and VFD	166,943	$0.31	$51,614	
	Upstream HVAC Refrigeration	9,405	$1.17	$11,000	
	Comprehensive Design - Custom	554,995	$1.06	$589,000	
	Compressed Air - Custom	1,144,055	$0.62	$714,663	
	HVAC - Custom	1,826,109	$0.97	$1,778,189	
	Lighting - Custom	461,543	$0.32	$149,500	
	Motors & VFD - Custom	231,320	$0.35	$80,750	
	Process - Custom	1,052,380	$0.51	$541,385	
	Refrigeration - Custom	301,481	$0.70	$210,484	
	Other - Custom	108,512	$0.62	$67,785	
	Program Planning & Administration				$218,601
	Marketing				$351,954
	Sales, Technical Assistance & Training				$1,893,580
	Evaluation & Market Research				$163,872

Electric Programs					
Program	**Subprogram**	**Net Annual kWh Tracker by Subprogram**	**Incentive / Net Annual kwh**	**Total Incentives**	**Shared Costs**
Large Commercial and Industrial Retrofit	CHP	1,430,952	$0.38	$547,000	
	Custom: SEM	976,247	$0.04	$39,050	
	EI HVAC	967,430	$0.37	$360,419	
	Custom: Street Lighting	3,987,438	$0.34	$1,365,000	
	EI Light: Prescriptive	23,411,087	$0.42	$9,726,435	
	EI Light: Upstream A-lines and Decoratives	355,447	$0.19	$66,000	
	EI Light: Upstream Exterior	1,316,355	$0.22	$287,500	
	EI Light: Upstream G24 G23, MR Lamps, PAR	355,447	$0.56	$200,000	
	EI Light: Upstream High/Low Bay	3,689,480	$0.26	$945,000	
	EI Light: Upstream Linear Fixture w/Controls	340,607	$1.28	$437,500	
	EI Light: Upstream Linear Luminaires	1,117,190	$0.41	$455,100	
	EI Light: Upstream Retrofit Kits	1,212,258	$0.17	$204,700	
	EI Light: Upstream Stairwell	15,844	$1.16	$18,300	
	EI Light: Upstream TLEDs	1,244,916	$0.12	$147,000	
	Motors and VFD	2,165,797	$0.30	$654,832	
	Compressed Air - Custom	432,045	$0.28	$119,444	
	HVAC - Custom	1,787,287	$0.89	$1,596,383	
	Lighting - Custom	11,900,969	$0.51	$6,014,000	
	Motors & VFD - Custom	152,236	$0.30	$45,325	
	Process - Custom	2,115,552	$0.45	$944,793	
	Refrigeration - Custom	420,205	$0.94	$393,195	
	Other - Custom	101,125	$0.64	$64,517	
	Program Planning & Administration				$885,691
	Marketing				$265,969
	Sales, Technical Assistance & Training				$5,111,193
	Evaluation & Market Research				$842,396
Small Business Direct Install	Lighting	8,305,575	$0.76	$6,343,353	
	Lighting controls	762,234	$1.28	$973,412	
	Non-Lighting	628,384	$0.98	$617,540	
	Program Planning & Administration				$278,307
	Marketing				$281,187
	Sales, Technical Assistance & Training				$338,857
	Evaluation & Market Research				$50,904

Program	**Subprogram**	**Demand Response kW Goal**	**Incentive / Net Annual kW**	**Total Incentives**	**Shared Costs**
Commercial Connected Solutions	Daily DR Resources	4,000	$300.00	1,200,000	
	Peak Shaving DR (MW)	29,600	$50.00	1,480,000	
	Program Planning & Administration				$88,051
	Marketing				$7,564
	Sales, Technical Assistance & Training				$214,490
	Evaluation & Market Research				$0

Table 13. Natural Gas Programs

Gas Programs					
Program	**Measure Groups**	**Net Annual MMBtu Tracker by Subprogram**	**Incentive / Net Annual MMBtu**	**Total Incentives**	**Shared Costs**
Large Commercial and Industrial New Construction	Boilers	3,514	$71	$249,978	
	CODES AND STANDARDS	358	$0	$0	
	Combo Boiler/DHW	893	$135	$120,652	
	Non Boiler Heating	137	$72	$9,941	
	COND WATER HEATER 94%MIN 75-300 and above	288	$143	$41,307	
	COOKING-COMBO OVEN 1	111	$16	$1,720	
	COOKING-CONVECTION OVEN 1	26	$168	$4,341	
	COOKING-CONVEYOR OVEN 1	44	$20	$861	
	COOKING-FRYER-1000	50	$34	$1,720	
	COOKING-COMBO OVEN 1 - Upstream	310	$17	$5,283	
	COOKING-CONVECTION OVEN 1- Upstream	838	$148	$124,068	
	COOKING-CONVEYOR OVEN 1- Upstream	58	$17	$1,000	
	COOKING-FRYER-1000- Upstream	6,180	$38	$232,283	
	COOKING-GRIDDLE 1- Upstream	58	$17	$1,000	
	COOKING-RACK OVEN 1- Upstream	58	$17	$1,000	
	COOKING-STEAMER-1000- Upstream	58	$17	$1,000	
	WATER HEATER - Indirect Upstream	314	$73	$22,797	
	Water Heaters 94 and above	534	$74	$39,594	
	Custom	9,769	$31	$307,184	
	Water Heating Boiler - 94% TE	4,033	$14	$58,414	
	Program Planning & Administration				$129,437
	Marketing				$190,083
	Sales, Technical Assistance & Training				$1,076,780
	Evaluation & Market Research				$98,718
Large Commercial and Industrial Retrofit	Controls	13,065	$20	$264,176	
	Custom: RCx	3,664	$16	$60,000	
	Behavior / Training	2,720	$0	$0	
	DHW	653	$15	$9,500	
	HVAC	19,040	$17	$327,419	
	Prescriptive Steam Traps	56,177	$10	$542,147	
	Custom: General	84,464	$18	$1,485,444	
	Custom: SEM	7,500	$30	$225,111	
	Program Planning & Administration				$245,112
	Marketing				$315,774
	Sales, Technical Assistance & Training				$1,436,967
	Evaluation & Market Research				$182,467

Gas Programs					
Program	**Measure**	**Net Annual MMBtu Tracker by Subprogram**	**Incentive / Net Annual MMBtu**	**Total Incentives**	**Shared Costs**
Small Business Direct Install	Small Business Gas	4,886	$49	$239,274	
	Program Planning & Administration				$6,873
	Marketing				$40,360
	Sales, Technical Assistance & Training				$32,885
	Evaluation & Market Research				$758
C&I Multifamily	Air Sealing_MF	1,020	Average Incentive based on measure mix		
	CUST NON-LGT_MF	7,669			
	Faucet Aerator_MF	56			
	Insulation_MF	10			
	Pipe Wrap (Water Heating)_MF	42			
	Programmable Thermostat_MF	437			
	TSV Showerhead_MF	149			
	WiFi thermostat gas_MF	61			
	Participant_C&I	729	$1,037	$756,000	
	Program Planning & Administration				$28,085
	Marketing				$22,416
	Sales, Technical Assistance & Training				$144,241
	Evaluation & Market Research				$2,476

Attachment 3

2021 Evaluation, Measurement, and Verification Plan

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1. Introduction

Evaluation, Measurement and Verification (EM&V) is an integral and required part of National Grid's energy efficiency program planning process. EM&V provides independent verification of impacts to ensure that savings and benefits claimed by the Company through its energy efficiency programs are accurate and credible. EM&V also provides insight into market characteristics and guidance on energy efficiency program design to improve the delivery of cost-effective programs.

The Company's EM&V Plan continues to focus on evaluating Rhode Island projects, markets, and energy efficiency programs while leveraging as many resources as possible from evaluation studies in other National Grid territories in order to maximize value for ratepayers while minimizing costs. These studies are commissioned by the Company. They are conducted by independent evaluation firms, whose goal is to produce an accurate, complete, and transparent review of Rhode Island's energy efficiency programs and markets. The types of evaluation may include (but not limited to) the following:

- **Impact Evaluations:** Comparisons of claimed savings against actual realized savings using methods such as literature review, billing analyses, engineering methods and onsite data logging as a means of verification.
- **Process Evaluations:** Broad examinations of existing practices, such as program delivery methods, for the purpose of gathering information to draw conclusions about effectiveness of existing processes, highlight best practices, and offer suggestions for future improvements.
- **Market Assessment Studies:** Broad studies aimed at assessing changes in market conditions, such as evolving adoption rates of current energy efficiency technologies.
- **Net-to-Gross Evaluations:** Studies aimed at quantifying the rate of free-ridership and spillover associated with energy efficiency participants and non-participants. The free-ridership rate is the percentage of savings attributable to participants who would have installed the measures in the absence of program intervention while spillover includes the effects of two components:
    1. Participants in the program who install additional energy efficient measures outside of the program as a result of participating in the program, and
    2. Non-participants who install the installation of energy efficient measures as a result of being aware of the program

The study methodologies and savings assumptions from evaluation studies are documented in the Rhode Island Technical Reference Manual (TRM). The TRM is reviewed and updated annually to reflect changes in technology, baselines and evaluation results.

The entire evaluation process is managed by the Company in consultation with the Rhode Island Energy Efficiency & Resource Management Council (EERMC) and the Office of Energy Resources (OER). The EERMC and OER follows each study closely and is involved in planning, work plan development, and review of study results.

The Company's EM&V framework provides confidence among ratepayers and stakeholders that programs are effective and EM&V activities are independent and objective.

2. Evaluation Studies Completed in 2020

The Company, with input from EERMC and OER, expects to complete 19 evaluation studies in 2020 (see below). The research studies include impact evaluations, process evaluations, and market studies in the residential and commercial and industrial (C&I), sectors as well as studies that are considered cross-cutting.

Commercial & Industrial

1. RI-19-CG-CustGas - Impact Evaluation of PY2017 Custom Gas Installations
2. RI-20-CG-CustGasPY18 - Impact Evaluation of PY2018 Custom Gas Installations
3. RI-19-CE-CustElec - Impact Evaluation of PY2018 Custom Electric Installations
4. RI-20-CX-FRSO - C&I Free-Ridership and Spillover Study (draft)
5. RI-20-CX-SEM - Strategic Energy Management Demonstration Evaluation (Year 1, draft)

Residential

1. RI-20-RX-EWSFImpact – Impact Evaluation of 2017-2018 EnergyWise Single Family Program
2. RI-20-RX-EWSFProcess – Process Evaluation of 2019 EnergyWise Single Family Program
3. RI-20-RX-EWMFImpact – Impact Evaluation of 2017-2018 EnergyWise Multifamily Program
4. RI-20-RX-EWMFProcess – Process Evaluation of 2019 EnergyWise Multifamily Program
5. RI-20-RX-IEMFImpact – Impact Evaluation of 2017-2018 Income Eligible Multifamily Program

6. RI-20-RX-IEMFProcess – Process Evaluation of 2019 Income Eligible Multifamily Program
7. RI-20-RX-HERImpact – Impact Evaluation of the 2017-2019 Home Energy Reports Program
8. RI-20-RE-UpstrLight – Residential Lighting Market Assessment – 2019 Shelf Stocking
9. RI-20-RE-UpstrLight – Residential Lighting Market Assessment – 2019 Sales Data Analysis

Cross-Cutting

1. RI-18-XX-Piggybacking - Piggybacking Diagnostic Study
2. RI-19-XX-DataCollect - Primary Data Collection for Potential Study
3. RI-19-XE-HPmarket - Heat Pump Market Assessment (draft)
4. RI-20-XX-`Codes - Rhode Island Compliance Training and Building Permit Review
5. RI-20-XX-Jobs - Rhode Island 2019 Energy Efficiency Workforce Analysis

Section 4 provides detailed descriptions, findings, and recommendations of each of the studies listed above, along with selected research studies completed in other regions and/or other National Grid jurisdictions. The results of the evaluations from other regions and National Grid jurisdictions, most commonly Massachusetts, have been judged by the Company, in consultation with EERMC and OER, to be applicable to Rhode Island's energy efficiency programs. The Company is adopting the results of these studies in 2020 program planning due to similarity, either in the measures offered, or program structure or delivery.

In addition to the studies listed above, the Office of Energy Resources is completing a study to independently verify the energy savings of National Grid's energy efficiency programs and to review the evaluation, measurement, and verification (EM&V) process to ensure quality data, rigorous methods, and appropriate assumptions are being used. This study was legislated in Senate Bill 2500, enacted in June 2018.[1] The Company will carefully review all recommendations emerging from this study and implement those that are feasible when developing future evaluations.

A complete list of historical research studies is provided in Section 5 along with a brief summary of the impact of those results in planning the Company's programs. Prior year studies that have

[1] http://webserver.rilin.state.ri.us/PublicLaws/law18/law18079.htm

been superseded by studies completed since the filing of the 2020 Energy Efficiency Plan have been removed from this list. These studies are available through the request of the EERMC[2], the Rhode Island Public Utilities Commission (PUC)[3], and National Grid.

3. 2021 Planned Evaluation Studies

This section describes planned studies that focus on areas of interest to the Rhode Island energy efficiency programs and build on the deep history of evaluation studies commissioned by the Company over numerous years. In order to optimize the use of evaluation resources, where programs are considered to be similar in program delivery and population served with those offered in Massachusetts, the studies will be done in conjunction with the Company's Massachusetts retail affiliate. The Company will also stay abreast of the voluminous Massachusetts evaluation activities that may be beneficial and applicable in Rhode Island and will use the guidelines provided by the Rhode Island Piggybacking Diagnostic Study to inform this strategy.

Table 2 lists evaluation studies that the Company plans to conduct in 2021 to inform the 2022 Annual Plan and future planning cycles. Barring changes to the 2022 Annual Plan schedule, studies that will be incorporated into the Annual Plan must be completed by July 2021. Study labeling codes take the general form shown in Table 1. For example, RI-17-CG-CustGas refers to the Custom Gas Evaluation Study that started in 2017 in the commercial sector for gas, while RI-18-RX-IESF refers to evaluation study started in 2018 of the income eligible single family program for electric and gas.

Table 1. Study Labeling Code Format

[State]	–	[Year Study Conducted]	–	[Sector]	[Fuel]	–	[Keyword]
RI		19 20 21		R = residential C = commercial X = cross sector	E = electric G = gas X = electric & gas		

[2] https://rieermc.ri.gov/plans-reports/evaluation-studies/
[3] http://www.ripuc.org/

Table 2. Planned Evaluation Studies in 2021

Sector	Study Code	Type	Affected Programs	Study Name	State Lead
C&I	RI-20-CG-CustGasPY19	Impact	Custom	PY2019 Impact Evaluation of Custom Gas Installations (continued from 2020)	RI
C&I	RI-21-CG-CustGasPY20	Impact	Custom	PY2020 Impact Evaluation of Custom Gas Installations	RI
C&I	RI-20-CE-CustElecPY18	Impact	Custom	PY2018 Impact Evaluation of Custom Electric Installations (continued from 2020)	RI
C&I	RI-20-CE-CustElecPY19	Impact	Custom	PY2019 Impact Evaluation of Custom Electric Installations (continued from 2020)	RI
C&I	RI-21-CE-CustElecPY20	Impact	Custom	PY2020 Impact Evaluation of Custom Electric Installations	RI
C&I	RI-21-CX-ISPBaseline	Market	C&I	C&I ISP and Baseline	RI
C&I	RI-20-CE-UpstrLight	Impact	Upstream	Upstream Lighting Impact Analysis (continued from 2020)	MA (with RI sites)
Residential	RI-21-RX-Participation	Market	Multiple	EE Participation and Census Study	RI
Residential	RI-21-RX-NPStudy	Market	Multiple	EE Non-Participant Market Barriers Study	RI
Residential	RI-21-RX-CSNC	Impact/ Market	Codes, RNC	Residential New Construction Baseline and Code Compliance Study	RI

Residential	RE-21-RE-AppRecycling	Impact	Products	Appliance Recycling Impact Factor Update	R
Residential	RI-21-RE-EVDR	Impact	DR	EV Demand Response Program	RI
Residential	TBD	TBD	TBD	Follow-up research on potential study issues	RI
Residential	RI-21-RG-GasHPDemo	Impact	Multiple	Gas Heat Pump Demonstration Evaluation	RI
Residential	RI-21-RE-SolarDRDemo	Impact	Multiple	Solar Inverter Direct Load Control Demonstration Evaluation	RI
Cross-cutting	RI-20-XG-GasPeak	Impact	Res	Gas Peak Demand Study (continued from 2020)	RI
Cross-cutting	RI-21-XX-Jobs	Policy	Multiple	Workforce Associated with Rhode Island Energy Efficiency Programs Analysis Study	RI
Cross-cutting	RI-20-CX-SEM	Process	LCI Retrofit	Strategic Energy Management Demonstration Evaluation (continued from 2020)	RI
Cross-cutting	RI-20-XX-AESCost	Benefits	Multiple	Avoided Cost Study, Gas & Electric (continued from 2020)	RI

The evaluation pathway for pilots, demonstrations, and assessments is based on each effort's scale, budget, scope, and the availability of external data. The Company's EM&V team will provide guidance beginning at the Plan stage for all pilots, demonstrations, and assessments, to ensure design and data collection are suitable to allow for effective evaluation. In cases where an independent evaluation is appropriate, the EM&V team will run the evaluation. For guidelines on the stakeholder review process and which pilots, demonstrations, and assessments will receive an independent evaluation, please see Attachment 8. The evaluation will follow the same established evaluation framework used in evaluations of established programs. This includes management of the independent evaluation vendor by the Company's EM&V team in consultation with the EERMC and OER. See Attachment 8 for further details on pilots, demonstrations, and assessments.

The EM&V team will follow the Company's standard procurement policy that cuts across programs and jurisdictions in order to achieve the lowest cost procurement of required external services while enabling the Company to minimize administrative costs, deliver on program commitments and meet time-sensitive regulatory deadlines. The Company's standard procurement policy is supported and enforced by stand-alone internal procurement function. Contract characteristics below certain thresholds are eligible for sole-sourcing while contract characteristics above thresholds require competitive procurement unless it can be demonstrated to the procurement organization that securing multiple bids is not possible or practical.

The proposed budget for evaluation study expenditures in 2021 is approximately $2.7 million ($1.9 million for electric and $0.8 million for gas), excluding internal staffing costs. The proposed budget for EM&V comprises approximately 1.8% of the total portfolio budget in 2021.

Final reports along with graphical executive summaries will be made publicly available upon completion of the evaluation studies. All complete graphical executive summaries will be provided as a handout at EERMC meetings and posted on the EERMC website.[4]

3.1 Commercial and Industrial Planned Evaluation Studies in 2021

a. RI-20-CG-CustGasPY19 – Impact Evaluation of PY2019 Custom Gas Installations

The objective of this impact evaluation is to provide verification of natural gas energy savings estimates for a sample of custom gas projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom gas energy efficiency offerings based on installations from 2019. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated yearly. This study is scheduled to begin in late 2020 and continue into 2021.

[4] https://rieermc.ri.gov/plans-reports/evaluation-studies/

b. RI-21-CG-CustGasPY20 – Impact Evaluation of PY2020 Custom Gas Installations

The objective of this impact evaluation is to provide verification of natural gas energy savings estimates for a sample of custom gas projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom gas energy efficiency offerings based on installations from 2020. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated yearly. This study is scheduled to begin in late 2021 and continue into 2022.

c. RI-19-CE-CustElecPY18 – Impact Evaluation of PY2018 Custom Electric Installations (continued from 2020)

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of both lighting and non-lighting custom electric projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the final realization rates for custom electric energy efficiency offerings based on installations from 2018. This will be the second year of 'rolling' evaluations in coordination with evaluation efforts in Massachusetts, where the first year was a 'full' study (as has historically been done every 3 years), while subsequent years evaluate roughly 1/3 of the number of sites, which will keep the realization rates updated yearly. This study was scheduled to be completed in 2020, but site work was delayed due to COVID-19-related restrictions, extending the timeline into 2021.

d. RI-20-CE-CustElecPY19 – Impact Evaluation of PY2019 Custom Electric Installations (continued from 2020)

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of both lighting and non-lighting custom electric projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom electric energy efficiency offerings based on installations from 2019. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated yearly. This study was scheduled to begin in summer 2020, but site work was delayed due to COVID-19-related restrictions, extending the timeline into 2021.

e. RI-21-CE-CustElecPY20 – Impact Evaluation of PY2020 Custom Electric Installations

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of both lighting and non-lighting custom electric projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom electric energy efficiency offerings based on installations from 2020. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated yearly. This study is scheduled to begin in summer 2021.

f. RI-21-CX-ISPBaseline – Commercial and Industrial ISP and Baseline

This study will encompass multiple quick-hit analyses to resolve issues related to industry standard practice (ISP) and measure baselines. Traditionally, much of this work is adopted from Massachusetts, and adjustments must be made to account for Rhode Island building codes and markets. Examples include lighting ISP and cannabis growing facility ISP.

g. RI-20-CE-UpstrLight – Upstream Lighting Impact Analysis (continued from 2020)

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of upstream lighting projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the impact savings factors that will apply to upstream lighting offerings. This study will leverage a parallel Massachusetts study, and the final sample will include projects at National Grid customer sites in both Rhode Island and Massachusetts. This study began in 2020 and is rolling into 2021.

3.2 Residential Planned Evaluation Studies in 2021

a. RI-21-RX-Participation – Energy Efficiency Participation and Census Study

The first objective of this study is to assess customer participation in Rhode Island residential energy efficiency programs from 2016 to 2020. The study will describe historical participation, characterize customers that participate in energy efficiency programs and identify customer segments that are potentially underrepresented to inform the RI-21-RX-NPStudy Non-Participant Study. The participation study will rely on secondary data such as the Company's

customer/billing data, program tracking data and third party data and may include assessment by geography, income, home ownership, and others.

A second component of this research will involve a census study and the development of a database which will identify properties, including low-rise and high-rise multifamily buildings, in Rhode Island. The database will be leveraged by internal teams within the Company to identify opportunities for Rhode Island's programs by understanding the population of customers/properties in the state.

b. RI-21-RX-NPStudy – Non Participant Market Barrier Study

The study will provide in-depth research on non-participants to characterize customers that have not participated in the programs, assess barriers to participation and identify engagement opportunities. The study will use multi-mode surveys (web, phone, mail) and in-depth interviews designed to understand non-participants' attitudes, needs and perceptions. This study will build on the Residential Non-Participant Market Characterization and Barriers Study[5] recently conducted in Massachusetts.

c. RI-21-RX-CSNC - Residential New Construction Baseline and Code Compliance Study

The objective of this research is to conduct a baseline study of Rhode Island homes built after the 2018 IECC code cycle and to develop a new User Defined Reference Home (UDRH). The study will assess gross savings for REM/Rate-modeled program homes against the new UDRH and will evaluate compliance rates used to estimate attribution for Codes programs.

d. RE-21-RE-AppRecycling – Appliance Recycling Impact Factor Update

The objective of this research is to update savings assumptions for the Appliance Recycling program by drawing on the characteristics of recycled units as reported in the 2019/2020 Rhode Island program tracking data. The study will identify the current characteristics of refrigerators and freezers being recycled through the program and calculate per-unit gross energy savings (measured as unit energy consumption or UEC), adjusted gross savings, and net savings. The study may also update savings assumptions for dehumidifier recycling.

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[5] http://ma-eeac.org/wordpress/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf

e. RI-21-RE-EVDR– EV Demand Response Program Evaluation

The objective of this study is to evaluate a newly introduced electric vehicle charging program. If approved through this Plan, the summer of 2021 would be the first year of introduction. The goal of the study would be to review all portions of the program in order to find improvements as early as possible. The impact portion would focus on verifying the demand savings occurring due to specific events called by the program. The process portion will survey program participants, along with the current vendor, National Grid implementer, and the specific participating car manufacturers to gather feedback on ways to improve program delivery.

f. RI-21-RX-Others– Follow-up Research on Potential Study Issues

This is a placeholder for follow-up research on additional study issues that may arise in the residential sector if needed by the programs.

g. RI-21-RG-GasHPDemo – Gas Heat Pump Demonstration Evaluation

This study will assess the savings potential for a possible new measure offering, gas heat pumps. The savings will be used to determine if the measure is cost effective. Furthermore, the study will review and determine if this technology is market ready and should be considered as a measure to be included as a full program offering. Some key questions will be how efficient these units work at different temperatures, do they perform close to their rated efficient and can they be the sole heating source of a home.

h. RI-21-RE-SolarDRDemo – Solar Inverter Direct Load Control Demonstration Evaluation

This study will assess the solar inverter direct load control demonstration offering. The goals of this study are to determine the effectiveness of adjusting the power factor in order to minimize the losses associated with converting the solar power to power that can be used for electricity, evaluate energy savings, and determine if this technology is ready to be offered as a full demand response program offering.

3.3 Cross-Sector/Other Planned Evaluation Studies in 2020

a. RI-20-XG-GasPeak – Gas Passive Peak Demand Savings (continued from 2020)

The objective of this evaluation study is to determine the percentage of gas energy savings that occur during peak days and, assuming availability of necessary data, peak hours. The research

area will be broken up into two studies – one for Residential and another for C&I. The C&I and Residential studies will bucket savings for the specific sector into end use categories of heating, water heating, cooking and other. The results of this study will be used to determine the passive peak gas savings that occur due to energy efficiency activities by applying the end use percentage of gas passive peak energy savings to actual end use gas savings that occur in future years. The C&I study is expected to be completed at the end of 2020 while the residential study is expected to be completed in the fall/winter of 2021.

b. RI-21-XX-Jobs – Workforce Associated with Rhode Island Energy Efficiency Programs Analysis Study

The study will identify the workforce associated with National Grid's energy efficiency programs and services delivered in Rhode Island to electricity and natural gas customers. Similar to the workforce studies conducted from 2013 to 2019, the study will survey the Company, vendors, distributors, partners, and market players to quantify the number of jobs and amount of business activities associated with energy efficiency programs in 2020. This study addresses the requirements of General Law 39-2-1.2, enacted by the Rhode Island General Assembly in 2012, and is conducted annually.

c. RI-20-CX-SEM – Strategic Energy Management Demonstration Evaluation (continued from 2020)

The objective of this evaluation is to review the methodologies and processes used to obtain and calculate the savings claimed. The results of this study will assist in monitoring and making continuous improvements to the demonstration.

d. RI-20-XX-AESCost - Avoided Cost Study, Gas & Electric (continued from 2020)

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 is being conducted with regional program administrators.

4. Evaluation Study Findings

RI-20-RE-UpstrLight – Residential Lighting Market Assessment - 2019 Rhode Island Shelf Stocking Survey

Type of Study: Market Assessment Study

Evaluation Conducted by: NMR

Date Evaluation Conducted: August 7th, 2020

Evaluation Objective and High-Level Findings:
The objectives of this study were to assess the following indicators at Rhode Island retailers which participated in National Grid's residential lighting program in 2016–2019:

- Total shelf share dedicated to lighting over time by channel
- The amount of shelf share dedicated to screw-based LED, CFL, halogen, and incandescent lamps by channel
- The pricing (on a per bulb basis), number of bulb packages, and shelf locations of screw-based LED, CFL, halogen, and incandescent lamps by channel
- Differences in pricing and availability for screw-based LED ENERGY STAR® vs. Non-ENERGY STAR products by channel
- The amount of shelf share dedicated to linear lamps (LED vs. fluorescent) by channel

The key findings are summarized below:

- LED shelf share has increased steadily since 2016, whereas CFL and Halogen shelf shares have decreased slowly. Although much lower than in 2017, incandescent shelf-share is second only to LEDs.
- In the past year, Hardware and Home Improvement shelf share for LEDs increased 16% (from 44% to 60%) and 9% (from 63% to 72%), respectively.
- The amount of space dedicated to light bulbs in general continues to decrease in most channels. This indicates that retailers are shifting shelf space to non-lighting products, perhaps due to the longevity of LEDs vs. incandescent and halogen bulbs.
- Hardware, Drug, and Grocery stores continue to devote approximately two-fifths of shelf share to inefficient bulbs: 40%, 47%, and 43%, respectively. In contrast, Discount, Home Improvement, and Mass Merchandise stores devote 30% or less of their lighting shelf space to inefficient bulbs.
- In general, most of the incandescent and halogen bulbs represent categories currently subject to the EISA of 2007 (i.e., Phase I). In addition, while most (71%) of these halogen bulbs meet Phase I efficacy requirements, a very small portion (2%) of the incandescent bulbs do.

- No incandescent or halogen bulbs on store shelves would meet the 45 Lm/W backstop (Phase II).
- The average prices of all technologies, except LEDs, have increased since 2016. This makes LEDs an increasingly viable option. Note that LED prices in all years include the application of incentives, so removal of incentives will boost the LED shelf prices, but sales data research indicates that LED prices have trended downward regardless of incentives.
- LED prices decreased by more than half at Hardware (54%) and Discount stores (73%).
- Smart LED prices decreased for the first time in three years.
- After falling steeply for the past three years, prices of globe and reflector LEDs stabilized or increased in 2019. A-line prices also appear to have stabilized, but candelabra prices continue to fall.

Programs to which the Results of the Study Apply:
Residential Electric ENERGY STAR® Lighting – Upstream

Evaluation Recommendations included in the study:
No formal recommendations resulted from this evaluation.

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

Savings Impact:
This study has no direct impact on claimable savings.

MA-19R09-E-Delta Watt Update

Type of Study: Impact Study (Delta Watts)

Evaluation Conducted by: NMR

Date Evaluation Conducted: March 26th, 2020

Evaluation Objective and High-Level Findings:
This evaluation was conducted on behalf of the Massachusetts Program Administrators (PAs) to update some of the inputs used to calculate LED delta watts in the RLPNC 17-6 Lighting Market Adoption Models (MAMs). The equivalent wattage of bulbs with similar lumen output and the sales weights based on program tracking data tie delta watts directly to program sales. The PAs and EEAC Consultants updated these equivalent wattage bins and sales weights in 2018, and this study repeats that process for data covering January through October of 2019. This study also updates delta watts for linear fixtures sold through the program over the same time period.

The key findings are summarized below:
Updating the wattage by bulb type and upstream sales share based on actual 2019 LED sales resulted in increased delta watts for GSL and decreased delta watts for reflectors and specialties. These changes are based on differences in the lumen output of bulbs purchased through the program in 2019 versus 2018 as well as improved prediction of reflector and specialty halogen wattage equivalence. Generally, relative to 2018, through the upstream program, consumers purchased a higher proportion of high equivalent wattage LEDs in the GSL categories, moderate equivalent wattage LEDs in the reflector category, and lower equivalent wattage LEDs in the specialty category.

MAM Upstream Gross Delta Watt Comparison 2017 – 2019

Bulb Type and MAM Year	Delta Watts[1]						
GSL 2017	33	34	34	34	34	34	35
GSL 2018	36	38	38	38	38	38	38
GSL 2019	38	38	40	40	40	40	40
Reflector 2017	46	46	47	47	47	47	47
Reflector 2018	45	45	46	46	46	46	46
Reflector 2019	43	43	43	43	44	44	44

Specialty 2017	37	37	38	39	39	40	40
Specialty 2018	40	41	41	42	42	42	43
Specialty 2019	34	34	35	35	36	36	36

[1] Note: All values rounded to nearest watt. Values are not rounded in the attached MAM Excel files.

Programs to which the Results of the Study Apply:
Residential Electric ENERGY STAR® Lighting – Upstream

Evaluation Recommendations included in the study:
No formal recommendations resulted from this evaluation.

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

Savings Impact:
The impact of this study varied by bulb type. The delta watts increased for general service lamps but decreased for both reflectors and specialty bulbs.

MA-20R21-E Residential Lighting Hours-of-Use Quick Hits Study

Type of Study: Impact Study

Evaluation Conducted by: NMR

Date Evaluation Conducted: March 31st, 2020

Evaluation Objective and High-Level Findings:
This study re-analyzed metered HOU data collected as part of the 2014 Northeast HOU study to take into account the effects of efficient lamp saturation on HOU, as well as exploring and addressing the distribution of HOU. The revised model was applied to recent lighting inventory data (RLPNC 18-10) to produce estimated HOU values. The study also calculated the percentage of sockets whose HOU rounds to zero by room type and by efficient vs inefficient lamps to account for the distribution bump at zero. Using the state-wide collaborative process, the PAs and EEAC consultants then came to a consensus on how the HOU values would be implemented.
The key findings are summarized below:

- HOU distribution was right skewed and bounded between zero and 24 hours of use per day. While the validity of ordinary least squares (OLS) regression does not hinge on the normality of the underlying distribution, significant departures from a normal distribution can yield estimates and inferences that lack the typically assumed characteristics of OLS regression. Therefore, a transformation was performed on the 2014 HOU data to find a transformation which would allow the HOU distribution to more closely approximate normality.
- Updated model found smaller difference between efficient and inefficient HOU. The 2014 Northeast HOU study provided a point estimate for inefficient lamps (2.3) that was 23% lower than efficient lamps (3.0). Using the model created as part of this study and the 2018 saturation values, the difference was smaller with a 10% difference in HOU between inefficient (2.58) and efficient (2.86).
- Saturation and demographic factors significant in model. Room type, education, tenure, the total number of sockets, and efficient lamp saturation variables for each room type were all found to be significant in the model and were used in the final model.
- Changes in saturation by room type decreased HOU. When the revised model was applied to the most recent lighting inventory data, estimated efficient HOU decreased relative to original lighting data included in the 2014 study. This was driven by relative changes in and the inventory of efficient lamps across room types. The number of efficient lamps in rooms with lower HOU is higher in the 2018 saturation data compared to the data used for the 2014 study.
- HOU appears to increase as energy efficient saturation by room type increases. Models prepared as part of this study to explore the relationship between HOU and saturation revealed a positive and significant relationship between saturation and HOU. This relationship persisted across a variety of models and variable combinations. This finding

is counterintuitive and runs counter to a previous study conducted in California, and it highlights the complexity of the relationship between HOU and individual behavior. Possible explanations include customers with higher overall HOU tending to purchase more energy efficient lamps, and snapback behavior with customers increasing the use of lamps as saturation increases and the cost to operate lamps decreases. With no strong or compelling reasoning behind this phenomenon, care must be taken when drawing any conclusions. Additional work needs to be performed to develop a more complete understanding of the relationship.

- Inefficient lamps comprised a greater proportion of rarely used lamps (less than 0.5 daily HOU). Overall, 20% of lamps were used for less than 30 minutes a day, based on weighted metering data (pre-modeled). Efficient lamps accounted for 45% of the low-use lamps, which was lower than their portion of the entire sample of metered lamp (52%). Not surprisingly, closets had the highest proportion of low-use lamps (66%), and kitchens and the home's exterior tied for the lowest proportion of low-use lamps (10%). Inefficient lamps accounted for the majority of low-use lamps in all room types except kitchens and basements.
- Efficient lamps account for a sizeable portion of replaced lamps. Based on lamp replacement behavior observed as part of the 2018-19 Market Assessment Study, 43% of replaced medium screw-base lamps were efficient (33% CFLs and 10% LEDs) and 57% were inefficient (46%incandescent and 11%).
- Consensus process considered both inefficient and efficient HOU, adjusted for saturation rates in the 2018 to 2019 Lighting Market Assessment (RLPNC 18-10). At a meeting led by the DNV GL team, the PAs and EEAC Consultants agreed to the use of the rounded inefficient HOU (2.6) for direct install and turn-in programs and combined efficient and inefficient HOU (2.7 – unadjusted for cross-sector sales and 3.0 after adjusting for cross-sector sales) for upstream programs for the full 2019 to 2021 program cycle.

Programs to which the Results of the Study Apply:
Residential Electric ENERGY STAR® Lighting – Upstream

Evaluation Recommendations included in the study:
Recommendation: The PAs and EEAC Consultants should apply the consensus-derived HOU for the 2019 to 2021 program cycle. Rationale: The re-analysis of the original 2014 metering data considered additional factors and relied on a modelling approach more appropriate to the distribution of HOU. The PAs and EEAC Consultants carefully considered the results and reached consensus on recommended values. For the upstream program offering, general service, reflectors and specialty bulbs were calculated to be operated at 3.0 hours per day.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
Yes the results for this study were formally adopted and used to calculate the savings.

Savings Impact:
The overall impact of this study reduced the hours of operation in comparison to 2020. As a result, annual gross savings were reduced.

Rhode Island Compliance Training and Building Permit Review

Type of Study: Process

Evaluation Conducted by: NMR Group, Inc

Date Evaluation Conducted: March 2020 – August 2020

Evaluation Objective and High-Level Findings:
The objectives of this study were to (1) document trainings held by Rhode Island Code Compliance Enhancement Initiative between 2017-2019 and (2) review online residential and commercial building permits to explore extent of measure-level energy efficiency data available through online databases.

Programs to which the Results of the Study Apply:
Residential Energy Star Homes & C&I New Construction

Evaluation Recommendations included in the study:
This study recommended ways that online permit data can be improved so that it can be leveraged in future studies. These recommendations include:

- Encourage all municipalities to implement the OpenGov online building permit database system to streamline data access and provide consistency across municipalities.
- Encourage all municipalities to enable record searching on their online building permit databases.
- Encourage all building departments to require the filing of building plans, blower door results, duct blaster results, HERS certificates, and REScheck results as attachments to residential new construction building permits.
- Encourage building departments to require the filing of building plans and COMcheck results as attachments to commercial new construction building permits.
- Encourage building departments to require detailed mechanical permits including heating cooling, and water heating equipment model numbers or equipment type, capacity, fuel, and efficiency for residential and commercial new construction.
- Encourage requiring filing of duct leakage to outside results in addition to total duct leakage results for residential new construction permits.
- If possible, create a flag for new construction in the online database and allow searching for records that are new construction rather than only allowing searching by address.

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

- The Company will promote use of the OpenGov permit database and enabled record searching when engaging with municipalities that have not adopted these practices, including during Code Compliance Enhancement Initiative (CCEI) training activities.

- The Company will coordinate with State staff supporting the OpenGov database to explore opportunities to facilitate or require entry of the data fields, files, and tags identified in the Recommendations, such as funding database development work.

Savings Impact:
This study has no direct impact on claimable savings.

RI-20-RX-EWSF Impact - Impact Evaluation of EnergyWise Single Family Program

Type of Study: Impact

Evaluation Conducted by: Cadeo/Illume

Date Evaluation Conducted: September 4, 2020

Evaluation Objective and High-Level Findings:
The key objective of this evaluation was to verify gross and net energy savings for measure groups installed in 2017-2018 through the EnergyWise Single Family Program. The tables below summarize the results of this evaluation:

EWSF – Ex Post Gross Savings by Measure and Fuel

Measure Group	Measure	Electric (kWh/year)	Natural Gas (therms/year)	Oil (MMBtu/year)	Propane (MMBtu/year)
Domestic Hot Water	Aerators	28	1.4	.15	.14
	-Water Savings (gal)	269	269	269	269
	Showerhead	213	11	1.2	1.1
	-Water Savings (gal)	1,565	1,565	1,565	1,565
	Pipe Wrap/Insulation	46	3	0.3	0.3
Lighting	LED Bulbs	18**			
	LED Specialty/EISA Exempt	15**			
	LED Reflectors	19**			
	LED Fixtures	34**			
Controls	Programmable Thermostat (Heating Savings)	214.6	32	3.3	3.2
	-Fan/pump Savings (kWh)	6	19	19	19
	-Cooling Savings# (kWh)	2	8	8	8
	Wi-Fi Thermostat (Heating Savings)	214.6	32	3.3	3.2
	-Fan/pump Savings (kWh)	6	19	19	19
	-Cooling Savings# (kWh)	2	8	8	8
	Wi-Fi Thermostat (Cooling Only)	51			
Appliances & Plug Load	Refrigerator Rebate	914			
	Refrigerator Brush	10.9			
	Smart Strip	105			
	Smart Plugs°	-			
Weatherization	Air Sealing Kit	94	3.7	0.38	0.38
	Weatherization (Heating Savings)	803	96	9.8	9.6
	-Furnace Fan Savings (kWh)	10	32	32	32
	-Cooling Savings^ (kWh)	27	16	16	16
Early Retirement	Room Air Conditioner°	161			
	Dehumidifier°	159			
	Clothes Washer°,*	Varies; see engineering workbook for details			

*Includes various combination of water heating and dryer fuel types
**Net savings, not gross
°Not offered in 2017/2018; estimating savings for prospective use only.
#Only relevant for central air conditioners (CAC); per-unit savings are weighted to reflect prevalence of CACs for EWSF participants (11%)
^Relevant for all cooling types; per-unit savings are weighted to reflect prevalence of CACs, room air conditioners, and no air conditioning

EWSF – Net-to-Gross Ratios (Measure Group)

Measure Group	Relevant Measures	Sample Size	Freeridership	Spillover	NTG
Domestic Hot Water	Showerheads, Aerators, & Pipe wrap	52	0.27	0.01	0.74
Appliances & Plug Load*	Smart Power Strips	163	0.31		0.70
Controls	Programmable & Wi-Fi Thermostats	40	0.47		0.54
Weatherization**	Air Sealing & Insulation Types	151	0.14		0.87

*Too fewer refrigerator rebates in 2017/18 to assess NTG
**No statistically significantly different results by fuel type

EWSF – In Service Rates (Measure Group)

Measure Group	Relevant Measures	Sample Size	Installed	Removed	In-Service Rate
Domestic Hot Water	Faucet Aerators, Showerheads, Pipe Wrap	45	242	5	98%
Appliances & Plug Load	Smart power strip*	246	415	66	84%

*Based on the total number of smart power strips left for participants to install (not the subset of units that participants went on to install). Also, as noted above, a recent study in Massachusetts determined that 8% of strips are improperly installed. As a result, National Grid should apply a 92% realization rate (in addition to this ISR - and NTG rate) when calculating the net savings for smart strips.

Programs to which the Results of the Study Apply:
Residential Electric and Gas EnergyWise – Single Family

Evaluation Recommendations included in the study:
Use gross savings, in-service rates and net-to-gross values developed as part of this study for 2021-2023 program planning.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid has adopted the gross savings, in service rates and net to gross values from this study.

Savings Impact:
The application of study results will decrease the claimable electric and gas savings from the Residential EnergyWise Single Family Program.

RI-20-RX-EWSF Process Evaluation of EnergyWise Single Family Program

Type of Study: Process

Evaluation Conducted by: Cadeo/Illume

Date Evaluation Conducted: September 4, 2020

Evaluation Objective and High-Level Findings:

This study assessed overall effectiveness of program delivery to provide actionable recommendations to prospectively increase cost-effectiveness, participation rates and customer satisfaction of the EnergyWise Single Family program. The key findings of the process evaluation are summarized below:

Participants had a positive program experience. 92% of participants reported they were satisfied with their experience in EWSF. In another indicator of satisfaction, 97% of participants said they would recommend the program to a family or friend. Also, 72% of EWSF participants shared that their experience in the program favorably changed their perception of National Grid (26% said it did not change their existing perception and only 2% said their experience had a negative impact.)

Stakeholders credit RISE for creating a high functioning program environment. Assessor and contractors consistently cited RISE's responsiveness to their feedback and effort to improve EWSF for participants and program stakeholders alike. Contractors appreciate RISE's management of the program and are satisfied with the steady way they get new weatherization jobs through RISE. Several assessors mentioned that they feel like RISE is supportive and listens to their feedback and is committed to making the program a positive experience for assessors as well as participants.

Participants increasingly know what they want. Assessors observed that an increasing number of EWSF participants sign up for the assessment knowing they want to get their home weatherized or specifically to access the HEAT loan financing for a heating system upgrade. Assessors noted that, in the past, most participants were unsure of what their home needed prior to the assessment or what the program could do for them. The results of the participant survey supported this observation; 80% of participants cited access to weatherization incentives as very important in their decision to get an assessment. This finding is consistent with a maturing program and indicate that National Grid's ongoing marketing efforts are building familiarity with the program and its offerings.

Health and safety barriers remain problematic — for participants and contractors. According to program records, assessors identified a health and safety barrier in nearly two-thirds (64%) of

EWSF homes in 2019. Of these participants, only 21% went on to weatherize their home, a lower weatherization rate than participants that did not face a health and safety barrier (43%) or for EWSF participants overall (25%). However, the program data showed that 57% of participants who weatherized their home in 2019 overcame at least one health and safety barrier, which is encouraging. Assessors expressed frustrations that they, per program guidelines, could not provide participants with more direct guidance to help them remediate identified barriers. Specifically, assessors frequently mentioned that they wished they could recommend specific remediation contractors or at least provide participants with a list of program-approved remediation contractors. Assessors felt that putting the onus on customers to identify and engage remediation contractors themselves caused a drop-off in participation.

Opportunities exist to serve delivered fuel customers more comprehensively. Assessors consistently noted the program's current inability to incentivize energy optimization measures, such as ductless mini-splits that enable participants with an inefficient oil and/or propane heating system, to switch to a high efficiency electric or gas option, prevents many participants from taking action. . According to assessors, bringing back the incentives previously offered for ductless mini-splits and/or allowing delivered fuel customers to finance heating system upgrades (to more efficient delivered fuel systems or to a high efficiency electric or gas option) would unlock much of the unrealized savings opportunities they identify in EWSF participating homes. However, the decision to incentivize energy optimization measure resides with the Public Utilities Commission, not National Grid.

The 100% landlord incentive has increased rental property participation. Program managers and assessors alike reported that the increase to a 100% renter/landlord incentive (in 2019) has enabled the program to reach previously hard-to-access rental properties. Program data support their statements: 12% of participants in 2019 lived in a rental property, a 50% increase over 2017 and 2018 (8%). Assessors also shared that the paperwork and coordination necessary to get renters and landlords on the same page can be tricky because the landlords often live elsewhere, or the renters are not overly engaged in the process.

Virtual assessments are promising but stakeholders share a healthy skepticism. Assessors shared that participants seem to enjoy and engage in virtual assessments. Assessors themselves also appreciate the streamlined and shortened assessment process, particularly the time they save for themselves (e.g., traveling to homes) and customers (e.g., scheduling 45-minute assessment during work day rather than taking time off work for a 2 ½ hour appointment). Assessors mentioned that the virtual process is much easier for straightforward home layouts (e.g., ranch style home) whereas it can be problematic for older homes of certain styles (e.g., Victorians). Assessors, program managers, and contractors expressed a healthy skepticism regarding accuracy of virtual assessments relative to in-home assessments; they are all curious to see whether the virtual assessment yields sufficiently accurate weatherization scopes of work and adequately identifies pre-weatherization barriers. Assessors noted that while the verdict

will be out until contractors go back on site in greater numbers, they are optimistic that there is a place for the virtual assessments in the program long-term.

Programs to which the Results of the Study Apply:
Residential Electric and Gas EnergyWise – Single Family

Evaluation Recommendations included in the study:

Recommendation 1: Leverage word-of-mouth program awareness through realtors or home inspectors. Many assessors noted that participants who recently purchased their home frequently heard about the program through their realtor or home inspector. National Grid should cultivate relationships and provide EWSF marketing materials to local realtors and inspectors to increase new home buyer participation and encourage customers to act early in their time in the home to maximize the return on their efficiency improvements

Recommendation 2: Increase facilitation of health and safety barrier remediation. Assessors and participants described the difficulty of remediating health and safety issues and expressed a desire for more support from the program. Specifically, National Grid should work with RISE to (1) Create a list of approved electricians and/or increase RISE's ability to handle some barriers, (2) Providing informational materials explaining issues and step by step process to address issue, or (3) Raise $250 incentive for certifying knob and tube deactivation to encourage more contractors to undertake these critical inspections.

Recommendation 3: Identify the optimal long-term role for virtual assessments. Though there is some uncertainty, stakeholders assert that there is a place for virtual assessments long-term. Virtual assessments may be more successful depending on the type or layout of home and participant engagement. National Grid should identify the optimal role for virtual assessments long-term by experimenting with deploying virtual assessments participant segments including participants with straightforward home types or by participant interest or need (scheduling need, safety need etc.). Offering a mix of in-home and virtual assessments may yield similar savings with lower program delivery costs. Future evaluations could embed more research specifically related to virtual assessments and virtual program components overall. Evaluation research focused on virtual assessments could help inform program design and delivery issues, as well as how virtual processes implemented for assessments could be leveraged for other program components. This type of assessment has implications for both process and impact evaluation components, given issues related to direct versus self-install of energy efficient measures.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid will review and consider the recommendations in program planning.

Savings Impact:
This study has no direct impact on claimable savings.

RI-20-RX-EWMF Impact - Impact Evaluation of EnergyWise and Income Eligible Multifamily Program

Type of Study: Impact
Evaluation Conducted by: Cadeo/Illume
Date Evaluation Conducted: Anticipated in September 2020

Evaluation Objective and High-Level Findings:
The key objective of this evaluation was to verify gross and net energy savings for measure groups installed in 2017-2018 through the EnergyWise Multifamily and Income Eligible Multifamily Program. The tables below summarize the results of this evaluation:

MF – Ex Post Gross Savings by Measure and Fuel

Measure Group	Measure	Electric (kWh/year)	Natural Gas (therms/year)	Oil (MMBtu/year)
Domestic Hot Water	Aerators	38	2.0	0.2
	-Water Savings (gal)	359	359	359
	Showerhead	246	13	1.4
	-Water Savings (gal)	1,786	1,786	1,786
	TSV Showerhead	315	16	1.7
	-Water Savings (gal)	2,254	2,254	2,254
	Pipe Wrap/Insulation (per foot)	8.3	.5	.05
Lighting (Common Area)	LED Fixture (Interior)	206		
	LED Bulbs (Interior)	179		
	LED Reflector (Interior)	140		
	LED Fixture (Exterior)	503		
	LED Bulbs (Exterior)	162		
	LED Reflector (Exterior)	210		
Lighting (In-unit)	LED Bulbs	18		
	LED EISA EXEMPT	15		
	LED Reflectors	19		
	LED Fixtures	34		
Controls	Programmable Thermostat (Heating Savings)	249	15	1.6
	- Fan/pump Savings (kWh)	14	14	14
	-Cooling Savings# (kWh)	15	15	15
	Wi-Fi Thermostat (Heating Savings)		23	
	-Fan/pump Savings (kWh)		22	
	-Cooling Savings# (kWh)		9	
Appliances & Plug Load	Refrigerator Rebate	914		
	Smart Strip	105		
	Weatherization (Heating Savings)	CV	CV	CV
Heating System	Boiler (Residential & Commercial)		CV	

#Per-unit savings weighted to reflect prevalence of CACs for MF participants

EWMF – Net-to-Gross Ratios (Measure Group)

Measure Group	Relevant Measures	Sample Size (EWMF)	Free-ridership	Sample Size* (Adjusted)	Freeridership* (Adjusted)	Spillover	NTG
Appliances & Plug Load	Smart Power Strips	2	0.32	163	0.31		0.70
Controls	Programmable & Wi-Fi Thermostats	19	0.48	-	-		0.53
Domestic Hot Water	Showerheads, Aerators, & Pipe wrap	25	0.08	-	-	0.01	0.93
Lighting - Common Area	LED bulbs or fixtures in common areas	1	0.40	72	0.23		0.78
Weatherization	Air Sealing & Insulation Types	28	0.33	-	-		0.68

*Because of the low n for these EWMF measure groups, the evaluation team used values from the EWSF evaluation for the Appliance and Plug Load measure group and values from the MA Res 44 evaluation for the Common Area Lighting measure group.

MF – In-Service Rates (Measure Group)

Measure Group	Relevant Measures	Sample Size	Installed	Removed	In-Service Rate
Domestic Hot Water	Faucet Aerators, Showerheads, Pipe Wrap	27	69	7	90%
Appliances & Plug Load*	Smart power strip	246	415	66	84%
Controls	Programmable or Smart (Wi-Fi) thermostat	20	42	2	95%

*Based on the EWSF in-service rate due to insufficient EWMF responses for that measure group.

Programs to which the Results of the Study Apply:
Residential EnergyWise Electric and Gas - Multifamily
Residential Income Eligible Electric and Gas - Multifamily
C&I Retrofit Gas - Multifamily

Evaluation Recommendations included in the study:
Adopt the gross savings, in-service rates and net-to-gross (not applicable to Income Eligible Multifamily) values developed as part of this study for 2021-2023 program planning.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid has adopted the gross savings, in service rates and net to gross values from this study.

Savings Impact:
The adoption of study results led to an increase in electric savings for the Income Eligible Multifamily program and a decrease in electric savings for the EnergyWise Multifamily program. For gas, the results led to a decrease in savings for both multifamily programs.

RI-20-RX-EWMFProcess – Process Evaluation of EnergyWise and Income Eligible Multifamily Program

Type of Study: Process

Evaluation Conducted by: Cadeo/Illume

Date Evaluation Conducted: Anticipated in September 2020

Evaluation Objective and High-Level Findings:

This study assessed overall effectiveness of program delivery to provide actionable recommendations to prospectively increase cost-effectiveness, participation rates and customer satisfaction of the EnergyWise Multifamily and Income Eligible Multifamily programs. The key findings of the process evaluation are summarized below:

Overall program satisfaction among participants is high. Among residents, 86% reported that they were very, somewhat, or moderately satisfied with the program overall. Building owners and managers are also satisfied with the program overall.

Contractors, assessors, and inspectors believe the program works well, and report satisfaction with these relationships. Stakeholders did not have many suggestions for program improvement, suggesting that program processes are generally working well. Program stakeholders described the trusting relationships that they have with one another, and how this contributes to their overall satisfaction.

RISE assessors and inspectors reported that the MF paperwork is burdensome. This is, in part, because MF assessors and inspectors must still complete all program paperwork in hard copy, via paper and pen. By contrast, EWSF digitized its paperwork a year ago with the introduction of iPads, which EWSF assessors noted had substantially increased their efficiency. MF assessors noted the improvement for EWSF and speculated that a similar transition to digital paperwork would yield similar benefits for the MF program.

Some program participants reported needing more help to overcome health and safety barriers. These participants wanted additional support, including more specific guidance on how and who could help them remediate the identified health and safety barriers so they could move ahead with their efficiency upgrades. As the program continues to mature, it may become more important to help these types of participants, in order to unlock future energy savings opportunities.

Some participants expressed frustration that they did not receive certain measures that they expected, particularly related to smart thermostats and lighting. While participants receive a

report that includes the measures they qualify for, the report does not explicitly detail measures customers did not qualify for. This information tends to be communicated verbally by MF staff, which led to confusion, uncertainty, or disappointment among participants.

A subset of residents expressed concerns about their experience with their installation contractor. Almost one in five surveyed residents noted messes left behind, a lack of professionalism, and the inability of their installers to answer questions. While the current inspection process tracks and reports installation quality-related issues, further, the program also conducts customer satisfaction surveys and program staff report that RISE follows up with contractors who get poor customer reviews.

The program quickly transitioned to virtual assessments in response to the COVID-19 pandemic. Program stakeholders generally think there is a role for virtual assessments in future versions of the MF program. In fact, MF inspectors suggested that there might even be an expanded role for virtual work in certain types of inspections. However, nearly all program stakeholders also expressed some level of skepticism about virtual assessments, primarily about the program's ability to accurately assess complex buildings without a physical inspection.

National Grid program staff are interested in exploring alternative program models. The Massachusetts Program Administrators have transitioned to a residential coordinated delivery structure that integrates single-family and multifamily solutions. As described in this report, some customers fall into a "gray" area in terms of service – specifically, customers within what are technically classified as multifamily condominium properties, yet the individual condominium homes are single family-style homes. The goal of a potential new structure in Rhode Island would be to identify and develop better solutions for these customers.

Programs to which the Results of the Study Apply:
Residential EnergyWise Electric and Gas - Multifamily
Residential Income Eligible Electric and Gas - Multifamily
C&I Retrofit Gas - Multifamily

Evaluation Recommendations included in the study:
To be updated in the next draft when study is finalized

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
To be updated in the next draft when study is finalized

Savings Impact:
This study has no direct impact on claimable savings.

RI-20-RX-HERImpact – Impact Evaluation of the 2017-2019 Home Energy Reports Program

Type of Study: Impact

Evaluation Conducted by: Cadeo/Illume

Date Evaluation Conducted: August 28, 2020

Evaluation Objective and High-Level Findings:
The objective of this study was to evaluate how much electricity and natural gas the Home Energy Reports (HER) program saved in Rhode Island from 2017 to 2019. The evaluation team used monthly customer billing data to estimate electricity and natural gas savings for the program overall and for specific customer sub-groups.

From 2017 – 2019, the program achieved adjusted net energy savings of 86,092 MWh and 2,804,768 therms over the three-year period with overall realization rates of 98% for electric savings and 84% for gas savings. Among waves with electric service, the overall realization rate of evaluated net ex post savings to implementer-estimated savings is 108% for Existing Customers and 67% for New Movers. Among waves with gas service, overall realization rates are 92% for Existing Customers and 50% for New Movers (see table below).

Summary Program Results

	Electric Savings (MWH)		Gas Savings (Therms)	
2017 – 2019 Net Savings	**Existing Customers**	**New Movers**	**Existing Customers**	**New Movers**
Evaluated Ex Post [a]	71,895	14,197	2,493,023	311,745
Implementer-Estimated Ex Post [b]	66,719	21,046	2,700,289	629,629
Realization Rate [c]	**108%**	**67%**	**92%**	**50%**

[a] Evaluated savings that have been adjusted for savings attributable to participation in other energy efficiency programs. These are energy savings attributable to HERs that would not have occurred in the absence of the program.
[b] The program implementer provides monthly savings estimates by wave in a monthly report. National Grid adds up the monthly savings estimates for an annual total.
[c] The ratio of adjusted net ex post savings to implementer-estimated ex post savings.

Savings estimates for New Mover and for some Existing Customer waves and years were not statistically significant. Among Existing Customer waves, savings from older and larger waves were more likely to be statistically significant, while newer waves or those with smaller treatment and control groups were not. As expected, due to the small wave sizes and limited baseline data for New Mover waves, the evaluation team and program implementers' savings estimates for New Mover waves were not statistically significant. However, with an RCT design, the point estimate is still the best unbiased estimate of savings even if it is not statistically significant.

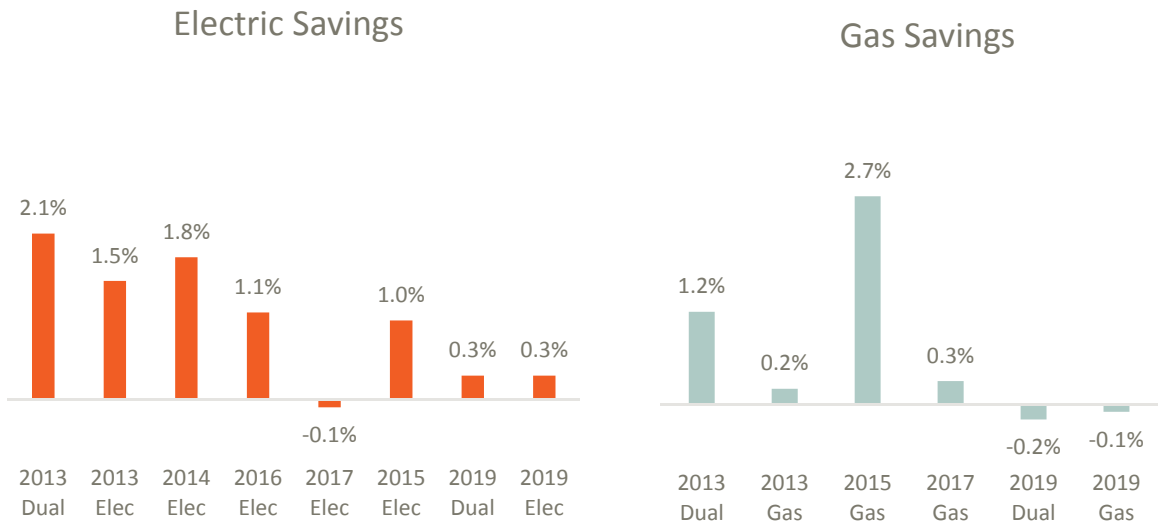
Realization rates fluctuate across waves, years, and evaluation cycles; however, implementer-reported 2017 – 2019 savings generally fall within the evaluation team's unadjusted savings confidence intervals.6 A combination of factors can cause differences in savings estimates. For example, the program implementer calculated results on a monthly basis while the evaluation team estimated annual models. Tracking program progress monthly has many benefits with the trade-off that final annual evaluated net ex post savings may differ from the summed up monthly results. Additionally, existing wave group sizes shrink through natural attrition, resulting in smaller treatment and control group sizes each program year. As the number of customers in a wave is reduced, so is the statistical power of the model, resulting in larger confidence intervals and potentially fluctuating realization rates. While fluctuating realization rates can make planning more challenging, across all waves and years, implementer-reported savings are generally within the 90% confidence interval of the evaluation unadjusted net ex post savings.

Among Existing Customer waves with electric service, those who started receiving reports earlier generally have higher and statistically significant electric savings per household compared to later waves. In 2019, the three waves that began in 2013 and 2014, along with the 2018 wave, have the highest savings (2.1%, 1.5%, and 1.8%, respectively). The 2016 and 2018 waves have moderate savings (1.1% and 1.0%, respectively) while the 2017 and 2019 waves have very low and not statistically significant savings (-0.1%, 0.3%, and 0.3%, respectively). It is too early to draw conclusions about the 2019 waves since savings for report-based feedback and education programs generally ramp up over time.

Among Existing Customer waves with natural gas service, household natural gas savings fluctuate from year to year and across waves without a clear pattern **Error! Reference source not found.**. For example, in program year 2019, the 2015 Gas and 2013 Dual Fuel waves had the highest savings (2.7% and 1.2%, respectively) while 2014, 2017, and 2019 waves had savings less than 0.5%.

[6] The program implementer does not adjust for nor remove uplift or joint savings achieved through other energy efficiency programs, so their savings estimates are most comparable to unadjusted evaluation results (before evaluation removes uplift savings).

2019 Electric and Gas Household Percent Savings by Wave



The 201703 wave produced low (<0.1%) electricity savings in all three years and low gas savings (<0.5%) in two out of three years of the program cycle; no savings estimates were statistically significant. Other National Grid waves have produced at least 1% of electricity savings by their third year of treatment and at least 0.5% of gas. Notably, this wave has the second lowest baseline electricity consumption and second lowest baseline gas consumption, indicating less opportunity for HER recipients to reduce their consumption. Additionally, the wave has a higher percentage of lower-saving personas compared to waves overall, a higher portion of savings deriving from participation in other energy efficiency programs, and a relatively lower percentage of treatment customers who receive email HERs (eHERs) (53%) compared to the population (58%).

Only 58% of customers received emailed HERS (eHERs). The percentage was even lower when focusing on gas customers: less than 50% of customers in three gas waves received eHERs. Customers who do not have an email address on file also cannot receive high bill alerts (HBAs) and other program messaging.

Treatment group customers participated in other energy efficiency programs more often than control customers. Print HERs and eHERs cross-promote other National Grid energy efficiency programs to highlight ways customers can save more energy and money. Overall, the National Grid HER program produced an incremental increase (relative to control group customers) in program participation of 3.5% (13,373 customers) for ENERGY STAR® Products and 5.2% (19,679 customers) for the Energy Wise Single Family program among electric-metered customers cumulatively over the three program years. Among gas-metered customers, the program produced 4.2% (8,482 customers) incremental participation in the Energy Wise Single Family program, and 1.8% (3,750 customers) incremental participation in the Residential Gas Heating &

Water Heating program cumulatively over the three program years. These increases are consistent with report messaging that included information on these programs multiple times over the three-year cycle along with no-cost, behavior-based, energy-saving tips. Participation in other energy efficiency programs accounted for 2.2% and 8.6% of unadjusted modeled net energy savings for electric and gas savings, respectively. To avoid double counted savings, we removed these savings from the modeled savings estimates for the HER program.

Programs to which the Results of the Study Apply:
Residential Behavioral Electric and Gas Program

Evaluation Recommendations included in the study:
Recommendation 1: For planning purposes, we recommend that National Grid use the weighted average 2017 – 2019 electric realization rates of 108% for Existing Customers and 67% for New Movers. For gas we recommend that National Grid use 92% for Existing Customers and 50% for New Movers. We recommend using separate realization rates for these two groups given their structural and performance differences.

Recommendation 2: For Existing Customer waves, going forward, establish treatment and control group sizes that are large enough to allow for multi-year (five or more years) customer attrition, and also consider updated forecasts or estimates of per-household HER savings.7 An assessment of prior-year confidence intervals and statistical significance or a power analysis could inform group size guidelines.

Recommendation 3: Continue to monitor realization rates and treatment and control group sizes, although there is currently no need to make changes to existing wave configurations. With respect to the implementer's evaluation, measurement, and verification (EM&V) methods, continue to monitor any changes in their approach and consider requesting an annual savings "true-up" (from an annual model) to assess whether the monthly approach may be a potential driver of differences in realization rates.

Recommendation 4: Monitor the 2017 wave for improvement over time. If savings do not improve, National Grid could consider additional efforts to understand and reach this wave such as: (1) surveys or in-depth interviews to better understand the barriers to saving energy and what interventions may be more effective, (2) marketing campaigns to increase the number of email addresses on file which will increase access to eHERs and other program enhancements, and (3) targeted messaging by persona, especially those that tend to have lower savings overall. If the program offers additional program enhancements or new ways to engage, consider

[7] The size of treatment and control groups, the variability of customer consumption, and the magnitude of savings influences statistical significance. For example, waves with lower expected savings (due to, for example, lower baseline usage) or more variable customers may require larger groups for evaluation.

setting up an experimental design within the 201703 wave to test for the incremental effects of the effort.

Recommendation 5: To increase engagement with the program, National Grid could consider efforts to collect more email addresses. These efforts could include: (1) messaging on printed reports that shares the benefits of signing up for eHERs, (2) messaging on other National Grid communications, and (3) rewards or incentives for signing up for eHERs or using the online portal.

Recommendation 6: Continue balancing messaging on low- and no-cost energy-saving tips with cross-promotion to encourage participation in other energy efficiency programs as HERs successfully channel customers to other programs. Per regulatory frameworks, the incremental savings are removed from the HER program's savings. Targeted, thoughtful use of energy efficiency program messaging can help customers save energy and boost participation in other programs while limiting the impact on HER program savings.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid has adopted the realization rates (Recommendation 1) based on this study and Recommendations 2-6 are under consideration.

Savings Impact:
The application of study results will increase the claimable electric savings and decrease claimable gas savings from the Home Energy Reports Program.

RI-19-CG-CustGas - Impact Evaluation of PY2017 Custom Gas Installations

Type of Study: Impact

Evaluation Conducted by: DNV GL

Date Evaluation Complete: May 26, 2020

Evaluation Objective and High-Level Findings:
The objective of this impact evaluation was to provide verification or re-estimation of energy (therms) savings for a sample of custom gas projects through site-specific inspections, end-use monitoring, and analysis. The site-specific results were aggregated to determine realization rates for National Grid's custom gas installations in RI.

Yearly Results and Pooled Results

Parameter	PY2016	PY2017	PYs 2016+2017
Tracking Savings	1,114,770	1,948,383	3,063,153
Sample Size	8	6	14
RR	71%	92%	85%
Relative precision @ 80% CI	±11.0%	±2.3%	±4.3%
Error Ratio	0.27	0.3	

CI = confidence interval

The program continues to generate significant natural gas savings. In RI, PY2017 participation consisted of 98 distinct accounts and adjusted gross saving of 1.95 million therms annually, with nearly 92% of the savings realized, based on the evaluation of the sample of RI PY2017 sites.

The original sample was designed to estimate the overall realization rate of the program by combining results from three program year evaluation studies (PYs 2014, 2016, and 2017) to achieve reliable relative precisions, but in this case reliable results were produced from combining results from just two programs years, 2016 and 2017.

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

Evaluation Recommendations included in the study:

Recommendations

R1: Realization Rate: DNV GL recommends National Grid to use the PY2016 and PY2017 combined RR of 85% for planning and program reporting, starting with PY2021 and continuing to subsequent years until a new impact evaluation study results are available.

R2: Research Methods for Steam Traps Estimation and Heat Load Reduction to Gas Savings Conversion: Steam traps constitute a large share of custom program savings and had a poorer realization rate in this evaluation when compared with other measures. Three out of 6 sampled sites in this study are steam trap projects and the average weighted RR for steam traps projects is 78% compared to 105% for other measures (non-steam traps). This raises the issue of whether steam trap measures should be treated as a separate segment within the custom program or even evaluated separately entirely. The latest steam trap tool that is being used for all projects was vetted and calibrated using participant billing data in 2016. The evaluation observed major discrepancies in operating condition assumptions like operating hours, steam pressures, etc. used in the tracking analysis, and potentially, the steam trap calculator could benefit from another round of calibration incorporating additional sites from recent evaluations.

Measures such as insulation and steam traps reduce the heating load served by a boiler. Converting the heat load reduction from these measures to natural gas savings requires a boiler efficiency. There have been discussions with National Grid and not full agreement on how the boiler efficiency factor should be derived. MA is currently planning a study to understand more of these issues, DNV GL recommends National Grid in RI to follow MA and conduct similar research or piggyback with the MA effort to be cost-effective.

Considerations

C1: Boiler Hours of Use Application Review: Rather than assuming a boiler and the heating distribution system operates year-round, site staff should be interviewed to determine if the specific distribution segments impacted by steam traps or pipe/fixtures insulation measures are operated only seasonally.

C2: Boiler Efficiency: The application reviewers should use site-specific information for the efficiency of the boilers impacted by steam traps or pipe/fixtures insulation measures where information is available. A convenient approach to determine the boiler system efficiency would be to request boiler combustion test receipts.

C3: Pipe and Fitting Insulation Measure Calculator: The pipe/fitting insulation measure may benefit from a deemed calculator, like the steam trap calculator. The ex-ante savings methods were not transparent, and the evaluators could not always replicate them. A deemed calculator could provide consistent and transparent estimates of savings.

C4: EMS or Control Based Projects: For EMS/Control Based projects, consider adding another level of verification such verifying the trend data showing that the control is operating as designed or capturing screenshots of the new control software interface that shows the actual setpoints, or some other meaningful form of documentation to ensure control based claimed savings are operational. Better documentation of the pre-existing conditions with pictures or trend data would help validate savings.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
R1: *Impact Evaluation of PY2018 Custom Gas Installations* was completed subsequent to the completion of this study; those results will be applied to calculate claimable savings for 2021, so the realization rate determined by this study will not be directly applied. The results of this study were incorporated into *Impact Evaluation of PY2018 Custom Gas Installations* by way of the three-year rolling evaluation effort.

R2: The subsequent custom gas study stratified between steam trap and non-steam trap projects in order to account for the discrepancy seen in the results. The Company will follow the efforts of the MA jurisdiction to further investigate this issue.

C1: National Grid will adopt this consideration.

C2: National Grid will adopt this consideration.

C3: National Grid will review the feasibility of adopting this consideration.

C4: National Grid will review the feasibility of adopting this consideration.

Savings Impact: As discussed above, the results of a subsequent study superseded the final results of this study; the final results of this study (PY2017) feed into the cumulative estimated reported in the subsequent study (PY2018). The results from PY2017 only would increase the claimable savings for custom gas measures installed in 2021, while the cumulative results from PY2016, PY2017, and PY2018 will slightly decrease claimable savings for custom gas measures installed in 2021.

RI-20-CG-CustGasPY18 - Impact Evaluation of PY2018 Custom Gas Installations

Type of Study: Impact

Evaluation Conducted by: DNV GL

Date Evaluation Conducted: Interim results presented August 2020

Evaluation Objective and High-Level Findings:
The objective of this impact evaluation was to provide verification or re-estimation of energy (therms) savings for a sample of custom gas projects through site-specific inspections, end-use monitoring, and analysis. The site-specific results were aggregated to determine realization rates for National Grid's custom gas installations in RI.

Parameter	PY2016	PY2017	PY2018	PYs 2016+2017	Recommended Combined Results: PYs 2016+2017+2018
Tracking Savings	1,114,770	1,948,383	2,847,751	4,796,134	5,910,904
Sample Size	8	6	6	12	20
RR	71.3%	92.0%	83.3%	87.1%	84.2%
Relative precision@ 80% CI	±10.6%	±2.3%	±22.6%	±13.5%	±11.1%

Due to onsite restrictions resulting from COVID-19, measurement and verification was completed for only six of the eight sites in the original sample. For the remaining two sites, desk reviews of available documentation were performed. Results for PY2018 are based on a combination of the full measurement and verification for six sites and desk reviews for two sites. Measurement and verification will be completed for the remaining two sites in fall 2020 if feasible.

The original sample was designed to estimate the overall realization rate of the program by combining results from three program year evaluation studies (PYs 2016, 2017, and 2018) to achieve reliable relative precisions.

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

Evaluation Recommendations included in the study:
DNV GL recommends applying the combined result from PYs 2016-2018 of 84.2% RR for 2021 planning. If feasible to complete measurement and verification at the final two sites, this result should be updated and applied prospectively to 2021 program year projects.

Other recommendations will be produced when the study is finalized.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid adopted the results of this study.

Savings Impact:
The results of this study will result in a slight decrease in claimable savings from Large Commercial Custom Gas projects.

RI-19-CE-CustElec - Impact Evaluation of PY2018 Custom Electric Installations

Type of Study: Impact

Evaluation Conducted by: DNV GL

Date Evaluation Conducted: Interim results presented August 2020

Evaluation Objective and High-Level Findings:
The objective of this impact evaluation was to provide verification or re-estimation of energy (kWh) savings for a sample of custom electric projects through site-specific inspections, end-use monitoring, and analysis. The site-specific results were aggregated to determine realization rates for National Grid's custom electric installations in RI.

Lighting

Parameter	RI		MA	Combined Results	Recommended Combined Results
	PY2016	PY2018	PY 2017/18	PYs 2016+2018	RI (PY2016+ PY2018)+MA PY2017/18
Tracking Energy Savings (kWh)	19,142,741	13,294,077	40,309,720	32,436,818	72,746,538
Sample Size	3	10	10	13	23
RR	99.9%	83.5%	94.3%	93.2%	93.8%
Relative precision@ 90% CI	±5.6%	±17.2%	±19.4%	±7.8%	±11.3%

Non-Lighting

Parameter	RI		MA	Combined Results	Recommended Combined Results
	PY2016	PY2018	PY 2017/18	PYs 2016+2018	RI (PY2016+ PY2018)+MA PY2017/18
Tracking Energy Savings (kWh)	21,044,847	12,910,679	45,495,306	33,955,526	79,450,832

Sample Size	8	14	21	22	43
RR	69.3%	79.9%	70.8%	73.4%	71.9%
Relative precision@ 90% CI	±23.0%	±11.2%	±21.9%	±14.9%	±14.1%

Due to onsite restrictions resulting from COVID-19, no onsite work was completed for PY2018 sites; only desk reviews of available documentation were performed. These results were combined with full measurement and verification results from RI PY2016 and MA PY 2017-19. Measurement and verification will be completed for RI PY2018 sites in fall/winter 2020 if feasible.

The original sample was designed to estimate the overall realization rate of the program by combining results from three program year evaluation studies (RI PY2016, MA PY2017-18, and RI PY2018) to achieve reliable relative precisions.

Programs to which the Results of the Study Apply:
Electric—Large Commercial New Construction
Electric—Retrofit

Evaluation Recommendations included in the study:
DNV GL recommends applying the combined result of 93.8% RR for lighting and 71.9% RR for non-lighting for 2021.

Other recommendations will be produced when the study is finalized.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid adopted the results of this study.

Savings Impact:
The results of this study will result in a decrease in claimable lighting savings and an increase in claimable non-lighting savings from Large Commercial Custom Electric projects.

MA-19C03-E-SBIMPCT - Impact Evaluation of 2017 Small Business Electric Installations

Type of Study: Impact

Evaluation Conducted by: DNV GL and DMI

Date Evaluation Conducted: March 20, 2020

Evaluation Objective and High-Level Findings:
The purpose of this study was to provide annual energy kWh savings and realization rates, summer and winter peak kW realization rates, and lifetime kWh realization rates for HVAC and refrigeration measures installed through the small business program in the 2017 program year. Additional objectives include providing the primary drivers of the annual energy savings, establishing the proper baselines for lifetime savings (including dual baselines), and providing recommendations on how to apply study results.
The study provides the following key findings:

1. Overall, the HVAC and refrigeration measures studied are performing well and delivering meaningful savings for participants and program administrators. At the program level, the tracking estimates of annual energy impacts were observed to be reasonably accurate with realization rates of near 90% for both refrigeration and HVAC measures.
2. Among the HVAC sample, the performance of franchise sites and non-franchise sites were very different from one another. The divergent performance of these sites and the handling of franchise sites in different programs by different PAs drove the need for a combined refrigeration and non-franchise HVAC set of results and overall refrigeration and HVAC results. These results are provided below.

Impact Result Summary

Results	Energy (kWh)	Summer (kW)	Winter (kW)
Combined Refrigeration and HVAC			
Tracked savings	7,376,462	612	551
Statewide evaluated savings	6,979,214	774	779
Realization rate	94.6%	126.5%	141.5%
Relative precision	±20.6%†	33.9%*	37.0%*
Combined Refrigeration and non-franchise HVAC			
Tracked savings	5,480,531	612	551
Statewide evaluated savings	5,751,339	576	647

Realization rate	104.9%	94.1%	117.4%
Relative precision	19.1%†	28.1%*	31.7%*

† provided at the 90% confidence interval * Provided at the 80% confidence interval

1. Summer and winter peak kW savings are not being fully populated in tracking estimates of small business projects, as evidenced by instances of either blank or zero savings in these categories among the samples examined. This appears to be an issue among both HVAC and refrigeration measures, particularly among the franchise sites.
2. Lifetime savings are similarly not tracked regularly. Approximately 52% of HVAC sites in the population and 11% of refrigeration sites in the population had annual savings estimates without an accompanying lifetime estimate, though we found reasonably accurate use of lifetime values when present.
3. The 2015 NEEP Commercial Refrigeration Loadshape Report contains the conclusion that EC motors use 61% less power than shaded-pole motors, on average, compared to the MA TRM value of 65%. The MA TRM cites a 2007 study to support the 65% reduction. The NEEP study is the more recent study and is based on a larger sample size of pre/post measurements, so the 61% reduction appears to be a better value to represent average power reductions for this measure type.

Programs to which the Results of the Study Apply: Electric—Small Business Non-Lighting

Evaluation Recommendations included in the study:
Recommendation 1: Use the retrospective and prospective realization rates as provided in the table below with two important notes:

1. Application of the prospective energy savings realization rates are dependent on implementation of the recommended calculation change in the MA TRM regarding a new adjustment factor that reflects shaded pole motor power when only EC motor power is measured (recommended below).
2. Due to missing tracking summer peak kW and winter peak kW estimates in both the HVAC and refrigeration samples influencing the realization rate around these results, we do not recommend a prospective realization rate for these items. The concern is that such realization rates will not be appropriate for application when summer and winter values are fully populated.

Factor	Retrospective	Prospective
Combined refrigeration and HVAC applied when franchise served in Turnkey (Eversource, Unitil)		
Energy Realization rate (kWh)	94.6%	94.8%
Summer peak kW Realization Rate	126.5%	N/A

Winter peak kW Realization Rate	141.5%	N/A
Combined refrigeration and non-franchise HVAC applied when franchise not served in Turnkey (National Grid, Cape Light Compact)		
Energy Realization rate (kWh)	104.9%	105.2%
Summer peak kW Realization Rate	94.1%	N/A
Winter peak kW Realization Rate	117.4%	N/A

Recommendation 2: Revise the MA TRM to accommodate a demand reduction factor of 61% in its calculation when replacing shaded pole motors with ECM motors.
Recommendation 3: Work with program vendors to ensure that summer and winter peak demand estimates are fully populated in the tracking system when appropriate.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study: In RI, National Grid adopted the prospective non-franchise realization rates and will adopt recommendations 2 and 3.

Savings Impact: The application of this study results in a decrease in claimable non-lighting electric savings for this program.

MA-19C02-B-EUL - C&I Measure Life Study

Type of Study: Impact

Evaluation Conducted by: DNV GL

Date Evaluation Conducted: March 31, 2020

Evaluation Objective and High-Level Findings:
The purpose of this study was to inform Effective Useful Lives ("EULs") and Remaining Useful Lives ("RULs") for key C&I energy efficiency measures, including lighting, HVAC, custom projects, and gas heating equipment.

Programs to which the Results of the Study Apply: Gas—Large Commercial

Evaluation Recommendations included in the study:
Recommendation 1: Keep the EUL for commercial unitary HVAC equipment at 12 years. When the EUL for commercial unitary HVAC equipment was reduced from 15 to 12 years in 2018 in response to the EUL analysis conducted under Project 73 Track D, the reduction was conditional on improvements in the EUL analysis method that were to be conducted in 2019. The revised EUL analysis conducted under Project MA19C02-B-EUL did estimate EULs that were slightly higher (9-10 years) than those estimated under Project 73 Track D (6-8 years).

However, the updated estimates are still lower than the current TRM EUL of 12 years. The improved EUL estimation method still has some limitations as discussed in the detailed findings of this report. For this reason, the evaluation team is not advocating it be reduced below 12 years. However, the team believes that the 9-10-year EULs that emerged from the improved 2019 analysis also suggest that this EUL should not revert to the 15-year estimate that was used prior to 2018.

Recommendation 2: Keep the EUL for commercial furnaces at 18 years. The HVAC contractors estimated the average age of the commercial furnaces they removed which still had some useful life remaining to be 17 years. They estimated the average age of the commercial furnaces they removed which were at or near failure to be 19 years. Since the 19-year average is close to the current EUL in the TRM of 18 years, the evaluation team recommends that this EUL remain unchanged.

Recommendation 3: Reduce the EUL for commercial boilers to 20 years. As noted, the HVAC contractors estimated the average age of the commercial boilers they removed with some useful life remaining at 19 years. They estimated the average age of the commercial boilers they removed that were at or near failure to be 22 years. Both these estimates are below the current EUL in the Massachusetts TRM of 25 years.

Recommendation 4: Change the assumed ER rate for commercial boilers from 0% to 20% and for commercial furnaces from 0% to 15%. As noted, this study found an ER rate of 21% for commercial boilers and 20% for commercial furnaces. Another recent Massachusetts study which involved interviews with both HVAC contractors and end users found an ER rate of 18% for commercial boilers and 11% for commercial furnaces. Since two different evaluation studies have come out with similar results that are well above the default assumption of 0%, the team recommends that the PAs should change this ER rate to 20% for commercial boilers and 15% for commercial furnaces, which is the average of the ER rates from the two studies.

Recommendation 5: The impact evaluation team should continue reviewing site-specific EUL assumptions. The impact evaluation team should continue to provide meaningful feedback regarding EUL assumptions observed at individual sites and communicate those findings through the Monthly BAG meetings with stakeholders and in the final evaluation report.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study: In RI, National Grid will adopt recommendations 1 through 3 and will follow additional work on recommendations 4 and 5. A study is in progress in MA to incorporate the results outlined in recommendation 4; RI will review this study for applicability when finalized.

Savings Impact: The application of these results will result in a reduction in claimable lifetime savings for Large Commercial Gas.

RI-20-CX-FRSO - C&I Free-Ridership and Spillover Study

Type of Study: Market

Evaluation Conducted by: Tetra Tech

Date Evaluation Conducted: September 2020 (draft)

Evaluation Objective and High-Level Findings:
The goal of this study was to identify:

- both pure and partial free-ridership, through customer survey;
- "like" participant spillover, through customer survey;
- indicators of "unlike" participant spillover, through customer survey;
- nonparticipant "like" spillover, through survey of participating design professionals and vendors.

Electric Results

Program	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)*	Participant "Like" Spillover Rate	90% Margin Error (±)*	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	91	2,642	16,909,798	31.2%	7.9%	0.3%	0.9%	NA	69.1%
	Lighting—screw-ins	34	711	6,389,077	76.9%	11.6%	0.2%	1.2%	NA	23.3%
	Lighting—TLEDs	28	791	4,672,299	54.9%	15.2%	0.0%	0.0%	NA	45.1%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Design 2000plus Program	Compressed Air	6	22	358,959	28.0%	Census	2.1%	Census	1.6%	75.7%
	Custom	9	76	11,253,874	28.0%	Census	2.1%	Census	1.6%	75.7%
	Food Service	6	60	503,856	28.0%	Census	2.1%	Census	1.6%	75.7%
	HVAC Non-unitary	1	5	328,220	28.0%	Census	2.1%	Census	1.6%	75.7%
	Lighting	4	46	3,657,323	28.0%	Census	2.1%	Census	1.6%	75.7%
	Other	0	1	820	NA	NA	NA	NA	NA	NA
	VSD	1	5	173,930	28.0%	Census	2.1%	Census	1.6%	75.7%
	Total	**27**	**215**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Energy Initiative	Custom	16	133	27,267,088	35.8%	Census	0.5%	Census	0.7%	65.5%
	HVAC	1	18	800,818	14.7%	Census	0.1%	Census	0.1%	85.5%
	Lighting	35	311	29,793,677	14.7%	9.3%	0.1%	0.7%	0.1%	85.5%
	VSD	5	29	2,652,783	14.7%	Census	0.1%	Census	0.1%	85.5%
	Total	**57**	**491**	**60,514,366**	**23.8%**	**8.7%**	**0.3%**	**1.1%**	**0.9%**	**77.3%**
Small Business program	Lighting	71	640	10,206,033	12.3%	6.1%	0.3%	1.1%	0.2%	88.2%
	Non-lighting	42	339	1,978,580	29.1%	10.8%	0.3%	1.3%	0.0%	71.2%
	Total	**113**	**979**	**12,184,613**	**15.1%**	**5.2%**	**0.3%**	**0.8%**	**0.2%**	**85.5%**
Total		**350**	**5,829**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

*When a census of the population is sampled, confidence intervals cannot be estimated.
Cells highlighted in gray are using the overall program, or custom/prescriptive level, freeridership and spillover rates due to insufficient number of responses or low precision.
A value of NA means no surveys were completed for that stratum.
Program measures with no program participation are not shown.

Program	Program Type	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Prescriptive	153	4,144	27,971,174	39.3%	6.4%	0.2%	0.6%	NA	60.9%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Design 2000plus	Custom	9	76	11,253,874	28.0%	Census	2.1%	Census	1.6%	75.7%
	Prescriptive	18	139	5,023,108	28.0%	Census	2.1%	Census	1.6%	75.7%
	Total	**27**	**215**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Energy Initiative	Custom	16	130	26,066,973	35.8%	Census	0.5%	Census	0.7%	65.5%
	Prescriptive	41	361	34,447,393	14.7%	8.6%	0.1%	0.6%	0.1%	85.5%
	Total	**57**	**491**	**60,514,366**	**23.8%**	**8.7%**	**0.3%**	**1.0%**	**0.9%**	**77.3%**
Small Business	Prescriptive	113	979	12,184,613	15.1%	5.2%	0.3%	0.8%	0.2%	85.5%
	Total	**113**	**979**	**12,184,613**	**15.1%**	**5.2%**	**0.3%**	**0.8%**	**0.2%**	**85.5%**
Total	**Custom**	**25**	**206**	**37,320,847**	**33.4%**	**14.5%**	**0.4%**	**1.9%**	**1.6%**	**68.6%**
	Prescriptive	**325**	**5,623**	**79,626,288**	**26.7%**	**3.9%**	**0.6%**	**0.7%**	**1.2%**	**75.0%**
	Total	**350**	**5,829**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

*When a census of the population is sampled, confidence intervals cannot be estimated.

Cells highlighted in gray are using the overall program freeridership and spillover rates due to insufficient number of responses.

Gas Results

Program	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)*	Participant "Like" Spillover Rate	90% Margin Error (±)*	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Commercial New Construction—Custom	Controls	0	9	34,546	NA	NA	NA	NA	NA	NA
	Food service	1	3	12,017	47.7%	Census	2.2%	Census	3%	57.6%
	HVAC	2	3	21,267	47.7%	Census	2.2%	Census	3%	57.6%
	HVAC—Distribution	0	3	72,497	NA	NA	NA	NA	NA	NA
	HVAC—Plant	0	3	21,737	NA	NA	NA	NA	NA	NA
	Insulation	1	4	33,175	47.7%	Census	2.2%	Census	3%	57.6%
	Water Heating	2	10	82,333	47.7%	Census	2.2%	Census	3%	57.6%
	Other	0	1	3,640	NA	NA	NA	NA	NA	NA
	Total	**6**	**36**	**281,212**	**47.7%**	**Census**	**2.2%**	**Census**	**3%**	**57.6%**
Commercial New Construction—Prescriptive	Food service	38	172	120,223	47.7%	Census	2.2%	Census	3%	57.6%
	HVAC	5	5	7,469	47.7%	Census	2.2%	Census	3%	57.6%
	HVAC—Plant	0	27	18,045	NA	NA	NA	NA	NA	NA
	Other	1	1	3,429	47.7%	Census	2.2%	Census	3%	57.6%
	Water heating	5	116	47,213	47.7%	Census	2.2%	Census	3%	57.6%
	Total	**49**	**321**	**196,380**	**47.7%**	**Census**	**2.2%**	**Census**	**3%**	**57.6%**
Large Commercial Retrofit— Custom	Controls	2	36	227,664	6.8%	Census	0.0%	Census	16%	108.8%
	HVAC	5	40	481,331	6.8%	Census	0.0%	Census	16%	108.8%
	HVAC—Distribution	0	5	35,632	NA	NA	NA	NA	NA	NA
	HVAC—Plant	0	4	48,005	NA	NA	NA	NA	NA	NA
	Insulation	5	15	125,199	6.8%	Census	0.0%	Census	16%	108.8%
	Other	1	16	662,531	6.8%	Census	0.0%	Census	16%	108.8%
	Water heating	2	6	27,611	6.8%	Census	0.0%	Census	16%	108.8%
	Total	**15**	**122**	**1,607,973**	**6.8%**	**Census**	**0.0%**	**Census**	**16%**	**108.8%**
Large Commercial Retrofit—Prescriptive	Controls	0	10	2,122	NA	NA	NA	NA	NA	NA
	Other	0	1	6,669	NA	NA	NA	NA	NA	NA
	Water Heating	0	4	1,374	NA	NA	NA	NA	NA	NA
	Total	**0**	**15**	**10,165**	NA	NA	NA	NA	NA	NA
Small Business program—Custom	Controls	0	4	418	NA	NA	NA	NA	0%	NA
	Custom	1	14	2,091	11.4%	Census	1.7%	Census	0%	90.4%
	Insulation	0	1	105	NA	NA	NA	NA	NA	NA
	Other	1	11	1,285	11.4%	Census	1.7%	Census	0%	90.4%
	Water heating	0	10	1,516	NA	NA	NA	NA	NA	NA
	Total	**2**	**40**	**5,415**	**11.4%**	**Census**	**1.7%**	**Census**	**0%**	**90.4%**
Small Business program—Prescriptive	Controls	9	26	3,480	11.4%	Census	1.7%	Census	0%	90.4%
	Insulation	1	3	2,345	11.4%	Census	1.7%	Census	0%	90.4%
	Water heating	6	62	18,139	11.4%	Census	1.7%	Census	0%	90.4%
	Total	**16**	**91**	**23,963**	**11.4%**	**Census**	**1.7%**	**Census**	**0%**	**90.4%**
Total		**88**	**625**	**2,125,108**	**16.1%**	**Census**	**0.5%**	**Census**	**2%**	**86.6%**

*When a census of the population is sampled, confidence intervals cannot be estimated.

Cells highlighted in gray are using the overall program, or custom/prescriptive level, freeridership and spillover rates due to insufficient number of responses or low precision.

A value of NA means no surveys were completed for that stratum.

Program measures with no program participation are not shown.

Program	Program Type	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Commercial New Construction	Custom	6	36	281,212	47.7%	Census	2.2%	Census	3%	57.6%
	Prescriptive	49	321	196,380	47.7%	Census	2.2%	Census	3%	57.6%
	Total	**55**	**357**	**477,592**	**47.7%**	**Census**	**2.2%**	**Census**	**3%**	**57.6%**
Large Commercial Retrofit	Custom	15	122	1,607,973	6.8%	Census	0.0%	Census	16%	108.8%
	Prescriptive	0	15	10,165	NA	NA	NA	NA	NA	NA
	Total	**15**	**137**	**1,618,138**	**6.8%**	**Census**	**0.0%**	**Census**	**16%**	**108.8%**
Small Business	Custom	2	40	5,415	11.4%	Census	1.7%	Census	0%	90.4%
	Prescriptive	16	91	23,963	11.4%	Census	1.7%	Census	0%	90.4%
	Total	**18**	**131**	**29,378**	**11.4%**	**Census**	**1.7%**	**Census**	**0%**	**90.4%**
Total	Custom	23	198	1,894,601	11.7%	Census	0.2%	Census	8%	96.3%
	Prescriptive	65	427	230,508	54.4%	Census	3.4%	Census	1%	50.0%
	Total	**88**	**625**	**2,125,108**	**16.1%**	**Census**	**0.5%**	**Census**	**2%**	**86.6%**

*When a census of the population is sampled, confidence intervals cannot be estimated.

Cells highlighted in gray are using the overall program freeridership and spillover rates due to insufficient number of responses or low precision.

A value of NA means no surveys were completed for that stratum.

Programs to which the Results of the Study Apply:
All C&I. Results were applied with the following levels of aggregation:

Electric

- Upstream Lighting: fixtures, fixtures with controls, LED retrofit kits
- Upstream Lighting: screw-ins
- Upstream Lighting: TLEDs
- New Construction
- Retrofit Prescriptive
- Retrofit Custom
- Small Business Lighting
- Small Business Non-Lighting

Gas

- New Construction
- Retrofit
- Small Business

Evaluation Recommendations included in the study:
Recommendations to be provided in final draft.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
Recommendations will be considered by National Grid and adopted whenever feasible.

Savings Impact: The application of this study reduced claimable savings.

RI-18-XX-Piggybacking - Piggybacking Diagnostic Study

Type of Study: Process

Evaluation Conducted by: DNV GL

Date Evaluation Conducted: January 14, 2020

Evaluation Objective and High-Level Findings:
The primary objective of this study is to develop guidance on when it is appropriate to "piggyback" or combine RI evaluation efforts with MA studies or adopt MA results as a proxy for RI versus stand-alone RI studies. The report recommends which approaches National Grid should use for commercial and industrial (C&I) measure groups and residential programs.

Piggybacking Approaches: Basic Descriptions

Approach Number	Approach Name	Description
1	Direct Proxy	Use MA results directly for RI
2	Shared Algorithm	Calculate savings using data collection results from MA, applied to an independent RI sample using similar formulas
3	Pooled Sample	Collect data from MA and RI sites. Create a sample from both MA and RI so that the combined sample is large enough to meet precision requirements in RI
4	Independent Sample	Conduct data collection and analysis on an independent RI sample using the same tools as MA
5	Independent Study	Conduct a completely independent study that leverages nothing directly from MA

These approaches follow a loose hierarchy of decreasing assumptions and increasing rigor as one moves from Approach 1 to Approach 5. As such, using a higher numbered approach in lieu of a lower numbered approach is usually possible and remains technically sound. In particular, any other approach could replace Approach 1. Approach 5 could be used instead of Approach 4, which could be used instead of Approach 3.

Programs to which the Results of the Study Apply:
All programs

Evaluation Recommendations included in the study:

Recommended Approaches: C&I Measure Groups

Measure Group	Recommended Approach
Prescriptive Lighting	**Approach 4** – Independent Sample or **Approach 5** – Independent Study
Upstream Lighting	**Approach 4** – Independent Sample
Custom Electric Non-lighting	**Approach 4** – Independent Sample
Custom Electric Lighting	**Approach 4** – Independent Sample
Small Business Electric	**Approach 3** – Pooled Sample, with adjustments for participants Or **Approach 1** – Direct Proxy if limited to non-lighting
Prescriptive Non-lighting	**Approach 4** – Independent Sample or **Approach 3** – Pooled Sample if done on individual measure types
Custom Gas	**Approach 4** – Independent Sample
Prescriptive Gas	Insufficient evidence to make strong recommendation

Recommended Approaches: Residential Programs

Program	Recommended Approach
Lighting	**Approach 4** – Independent Samples **or** **Approach 2** – Shared Algorithm (with adjustments)
Behavioral Programs	**Approach 4** – Independent Samples **or** **Approach 5** – Independent Studies
EnergyWise Single Family	**Approach 4** – Independent Samples **or** **Approach 5** – Independent Studies **or** **Approach 3** – Pooled Sample (if no billing analysis & next study shows similar results for RI and MA)
Residential Cooling & Heating	Insufficient evidence to make strong recommendation
Consumer Products	Appliance Recycling: Approach 2 – Shared Algorithm **or** **Approach 3** – Pooled Sample (if field data collection used) Other Measures: **Approach 1** – Direct Proxy

Income Eligible Single Family	**Approach 4** – Independent Samples **or** **Approach 5** – Independent Studies; Approaches 1, 2, or 3 (if next study has similar results for RI and MA)
EnergyWise Multi-family	**Approach 4** – Independent Samples **or** **Approach 2** – Shared Algorithm (if not using billing analysis)
New Construction, Code Compliance, and Building Characteristics	**Approach 4** – Independent Samples **or** **Approach 5** – Independent Studies
Demand Response Programs	**Approach 4** – Independent Samples **or** **Approach 3** – Pooled Samples (if small participant population or constrained data)

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study: National Grid adopted the results of this study and will follow recommended guidelines where budget allows.

Savings Impact: This study has no direct impact on claimable savings.

RI-19-XX-DataCollect - Primary Data Collection for Potential Study

Type of Study: Market

Evaluation Conducted by: DNV GL

Date Evaluation Conducted: March 9, 2020

Evaluation Objective and High-Level Findings:
This study was designed to help RI Office of Energy Resources and National Grid better understand the state's existing C&I building and equipment stock, support the efficiency potential study and lighting baseline determination, and otherwise identify ways to expand RI statewide energy efficiency initiatives.

The study's goal was to conduct comprehensive on-site assessments of C&I facilities across the state of RI with representation among relevant business types. The study focused on understanding the highest priority electric and natural gas end uses, based on stakeholder feedback and annual energy efficiency program savings. The following end uses were included in this study: lighting, HVAC and motor/drive on the electric side and HVAC, including steam traps and boilers and hot water on the gas side.

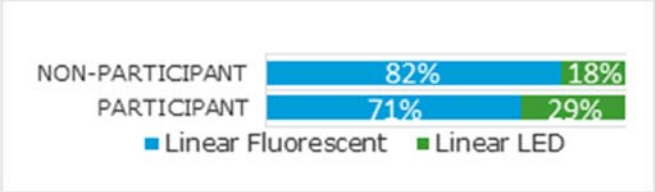
Summary of Final Population Frame

Business Size	% Consumption
Small: <500 MWh	31%
Medium: 500 - 4,500 MWh	36%
Large: >4,500 MWh	33%
TOTAL (27,508 C&I accounts)	**100% (3,503,559 kWh)**

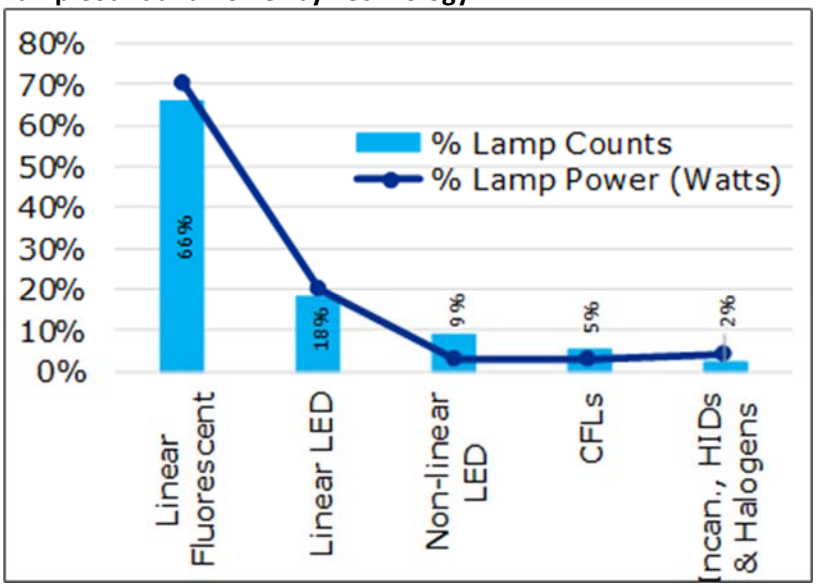
Lighting Equipment Key Findings:
7.6 million lamps operating in RI

1. 1.4M Linear LEDs
2. 4.9M Linear Fluorescents
3. 0.7M Non-linear LEDs
4. 0.4M CFLs

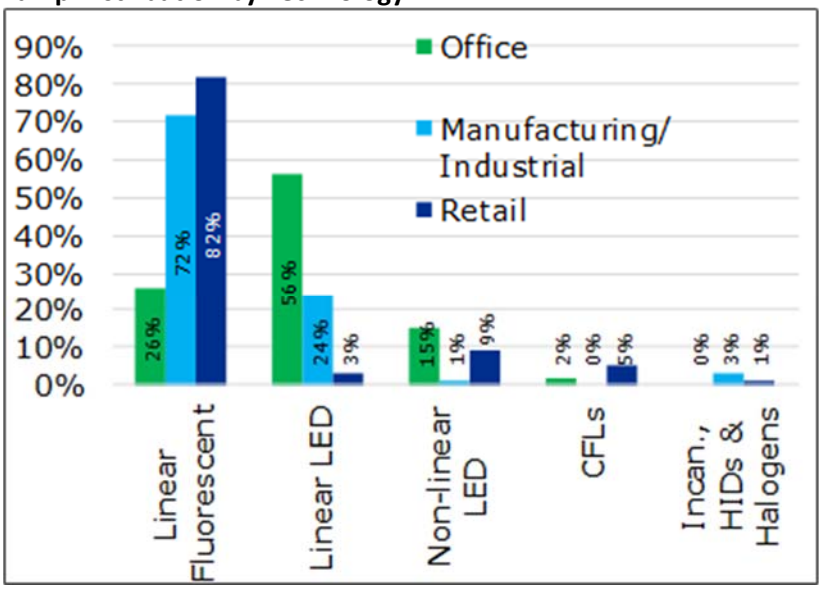
Linear Lighting Program Participation



Lamp Count and Power by Technology



Lamp Distribution by Technology



Lighting Opportunities

- 66% of lamps are fluorescent technologies, providing an opportunity to convert them to LEDs for more energy savings.
- Manufacturing/Industrial and Retail businesses have large opportunities (>70%) to install LEDs while office have about 26%.
- RI has a lot of potential for savings from installing controls for lighting equipment, such as occupancy sensors, daylighting sensors, timers, and dimming. Nearly 90% of the interior lighting is controlled manually.

Non-Lighting Equipment Key Findings

153k Cooling Systems:

- 61% were split or packaged air conditioners
- 28% were packaged terminal or window units
- 11% were heat pumps

79k Heating Units:

- 39% were packaged furnaces
- 14% were hot water or steam boilers
- 23% were Baseboard/Unit Space heaters
- 24% were packaged terminal or window units and heat pumps

52k Domestic Hot Water (DHW) Heaters:

- 86% are Storage water heaters.
- 13% are Instantaneous systems
- 1% use central plants/heat exchangers.
- 72% of the DHWs use non-electric fuels like natural gas, propane, etc.

Non-Lighting Opportunities

- 66% of the packaged AC and heat pumps were below federal standard efficiency.
- Nearly 21% of all heating systems are below federal efficiency standards.

Programs to which the Results of the Study Apply:
All C&I

Evaluation Recommendations included in the study:
This study did not produce any recommendations.

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

Savings Impact: This study has no direct impact on claimable savings.

MA-19DR01-E 2019 Residential Wi-Fi Thermostat Direct Load Control Offering Evaluation

Type of Study: Impact/Process

Evaluation Conducted by: Guidehouse

Date Evaluation Conducted: April 1st, 2020

Evaluation Objective and High-Level Findings:
This evaluation's objectives included verifying that the 2019 residential Wi-Fi thermostat direct load control (DLC) solution successfully enables demand reductions (and if so, by how much) and assessing the customer experience and acceptance of the solution. These objectives were achievable through the investigation of several research questions relating to 1) Customer Experience, 2) DR Impacts, and 3) Program Design and Implementation. Where appropriate, these research questions were explored by PA (i.e., Eversource MA and CT, National Grid MA, and Unitil MA). The evaluation also sought to compare select metrics for this National Grid offering across 2016 to 2019.

The key findings are summarized below:

- **Overall, 96% of thermostats that enrolled since September 30, 2018 remained enrolled through the end of the evaluated 2019 DR season.** The rate of sustained enrollment for thermostats enrolled after September 30, 2018 was 94% for National Grid.
- **The annualized rate at which thermostats leave the ConnectedSolutions offering ("annualized attrition") ranges from 5 to 11% per year.** For National Grid, annual attrition ranges from 6% to 10% depending on the period of enrollment, reflecting National Grid's device management plan. However, for National Grid, implementation vendor transitions impact the ability to fully analyze the extent to which thermostats have left the programs over time.
- **Across all PAs and cohorts, more than 85% of survey respondents reported that they are likely or very likely to participate again in the future.** Respondents were generally satisfied with event characteristics in 2019, including the number, length, and timing of events.
- **Bill savings is a perceived offering benefit.** Bill savings is the most commonly cited motivation for participating, including among returning National Grid customers. Although this offering achieved energy savings in 2019, the primary goal of the offering is to achieve peak demand reductions. As a result, any given participant may or may not experience bill savings by participating in the offering. The perception that participation will lead to bill savings may be a consequence of co-marketing the offering with Wi-Fi thermostat rebates.

- **55% of respondents were satisfied with the mode of notification received.** Overall, approximately 73% of survey respondents reported receiving event notification, and 75% of these respondents received their preferred mode of notification.
- **About 20% of respondents would like more flexibility in terms of how they are notified of events.** 25% of respondents *who reported receiving event notifications* would like to receive a different mode of event notification than what they received in 2019. Of these, a majority would like notifications by email.
- **Overall 17% of respondents reported not receiving event notifications and 10% were unsure whether or not they received event notifications. A**bout 62% of National Grid new participant respondents and 70% of National Grid returning participant respondents reported receiving advance notifications. The remaining participants either reported receiving no event notification or they were unsure whether or not they received notifications National Grid elected not to send advance notification emails. For device types where email notification was an option the PAs could select, participants that received event notifications *only* through the thermostat provider's app had lower rates of event notification recall than those who also received an email. For respondents who reported not receiving any event notification, a majority would like to receive email notification, at a minimum.
- **Approximately two-thirds of participants reported noticing temperature changes during events but only 40% reported ever opting out**. Most of those who reported having opted out stated that they did so only sometimes (30-40%) or rarely (50-65%). When looking at thermostat telemetry data, the percentage of devices that opted out at least once over the course of the season, and the frequency with which they opted out, is somewhat higher than what survey respondents reported. Notably, 16% of National Grid returning participants reported not knowing if they ever opted-out of an event. Relatedly, over 40% of survey respondents indicated they did not recall pre-cooling happening prior to events. In open-ended feedback, three respondents noted that it was too easy to override events inadvertently.
- **Approximately 10% of survey respondents are interested in seeing changes to or the ability to customize offering design parameters.** Some survey respondents would like to see changes to or to be able to specify their preferences related to: pre-cooling temperature adjustment and/or duration (26), event duration and/or timing (16), event setpoint maximum (3). Three survey respondents would like to be able to opt back into the event after opting-out.

Thermostat Usage Assessment Findings

- **2019 full participation rates exceeded 50% on average and across the season with** National Grid MA at 52%. The primary reason for devices not fully participating in events was not being in cooling mode.
- **A significant number of devices were never in cooling mode for any event.** National Grid MA stem from devices that were in system off/heat mode for the entire season.

- **Connectivity was a small issue overall during events for National Grid MA.** A large portion of connectivity issues stem from devices that were disconnected for the entire season.
- **Participants exhibited no evidence of event participation fatigue (increased opt-out rates) due to back-to-back events or a higher event dispatch frequency.** Devices in the experimental design groups participated at similar rates regardless of the number of events for which they were dispatched.

Impact Analysis Findings

- **National Grid had average treatment effects for the 2019 season of 0.59 kW per thermostat.**
- **As a percent of baseline usage, average demand savings was 59% for National Grid.** For National Grid, this reduction in cooling load is slightly higher than 2018 (likely due to the higher temperature setback during events), but consistent with the previous two implementation seasons.
- **Fully participating devices have average event savings across the 2019 season that are over 35% higher than the average across all dispatched participants.** Impacts for full participants show the technical potential of the offering. As opt-outs and other forms of non-participation are reduced, average and total event impacts should increase.
- **National Grid's average demand savings per event in 2019 was 0.59 kW, a decrease from the average savings found in 2018 (0.71 kW).** The lower savings likely stem from the later event times and the fewer number of event days exceeding 90°F in 2019 compared to 2018, which resulted in a lower baseline cooling load.

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

Evaluation Recommendations included in the study:

Recommendation 1: Unenroll thermostats from the offering that frequently opt out of events, do not have connectivity, and/or are consistently in a non-cooling mode. This will lower the costs of the Direct Load Control Offering and increase average savings per thermostat. In parallel, ensure that the enrollment tracking system allows for the tracking of unenrollment reasons related to the opt outs, connectivity and AC system mode behavior.

Recommendation 2: Include the count of all residential and non-residential devices and participants enrolled as of August 31 in the Massachusetts ADR BCR model. For 2019, the count of thermostats is 11,503 for National Grid MA. The count of participants is 7,814, and 45 for National Grid MA.

Recommendation 3: Calculate ex-post savings by applying the savings adjustment factor to vendor-reported savings. Use ex-post savings for claiming savings in 2019 and in future years. For the event period, the savings adjustment factor is an equation based on average outdoor temperature: -3.06 + (0.05 x Avg Temp °F). For pre-cooling and recovery hours, the savings adjustment factors are constants, 0.72 and 0.68, respectively.

The adjustment factor can apply when the ISO-NE or PJM baseline is used, pre-cooling and event duration conditions are met, the assumed AC nameplate capacity continues to be 3.5 kW in the

EnergyHub portal, and the average outdoor temperature is 75 degrees F or higher. When these conditions are not met, the savings adjustment factor does not apply.

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

Recommendation 1: Yes, **t**his recommendation has been adopted.

Recommendation 2: No this is a specific MA recommendation and would not apply to RI.

Recommendation 3: No there were two specific savings results that came out of this study. One was using a deemed savings result and the other was applying a realization rate to vendor specified savings. RI has chosen to apply the deemed savings value from this study instead of the realization rate as this recommendation suggests.

Savings Impact:
This demand savings increased when compared to 2019 estimates.

MA-19DR02-E 2019 Residential Energy Storage Demand Response Demonstration Evaluation – Summer Season

Type of Study: Impact/Process

Evaluation Conducted by: Guidehouse

Date Evaluation Conducted: 02/10/2020

Evaluation Objective and High-Level Findings:
The purpose of this study was to assess the technical feasibility, customer acceptance, and scalability of using residential energy storage systems (battery) to reduce peak demand for National Grid as part of their broader active demand response initiatives. This study confirmed this feasibility; however, it has not looked at whether that control will be cost-effective for the electric system, program administrators, and/or customers. National Grid provided a performance incentive to customers in exchange for control of their existing battery as part of a "Bring Your Own Battery". Between July and September of 2019, National Grid called 27 events for 50 participating customers and between August 1 and September 30.

The study provides the following key findings for National Grid:

- Access to backup power is a primary motivation for purchasing a battery system.
- Survey respondents reported extremely low opt-out rates, with 94% reporting they never opted out of an event.
- Ninety-seven percent of respondents would recommend the program to other National Grid customers, and 97% are likely or very likely to continue with the program should it be offered in the future.
- Events called by National Grid during the summer season saved 139 kW per event on average, including 126 kW during the 2019 ISO-NE Peak Hour.
- Battery devices that successfully participated in 2-hour events saved an average of 5.5 kW per unit.
- On average, called events had 64% of the expected maximum impact given the maximum expected discharge of the batteries operational at the time of the event. This is affected by some batteries opting out of events and also by lower relative performance by some devices, especially DC coupled batteries.
- 50 devices participated in at least one event this season.
- Consecutive event days appeared to have a negligible effect on impacts this season. Weather had a larger effect on devices not being fully charged in time for the next event. The small effects that could be seen were instead caused by weather conditions that prevented some devices from fully charging in time for the next event.
- Successfully participating devices dispatched at a constant rate for the length of the event. This includes DC coupled batteries.

- The conventions (e.g., sign, time zone) associated with the telemetry data varied across manufacturers. Navigant made informed corrections to align the telemetry data for all devices into a single convention.

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

Evaluation Recommendations included in the study:
Recommendation 1: Ensure customers are aware National Grid knows backup is important to them. Two manufacturers include the existence of a battery reserve in their marketing materials, and one offers the option, but National Grid does not make this clear in the marketing materials. Create a consistent battery reserve level and publicize both the battery reserve and the restriction of events prior to storms. This will help alleviate customer concern about batteries being depleted when they are being relied upon to provide power in an emergency
Recommendation 2: National Grid to encourage EnergyHub to work with manufacturers and/or integrators to align all details of the telemetry data so the data fields are consistent.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
Recommendation 1: This recommendation is still under consideration.
Recommendation 2: Yes this recommendation has been implemented.

Savings Impact:
This study verified that the 5.5 kW was accurate and due to this did not have any impact on savings.

MA-19DR03-E Cross State C&I Active Demand Reduction Initiative Summer 2019

Type of Study: Impact/Process

Evaluation Conducted by: Energy & Resource Solutions (ERS)

Date Evaluation Conducted: April 15th, 2020

Evaluation Objective and High-Level Findings:
The primary objectives of the evaluation are to independently assess program initiative impact and identify process improvement opportunities. Impact is measured as both the average demand reduction during specified events and during the annual peak installed capacity (ICAP) hour. Load reduction is based on the comparison of measured load against four different alternative/baseline load scenarios. The evaluation also attempts to understand the overlap between the PA ADR initiatives and the ISO-NE Forward Capacity Market (FCM) and provide input on other opportunities for peak demand management.

Process Evaluation Findings:

- Settlement and payment: Payment processing remains challenging. Program marketing materials state that incentives will be paid out in October. When the evaluation team interviewed National Grid's staff in December of 2019, there were still several payments that had not yet been made. National Grid staff explained that the delay in payments was largely because National Grid's procurement protocols had been revised. This meant that National Grid staff had to have CSPs re-sign contracts, NDAs, and ISAs in order to process ADR initiative payments. Additionally, staff explained that each summer season, a small percentage (less than 5%) of customers experience metering or data issues that result in delayed settlement and payment. With the increase in program enrolment over the past three summers, it has become more time-consuming for staff to resolve these data issues.

- Recruitment: Recruitment for the 2019 summer season was more difficult for the PA than it had been over the first two years of the program. A significant percentage of the PA's largest commercial and industrial customers have already signed up for the program. The National Grid staff noted they had to increase their sales efforts in 2019 to achieve the same amount of MW reduction that had been reached in prior years when less resources were spent on recruiting. As can be expected with any growing PA offering, the PA anticipates this need for increased promotion to continue.

C&I Interruptible Findings (Impact Findings)
The evaluation team recommends using a symmetrically adjusted baseline (called Evaluated-Symmetric in the tables below) as the most appropriate estimate of event period load reduction for the 2019 summer season. The symmetrically adjusted baseline, with additional adjustment

for likelihood of unreported shutdowns (called Evaluated-Forecast below), is the best estimate of load reduction for future years. The symmetrically adjusted baseline reduces biases for sites with variable load due to weather or other production factors. The symmetrically adjusted baseline methodology is the most commonly used baseline approach and is used by ISO-NE. The Baselines section of the Impact Evaluation Methodology and Framework describes the baselines and their advantages and disadvantages in detail. The C&I Interruptible Impact Evaluation Findings and Integrated Impact and Process Evaluation Findings substantiate the 7 evaluator's baseline recommendation for the 2019 summer season.
Table 1-4 provides the summary of National Grid's load reduction estimates for Massachusetts. National Grid called a single event on July 30, the ICAP day.

National Grid Impact Summary – Massachusetts

Result	Event Average Reduction (kW)	ICAP Hour Reduction (kW)
Enrolled Capacity	93,134	93,134
Reported-Asymmetric	71,428	N/A
Evaluated-Validation	71,611	N/A
Evaluated-Unadjusted	42,461	36,090
Evaluated-Asymmetric	69,561	63,190
Evaluated-Symmetric	58,464	52,173
Evaluated-Forecast	57,264	51,266
Evaluated-Regression	48,752	42,538

Based on the above results, the evaluators calculated the following performance ratios. They are defined as follows:

- Enrollment Ratio: This ratio is the reported asymmetric load reduction to the CSP reported enrolled capacity. This ratio provides insight into what percentage of the reported enrolled capacity was achieved, based on the program baseline and calculation methodology. This ratio is particularly meaningful for planning and sales purposes.
- Asymmetric Ratio: This ratio is the evaluated asymmetric load reduction to the reported asymmetric load reduction. This is an apples-to-apples comparison of the same baseline methodology between the PAs and evaluators; however, this metric identifies the impact that different calculation rules between the PAs and evaluators has on load reduction.
- Retrospective Realization Rate: This ratio is the evaluated symmetric load reduction to the reported asymmetric load reduction. The evaluators determined that the symmetrically adjusted baseline is the most appropriate measure of retrospective load

reduction for the 2019 summer season. This ratio shows how the choice of baseline adjustment and calculation methodologies impacts the load reduction estimates. The evaluators recommend using this realization rate to calculate the symmetric load reductions at the end of future seasons if there are no evaluations conducted.

- Prospective Realization Rate: This ratio is the evaluated symmetric load reduction with an adjustment for unreported shutdowns to the reported asymmetric load reduction. The evaluators determined that the symmetrically adjusted baseline accounting for unreported shutdowns is the most appropriate measure of prospective load reduction for future seasons. This ratio provides insight into the magnitude of reductions that could be achieved during future seasons as a function of the validated load reduction estimates. The prospective realization rate should only be used as an ex-ante estimate of future performance for planning purposes and not retrospectively.

PA and State	Enrollment Ratio	Asymmetric Ratio	Retrospective Realization Rate	Prospective Realization Rate
	(Reported Asymmetric / Enrolled Capacity)	**(Evaluated Asymmetric / Reported Asymmetric)**	**(Evaluated Symmetric / Reported Asymmetric)**	**(Evaluated Forecast / Reported Asymmetric)**
National Grid MA	77%	97%	82%	80%

Integrated Process and Impact Evaluation Findings:

- Challenges to Reliability: The ADR initiative and prior demand demonstrations provide substantial evidence that it is reasonable to expect PA load reduction targets to be met. Despite variability in load reduction across states and events, the CSPs and PAs have successfully recruited and managed resources, identified the annual system peak hour, and met overarching PA load reduction targets. However, the variability in load reduction across the limited number of event days and hours reduces confidence in the reliability of DR resources in the future. A better understanding of the dimensions of variability inherent in any DR program mitigates these concerns and suggests opportunities for continued reliability improvements.
- Shutdown Days: Customers are failing to report shutdown days to the PAs even though the initiative rules include a shutdown day allowance. The intent of this rule was to ensure that customer performance would not be negatively impacted if they had scheduled shutdowns. The shutdown day rule could save customers from a lower than expected event performance if events were called on a shutdown day. Also, shutdown days could have an impact on customer payments if they fell within their baseline period and went unreported.

- Pre-Cooling, Gaming, and Snapback: The impact evaluation investigated whether there was evidence of pre-event load increases that could be explained either by pre-cooling, load shifting, or gaming.3 Pre-cooling and load shifting are acceptable strategies for participation in the ADR initiative; however, acceptable load shifting strategies can be difficult to distinguish from gaming. Post-event, the impact evaluation investigated whether there was evidence of post-event load increases that could be explained by snapback. None of the load shapes point toward pre-event activity or snapback. The process evaluation investigated whether there was evidence of gaming through the customer surveys, where customers were asked if building operational adjustments were made in the hours leading up to an event. A quarter of respondents said yes but described taking action to reduce load prior to events (e.g., begin shutdown of slow-ramping equipment) to ensure that they could curtail adequately during events. These findings are described in more detail with illustrations in the body of this report (Evidence of Pre-Cooling, Gaming, and Snapback).

Summary of PA ADR Initiatives and ISO-NE Overlap Findings;

- Scenarios in which PA ADR initiative events and ISO-NE scarcity conditions overlap or are called coincidently are rare, as scarcity conditions occur because of a supply constraint (at the transmission level) while PA ADR events are called in response to mitigate load during the system peak hour.
- ISO-NE staff concerns regarding PA ADR initiative overlap are:
    - Participation in PA ADR events could result in eroding the ISO-NE baseline calculation and same-day adjustment for performance, or vice versa.
    - The ISO could over designate reserves of demand response resources (DRRs) that participate in PA ADR initiatives if their FCM bids are not revised.
- Although the ADR initiative rules specify how co-participation in the PA initiative and ISO-NE FCM should work, the PA initiative rules do not address the ISO's overlap concerns.
- Both ISO and PA staff expressed a willingness to discuss overlap concerns and solutions.

Programs to which the Results of the Study Apply: C&I ConnectedSolutions

Evaluation Recommendations included in the study:
Recommendation 1: Continue to seek solutions to accelerate the incentive payment process. National Grid is starting to allow CSPs to access their online day-after data and daily performance summaries. This access should help CSPs more quickly identify faulty meters or reconcile data discrepancies, which affect the payment turnaround time.

Recommendation 2: Remind and educate the CSPs of the shutdown allowance and reporting rule. The PAs could ask for pre-planned shutdown information during the application/enrollment process.

Recommendation 3: Adapt the shutdown rule to account for unexpected facility shutdown events. To exclude a facility shutdown day from a customer's baseline calculation, that customer or their CSP must notify their PA at least seven days in advance of the shutdown. It is difficult to do this when a facility shutdown event is unexpected. Consider allowing customers or CSPs to report the shutdown to the PA 24 hours before an event is called.

Recommendation 4 : Formally standardize all rules related to data quality, baseline calculation methods, and aggregation.

Recommendation 5: Establish data quality rules with clear outcomes for poor quality and/or insufficient data. The evaluation team developed several rules as part of this study, which are described in the Data Sufficiency section of this report; these rules may be a useful starting point to develop consistent rules. The data issues encountered in this study were not anticipated. Establishing firmer expectations or providing incentives are two possible means of motivating and ensuring clean and complete data in future initiative cycles.

Recommendation 6 : Use the retrospective realization rate to determine past season performance.

Recommendation 7: Use the prospective realization rate to estimate future load reduction.

Recommendation 8: In the short-term, representatives from ISO-NE, the PAs, and, if feasible, the CSPs should come together at a Demand Resources Working Group (DRWG) meeting and brainstorm mutually beneficial design solutions that would minimize the impact of one entity on the other.

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
Recommendation 1 – Yes National Grid continues to explore ways to make the incentive payment process faster.

Recommendation 2 – This recommendation is still under consideration.

Recommendation 3 – This recommendation is still under consideration.

Recommendation 4 – This recommendation is still under consideration.

Recommendation 5 – This recommendation is still under consideration.

Recommendation 6 – No National Grid is not applying the 82% retrospective realization rate in RI. The reason for this is RI applies results prospectively and due to this the prospective realization rate highlighted in Recommendation 7 is being applied to the RI 2021 plan.

Recommendation 7 – Yes National Grid is applying the 80% prospective RR result to the 2021 annual plan and any future plans until a new EM&V study is completed.

Recommendation 8 – This recommendation is still under consideration.

Rhode Island 2019 Energy Efficiency Workforce Analysis Final Report

Type of Study: Economic Impact
Evaluation Conducted by: Guidehouse
Date Evaluation Conducted: 2020

Evaluation Objective and High Level Findings:
National Grid engaged Guidehouse to estimate the workforce associated with implementation of National Grid Rhode Island's electric and gas energy efficiency programs delivered in 2019. This study addresses the requirements of General Law 39-2-1.2, enacted by the Rhode Island General Assembly in 2012. In 2019, National Grid spent a combined $134,751,5788 on the Rhode Island programs that saved 190,159 annual megawatt hours (MWh) of electricity9 and 451,466 million British thermal units (MMBtu) of natural gas.10

The focus of the study was to quantify the workforce that was involved in delivering National Grid's Rhode Island programs in 2019. The workforce analysis reported the number of jobs associated with the programs and compares them to past years. Guidehouse calculated 877.6 full-time equivalent (FTE) workers associated with National Grid spending in 2019 for Rhode Island programs.11 Since an FTE employee often represents the combined labors of more than one person over the course of a year, the number of individual workers is far greater than the number of FTEs. At a high level, spending for energy efficiency programs in Rhode Island increased from 2018 to 2019, leading to increased activity and therefore an increase in effort by the associated workforce. An overview of the findings of this report are shown below.

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[8] The Narragansett Electric Company d/b/a National Grid, 2019 Energy Efficiency Year End Report.
[9] Note that although the savings are not quantified here, the electric portfolio also includes delivery of energy efficiency services to customers that heat with delivered fuels.
[10] The Narragansett Electric Company d/b/a National Grid, 2019 Energy Efficiency Year End Report.
[11] As indicated in Appendix C, most vendors are either headquartered or have a physical presence in Rhode Island. The number of FTEs reported do not include customer employees who assist in various ways with project implementation in their facilities.

Summary of FTEs (2015-2019)

	2019	2018	2017	2016	2015
Electric Programs					
Residential Non-Income Eligible	189.1	170.9	98.1	104.0	125.4
Residential Income Eligible	65.1	45.8	46.0	42.3	37.0
Commercial and Industrial	265.0	250.0	263.5	241.1	210.0
Gas Programs					
Residential Non-Income Eligible	218.1	191.6	174.9	159.3	172.1
Residential Income Eligible	56.2	39.4	36.5	41.4	43.8
Commercial and Industrial	28.7	31.9	34.4	36.1	32.0
Other					
CAP Agencies12		35.0	35.0	38.0	34.0
National Grid13	43.3	39.5	38.2	39.9	41.6
Marketing14	12.1				
Total	877.6	804.1	726.5	702.2	695.8

Source: Guidehouse analysis and 2018 study

Key Findings:

- 877.6 full-time equivalent workers were associated with 2018 Rhode Island programs.
- Aggregate number of FTEs increased for the fifth consecutive year.
- One "full-time equivalent" worker often represents the combined labors of multiple persons.
- 1,151 individual companies and agencies were associated with delivering the programs.
- 71% of these entities are either headquartered or have a physical presence in Rhode Island.

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

Evaluation Recommendations included in the study:
N/A

[12] Note that for the 2019 analysis, CAP Agency staff were included within the Residential Income Eligible program under both Electric and Gas.
[13] In years prior to 2019 a 2,016-hour work year was assumed when calculating FTEs. National Grid changed this assumption in recent years to a 1,768-hour work year. This new assumption was implemented beginning in 2019 and resulted in a slight increase in FTEs. Under the new assumption, the 2018 National Grid FTE count would have been 45.
[14] Beginning in 2019, marketing was contracted to a new vendor, resulting in an increase in jobs, these are therefore shown separately.

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

Savings Impact:
N/A

MA-19R17-B-TRM Comprehensive TRM Review (Draft)

Type of Study: Impact
Evaluation Conducted by: Guidehouse
Date Evaluation Conducted: July 2020 (Draft findings)

Evaluation Objective and High Level Findings:
This study reviewed the quality of assumptions and values in the Massachusetts Technical Reference Manual (TRM) to ensure that relevant data from the RES 1 Baseline Study and other recent studies are incorporated into the TRM. The study prioritized TRM parameters that were based on older data sources, data sources outside MA or New England, or those that contribute significantly in EE programs. The below table summarizes the measures and recommended TRM updates that RI adopted based on the draft results of this study.

Summary of Recommended TRM Parameter Value Updates (Leveraged in RI)

Measure Name	Parameter Name	Parameter Unit	Existing Value	Proposed Value
Clothes Dryer (RES-A-CD)	EUL, Electric	Years	12	16
	EUL, Gas	Years	12	17
Dehumidifier (RES-PL-DH)	Capacity	Pints/Day	35	*Remove*
	Efficiency	Liters/kWh	Retirement: 1.0 Baseline: 1.5 Measure: 2.0	Retirement: 1.6 Baseline: 2.8 Measure: 3.3
	Hours of Operation	Hours/Year	Undocumented	*Remove*
	Dehumidification Load	Liters/Year	n/a	1,520
	Energy Savings	kWh/Year	New: 167.6 Retirement: 152.7	New: 82.3 Retirement: 407.1
	Demand Savings	kW	New: 0.04 Retirement: 0.04	New: 0.02 Retirement: 0.10
	EUL	Years	12	17
Low-Flow Showerhead (RES-WH-S)	EUL	Years	7	15
Low-Flow Showerhead with	Electric (Single Family)	kWh	372	247
	Electric (Single Family)	kW	0.08	0.06

Thermostatic Valve (RES-WH-STV)	Gas (Single Family)	MMBtu	1.84	1.22
	Oil (Single Family)	MMBtu	2.09	1.32
	Other (Single Family)	MMBtu	1.84	1.22
	Electric (Multi-family)	kWh	335	183
	Electric (Multi-family)	kW	0.09	0.04
	Gas (Multi-family)	MMBtu	1.66	1.41
	Oil (Multi-family)	MMBtu	1.88	1.44
	Other (Multi-family)	MMBtu	1.66	1.41
Pool Pump (RES-MAD-PP)	Operating Days per Year	Days/Year	91	122
	Pool Size	Gallons	20,000 to 23,000	22,000
	Flow Rates	gpm	Baseline: 64 2S: 66 high, 33 low VS: 50 high	Baseline: 71 2S: 71 high, 36 low VS: 57 high, 23 low
	Daily Operating Hours	Hours/day	Baseline: 8.5 2S: 2 high, 12.5 low VS: 2 high, 18 low	Baseline: 7.7 2S: 2 high, 13 low VS: 2 high, 22 low
	Energy Factor	EF	Baseline: 2.1 2S: 2.0 high, 5.2 low VS: 4.0 high, 8.8 low	Baseline: 2.0 2S: 2.0 high, 5.3 low VS: 2.9 high, 10.5 low
	Energy Savings	kWh/year	2S: 842, VS: 1,062	2S: 835, VS: 1,360
	Demand Savings	kW	2S: 0.87, VS: 1.12	2S: 0.87, VS: 1.43
	EUL	Years	10	6
Programmable Thermostat (RES-HVAC-PT)	EUL	Years	15	19
Room Air Cleaner (RES-PL-RAC)	Energy Savings	kWh	391	Varies

Room Air Conditioner (RES-PL-ROOMAC)	EUL	Years	8	12
ECM Circulator Pump (RES-HVAC-ECMCP)	CFWP	-	0.16	0.53
Heat Recovery Ventilator (RES-HVAC-HRV)	HRV Gas Savings	MMBtu	7.7	8.6
	HRV Electricity Savings	kWh	-133	-171
	HRV Demand Savings	kW	-0.10	-0.02
	ERV Gas Savings	MMBtu	-	8.8
	ERV Electricity Savings	kWh	-	-127
	ERV Demand Savings	kW	-	-0.014

Source: MA Comprehensive TRM Review (July 29, 2020 Draft Results)

Programs to which the Results of the Study Apply:
Residential Energy Star Products Electric
Residential EnergyStar HVAC
Residential EnergyWise Electric and Gas – Single Family and Multifamily programs
Residential Income-Eligible Electric and Gas – Single Family and Multifamily programs
Residential New Construction Electric
C&I Multifamily Gas

Evaluation Recommendations included in the study:
The evaluation team recommends the PAs adopt updated TRM values

Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:
National Grid adopted the results of this study.

Savings Impact:
The savings impact depends on the measure. See table for more details.

5. Historical Evaluation Studies

Sector	Program	Study type	2013	2014	2015	2016	2017	2018	2019	2020	2021 Plan
Residential	EnergyWise SF	Impact									
	EnergyWise SF	Process						HEAT Loan			
	Income Eligible SF	Impact									
	Income Eligible SF	Process									
	EnergyWise MF	Impact									
	EnergyWise MF	Process									
	Income Eligible MF	Impact									
	Income Eligible MF	Process									
	Home Energy Reports	Impact									
	Home Energy Reports	Process									
	EnergyStar Lighting	Impact/Market									
	EnergyStar Products	Impact									
	HVAC	Impact									Demo
	HVAC	Process/Market									
	Connected Solutions	Impact									
Cross-cutting	Potential study	Market									
	Job Impact	Jobs									
	Avoided Cost	Benefits									
	REMI	Benefits									
	Participation	Market									
	Non-Participant	Market									
	RASS	Market									
	Gas Peak Demand	Impact									
	Piggybacking Study	Process									
	Heat Pumps Study	Market									
	ES Homes/Codes & Standards	Impact/Market									
	Legislated M&V Study	Market									
C&I Electric	Custom	Impact									
	HVAC	Impact									
	Industrial Process	Impact									
	CAIR	Impact									
	Refrigeration, Motors, Other	Impact									
	Custom Lighting	Impact									
	Street Lighting	Impact									
	CDA	Impact									
	CHP	Impact									
	Prescriptive Lighting	Impact									
	Upstream Lighting	Impact									
	Upstream Lighting	Process									
	Prescriptive HVAC	Impact				chillers					
	Prescriptive VSD	Impact									
	Prescriptive CAIR	Impact									
	Connected Solutions	Impact									
	All	NTG									
C&I Gas	Custom	Impact									
	Prescriptive	Impact			steam traps		steam traps	steam traps			
	All	NTG									
Small Business	Lighting	Impact			prescriptive						
	Non-Lighting Electric	Impact									
	All	NTG									

These studies are available through the EERMC[15], the PUC[16], and National Grid.

2020	
Study	**Impact Descriptions**
Cadeo, Impact and Process Evaluation of EnergyWise Single Family Program, September 2020.	This study updated gross savings, in-service rates and net-to-gross ratios for the EnergyWise Single Family program.
Cadeo, Impact and Process Evaluation of EnergyWise Multi Family Program, September 2020.	This study updated gross savings, realization rates, in-service rates and net-to-gross ratios for the EnergyWise Multi Family program.
Cadeo, Impact and Process Evaluation of Income Eligible Multi Family Program, September 2020.	This study updated gross savings, realization rates and in-service rates for the Income-Eligible Multi Family program.
Cadeo, Impact Evaluation of Home Energy Reports Program 2017-2019, September 2020.	This study updated realization rates for the Home Energy Reports program.
Guidehouse, Comprehensive TRM Review Interim findings in July 2020 (Leveraged study from MA)	This study reviewed and updated savings assumptions and effective useful lives of several residential measures in MA. Rhode Island adopted the results to update savings assumptions and measure lives of several measures in the residential programs.
NMR, Lighting Hours of Use Study, March 2020. (Leveraged study from MA)	This study reviewed and updated the HOU used to calculate the lighting savings measures in MA. Rhode Island adopted the results to update savings assumptions for the lighting measures in RI.
NMR, LED Delta Watts Update, March 2020. (Leveraged study from MA)	This MA study updated delta watts for lighting measures. Rhode Island adopted the results to update gross savings calculation for its Residential Lighting measures.

[15] https://rieermc.ri.gov/plans-reports/evaluation-studies/
[16] http://www.ripuc.org/

Guidehouse, Residential Wi-Fi Thermostat DR Evaluation, April 2020. (Leveraged study from MA)	This study reviewed and updated the savings being used In MA for the Wi-FI DLC program offering. Rhode Island adopted the results to update savings for Wi-Fi DLC offering in RI.
Guidehouse, 2019/2020 Residential Energy Storage Demonstration, Februray 2020. (Leveraged study from MA)	This study reviewed and verified the savings being used In MA were accurate for the Residential demand response battery storage offering. Rhode Island adopted the results for residential battery storage demand response offering in RI.
ERS, Evaluation of 2019-2020 Cross-State DR Program, Februrary 2020. (Leveraged study from MA)	This study reviewed and updated the summer demand realization rate being used In MA for the C&I targeted dispatch program offering. Rhode Island adopted the results for the C&I targeted dispatch demand response offering in RI.
DNV GL, Impact Evaluation of PY2017 Custom Gas Installations. May 2020.	The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY2016 and PY2017.
DNV GL, Impact Evaluation of PY2018 Custom Gas Installations. September 2020.	The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY2016, PY2017, and PY2018.
DNV GL, Impact Evaluation of PY2018 Custom Electric Installations. Interim Findings August 2020.	The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from RI PY2016, MA PY2017-18, and RI PY2018.
DNV GL, Impact Evaluation of 2017 Small Business Electric Installations. March 2020.	The study updated electric non-lighting impact factors for the Small Business initiative. RI leveraged the MA study of this initiative.
DNV GL, C&I Measure Life Study. March 2020.	This study informed Effective Useful Lives and Remaining Useful Lives for key C&I energy efficiency measures, updating the commercial boiler EUL. RI leveraged the MA study of this initiative.

Tetra Tech, C&I Free-Ridership and Spillover Study. Anticipated September 2020.	This study updated free-ridership and spillover rates for the C&I program
2019	
Study	**Impact Descriptions**
NMR, Residential Appliance Recycling Impact Factor Update. April 2019	This study updated gross savings, realization rate and net savings estimates for refrigerator and freezer recycling offered through ENERGY STAR Products program.
NMR, Delta Watts Update. April 2019. (Leveraged study from MA)	This MA study updated delta watts for general service lamps, specialty and reflectors. Rhode Island adopted the results to update gross savings calculation for its Residential Upstream Lighting program.
NMR, RLPNC 17-9 2019-21 Planning Assumptions: Lighting Hours-of-Use and In-Service Rate. July 2018. (Leveraged study from MA)	This study recommended planning values for hours of use and in-service rates for general service lamps, specialty and reflectors. Rhode Island adopted the results to update impacts for its Residential Upstream Lighting program.
NMR, RLPNC 17-3 Advanced Power Strip Metering Study (Revised). March 2019. (Leveraged study from MA)	This study yielded recommended gross electric savings and realization rates from advanced power strips offered through the Home Energy Services and upstream programs. Rhode Island adopted the result from this study to inform savings for Tier 1 and Tier 2 advanced power strips offered through its Retail Products program.
Navigant, Wifi Thermostat Impact Evaluation Secondary Research Study. September 2018. (Leveraged study from MA)	This study recommended annual savings values of 31 therms for combustion heating, 97 kWh for electric resistance heating, and 64 kWh for central air conditioning for Wifi thermostats. Rhode Island adopted these results to update savings assumptions for Wifi thermostats in HVAC and residential retrofit programs.
DNV GL, Impact Evaluation of PY2016 Custom Gas Installations. December 2019.	The study updated realization rates for custom gas projects, as part of a study leveraging the MA study of the same program element.

DNV GL, Impact Evaluation of PY2016 Custom Electric Installations. January 2020.	The study updated realization rates for custom electric projects, as part of a study leveraging the MA study of the same program element.
2018	
Study	**Impact Descriptions**
Energy & Resource Solutions, Two-Tier Steam Trap Savings Study. April 2018.	This MA study recommends a two-tier approach for prescriptive steam traps. It calculates deemed savings to be 8.4 MMBtu/yr for system operating pressure ≤15 psig, and 35.6 MMBtu/yr for system operating pressure is >15 psig.
DNV GL, Impact Evaluation of PY 2015 Rhode Island Commercial and Industrial Upstream Lighting Initiative. September 2018.	The study updated impact factors for the Upstream Lighting initiative. The RI study leveraged the MA study of the same initiative.
DNV GL, Rhode Island Commercial & Industrial Impact Evaluation of 2013-2015 Custom Comprehensive Design Approach. October 2018.	The study updated the realization rate for the CDA initiative. The RI study leveraged the MA study of the same initiative.
DNV GL, Impact Evaluation of PY2016 RI C&I Small Business Initiative: Phase I. June 2019.	The study updated impact factors for the Small Business initiative. The RI study leveraged the MA study of the same initiative.
DNV GL, Prescriptive C&I Loadshapes of Savings. March 2018.	This MA study pooled known sources of 8,760 savings loadshapes in an interactive tool to estimate general prescriptive measure loadshapes over customizable time periods.
DNV GL, P78 Upstream LED Net-to-gross Analysis. August 2018.	This MA study updated net-to-gross values for the C&I Upstream Lighting initiative for 2019, 2020, and 2021.
DNV GL, P86 Lighting Hours of Use Study. April 2019.	This MA study used lighting hours of use data from several previous studies to determine hours of use by building type for the C&I Upstream Lighting program.
DNV GL, P81 Process Evaluation of C&I Upstream Lighting Initiative. September 2018.	The MA study updated in-service rates for the C&I Upstream Lighting initiative.

Illume Advising LLC, Rhode Island Statewide Behavioral Evaluation: Savings Persistence Literature Review. January 2018.	This study reviewed the existing research on the persistence of savings generated by HERs with particular attention to the applicability of each study to Rhode Island. The study explored potential impacts on the HER program when reducing the cadence of reports.
Synapse Energy Economics, Avoided Energy Supply Components in New England 2018 Report. March 2018.	This study developed new estimates of avoided costs associated with energy efficiency measures for program administrators throughout New England States. Rhode Island used the avoided costs of energy, capacity, natural gas, fuel oil, environmental costs and demand reduction induced price effects resulting from this study for 2019 program planning.
Navigant, 2017 Seasonal Savings Evaluation. March 2018.	This study evaluated the Nest thermostat optimization program offered in Massachusetts and Rhode Island. The study found that the program achieved energy and demand savings of 57 MWh and 134 kW, respectively, in Rhode Island
Navigant, 2017 Residential Wifi Thermostat Demand Response. April 2018.	This study evaluated the controllable thermostats as a demand response technology offered through Massachusetts and Rhode Island ConnectedSolutions programs. The study found average demand savings of 0.44 kW per thermostat in Massachusetts and 0.52 kW per thermostat in Rhode Island.
NMR, Rhode Island Lighting Market Assessment. July 2017	This Residential study estimated lighting saturation and other critical market indicators in Rhode Island and included a detailed comparison to Massachusetts. The study concluded that the two markets are substantially similar, therefore Rhode Island can use the results from the recently completed net-to-gross consensus study in MA to inform program planning for the Residential Upstream Lighting program.

Research Into Action, Rhode Island HEAT Loan Assessment. December 2018	This study assessed the extent to which HEAT Loan encourages uptake of weatherization and HVAC projects through the EnergyWise program. Findings from this study will be used to inform program planning and support future potential studies in Rhode Island.
NMR, Rhode Island Residential Appliance Saturation Survey. October 2018	This study developed an inventory of residential end-uses, including appliances, consumer electronics, heating and cooling equipment, thermostats, water heating, and building characteristics. Findings from this study will be used to inform program planning and support future potential studies in Rhode Island.
Cadeo, Rhode Island Impact Evaluation of Income Eligible Services Single Family Program, August 2018	This study deemed savings values and realization rates for electric and gas participants using billing and engineering analysis. The Company adopted the deemed savings values in the 2019 program plan.
NMR, RLPNC 17-11 LED Net-to-Gross Consensus Panel Report. June 2018. (Leveraged study from MA)	This study yielded recommended prospective net-to-gross ratios for 2019 to 2021 for the Residential Upstream Lighting program in MA. Rhode Island adopted the NTG established for 2019 and 2020 due to similarity in lighting market condition.
NMR, RLPNC 18-5 Home Energy Assessment LED Net-to-Gross and EUL Consensus. July 2018 (leveraged study from MA)	The study yielded recommended net-to-gross and estimated useful life for direct installed LED bulbs offered through the Home Energy Services Initiative in Massachusetts. Rhode Island adopted the results from this study to inform 2019 and 2020 planning for the Residential EnergyWise program.
NMR, RLPNC 18-4 Products Net-to-Gross Consensus Study, August 2018. (Leveraged study from MA)	This study yielded prospective net-to-gross for Residential Retail products for 2019 to 2021 in Massachusetts. Rhode Island adopted the results from this study to inform 2019 and 2020 planning for the Residential Products program.

Navigant, MA Residential Electric Loadshape and Baseline Study (Heating and Cooling Season report). July 2018. (Leveraged study from MA)	This study collected saturation, penetration and usage behavior data for all major electric and gas appliances in Massachusetts. Rhode Island adopted the end use load shapes determined by this study.
NMR, RLPNC 17-4/17-5 Products Impact Evaluation of In-service and Short-term Retention Rates Study. March 2018. (Leveraged study from MA)	This study yielded estimates of in-service rates (ISRs) and short-term retention rates for products currently offered through the Residential Consumer Products Core Initiative or the Mass Save® Home Energy Assessment (HEA) Programs. Rhode Island adopted the result from this study to inform savings for measures offered through Residential Products program.
NMR/Tetra Tech, TXC34 Massachusetts Residential HVAC Net-to-Gross and Market Effects Study. July 2018. (Leveraged study from MA)	This study yielded recommended net-to-gross ratios for selected heating, cooling, and water heating measures that will receive Mass Save® Standard rebates in 2019-2021. Rhode Island adopted the result from this study to inform savings for measures offered through Residential HVAC/HEHE programs.
Tetra Tech, Market-Rate Multifamily NEI – Phase I Final Memo. March 2018.	This MA study reviewed non-energy impacts associated with market-rate multifamily properties, including whether or not any additional NEIs should be applied, whether NEI values differ based on type and ownership of building, and whether there is double counting of NEIs.
Tetra Tech, Non-Energy Impact Framework Study Report. January 2018.	This MA study reviewed the current status of NEIs and had the following recommendations: do not count existing property value NEIs, review the BCR-model-related differences highlighted in the study and determine whether there is a reason for each, and, in cases where an NEI for one initiative or measure is applied to a different initiative or measure, provide clear public documentation of how the decision was made.

DNV GL, NMR Group, Tetra Tech, Massachusetts Commercial and Industrial Upstream HVAC/Heat Pump and Hot Water NTG and Market Effects Indicator Study. September 2018.	This MA study updated NTG for the following upstream equipment: • Ductless mini-split heat pumps • Electric water-source heat pumps • Air-cooled unitary/split central air conditioning (>5 tons) • Gas-fired storage water heaters between 76,000 and 300,000 BTU/hour • Gas-fired tankless water heaters between 180,000 and 199,900 BTU/hour
DNV GL, Evaluation of 2017 Demand Response Demonstration: C&I ConnectedSolutions. February 2018.	This MA study reviewed the baseline application and impacts calculated by the AutoGrid system, examine the effectiveness of the Connected Solution baseline, and assess ex-post impacts. It was also designed to understand customer acceptance and experience with the intervention, readiness of systems for larger deployment, and PA and vendor success in delivery.
2017	
Study	**Impact Descriptions**
Navigant, Rhode Island Energy Efficiency Program Customer Participation Study – Phase 1, October 2017	The study characterized participants and non-participants in several energy efficiency programs and identified customers that can be potentially targeted to increase participation.
NMR, 2017 Rhode Island Single-Family Code Compliance/Baseline Study, July 2017	This study yielded the final agreed upon baseline values to update the User Defined Reference Home (UDRH) in Rhode Island
ICF, 2017 Rhode Island Residential Code Savings Analysis	This study found that the average Rhode Island home could attain annual electric savings of 3,690 kWh and gas savings of 10 MMBtu if it fully complied with the state's building energy code.

NBI, 2017 Rhode Island Commercial Code Savings Analysis	This study found that the average Rhode Island commercial building could attain annual electric savings of 0.73 kWh/sf and gas savings of 0.90 MMBtu/sf if it fully complied with the state's building energy code.
NMR, 2017 Rhode Island Code Compliance Enhancement Initiative Attribution and Savings Study	The study found residential and commercial attribution factors of 23% and 46, respectively, which were used along with study results on average savings as well as construction activity projections to calculate the CCEI's projected savings from 2018-2020.
Peregrine Energy Group, Analysis of Job Creation from 2016 Expenditures for Energy Efficiency in Rhode Island by National Grid, April 2017	A study of the job impacts of National Grid's energy efficiency programs delivered to Rhode Island electricity and natural gas customers in 2016. The study estimated that 702 FTE workers, across 923 companies and agencies were employed in 2016 as a result of investments energy efficiency programs in Rhode Island.
New Buildings Institute, Energy Impacts of Commercial Building Code Compliance in Rhode Island, July 2017	This study quantified the energy impacts of energy code compliance patterns from field data collection and analysis of building characteristics.
The Cadmus Group, Inc., Ductless Mini-Split Heat Pump Impact Evaluation, 2016	This study estimated savings from various types of heat pumps.
DNV-GL, Impact Evaluation of 2014 Custom HVAC Installations, September 2017	The study updated realization rates for custom electric HVAC projects, as part of a study leveraging the MA study of the same program element.
DNV-GL, 2014 RI Custom Process Impact Evaluation, December 2017	The study updated realization rates for custom process projects, as part of a study leveraging the MA study of the same program element.
TetraTech, C&I Programs Freeridership & Spillover Study, September 2017	This study updated free-ridership and spillover values for the C&I electric and gas programs.
DNV-GL, MA C&I Steam Trap Evaluation Phase 2, Feb, 2017	This study updated steam trap savings estimates.
DNV-GL, Gas Boiler Market Characterization Study Phase II: Final Report, March 2017	This study updated C&I condensing boiler savings estimates.

DNV-GL, MA45 Prescriptive Programmable Thermostats, March 2017	This study updated programmable thermostat deemed gas savings for C&I programs.
2016	
Study	**Impact Descriptions**
DNV-GL, Impact Evaluation of 2014 Custom Gas Installations in Rhode Island Final Report, July 2016	This study 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 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 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 has been 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.
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.

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 the 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.
DNV GL, Stage 2 Results—Commercial and Industrial New Construction Non-Energy Impacts Study—Final Report, prepared for the Massachusetts Program Administrators, March 2016	The purpose of this study was to quantify the dollar value of participant NEIs for C&I NC projects completed in 2013, and to estimate gross NEIs per unit of energy savings resulting from NC electric and gas measures separately.
2015	
Study	**Impact Descriptions**
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 and 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.
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.
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.
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.
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., 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.

2012	
Study	**Impact Descriptions**
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**
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

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

Attachment 4

2021 Rhode Island Test Description

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1 Introduction

This section has been prepared pursuant to Section 1.3(C) and 3.2(N) of the Least Cost Procurement Standards as approved and adopted pursuant to Order No. 23890 in Docket No. 5015[1] (referred to herein as the "LCP Standards"), and in alignment with the Rhode Island Benefit Cost Test (RI Test) as defined by the Standards and the Docket 4600A Benefit-Cost Framework and associated Guidance. The methods identified herein for the calculation of benefits and costs associated with the 2021 Annual Energy Efficiency Plan are also applied to the screening of the initial goals in the 2021 – 2023 Three Year Plan.

Two key supporting documents for cost effectiveness are the Technical Reference Manual (TRM) and the Avoided Cost Study. For the Annual Plan, the Company developed the 2021 Rhode Island Technical Reference Manual, which documents the savings or savings algorithms and costs for measures proposed to be offered through its programs in 2021. The TRM identifies the sources for the savings estimates. Sources can be evaluation studies, engineering analyses, and/or other research or analysis. 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. 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 developed by Synapse Energy Economics as part of the "Avoided Energy Supply Components in New England: 2018 Report" (2018 AESC Study) sponsored by the New England electric and gas efficiency program administrators to be used for cost effectiveness screening in 2019 through 2021. 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 forward capacity market. Company-specific transmission and distribution capacity values are also included. There were several noted changes to the avoided costs in the 2018 AESC Study compared to the 2015 iteration of the AESC study.

The 2018 AESC Study found lower avoided costs of energy due to sustained low natural gas prices at national hubs and lower estimated costs of complying with the Regional Greenhouse Gas Initiative (RGGI). Avoided capacity costs were also lower due to changes in market rules and a lower estimate for the cost of new entry. Avoided costs of natural gas were lower based on shale gas breakeven prices. Avoided costs for fuel oil and other fuels increased. There was also an increase in the values for electric capacity demand reduction induced price effects (DRIPE) and oil DRIPE, where these were estimated to be non-existent or were not calculated in AESC 2015 Study. The 2018 AESC Study also quantified new

[1] RI PUC Docket 5015, Least Cost Procurement Standards
http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf

benefits for non-embedded NO_x reduction benefits, the value of improved reliability, and avoided pool transmission facilities costs. Due to all these factors, the avoided costs benefits have increased in 2021 compared to years before the 2018 AESC Study.

Looking forward to the 2022 Annual Energy Efficiency Plan, National Grid anticipates that an updated set of avoided costs from the regional avoided cost study (AESC 2021) will be applied to the benefit cost screening of the programs in the RI Test. AESC 2021 is ongoing at the time of this plan and is anticipated to be completed by early 2021. Additional benefits and costs categories may be assessed and quantified in future Annual Plans and the component values may be updated over the course of the three year period based on the availability of new study results. Future updates to inputs and values will be included in future Annual Plan filings.

2 The RI Test Overview and Docket 4600 Benefit Cost Framework

The RI 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 RI Test may be applied to any energy efficiency program independent of the primary fuel or resource the effort focuses on.

The RI 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 RI 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 RI 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 RI 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 RI Test. The costs incurred by customers to acquire equipment on their own are also counted as costs in the RI 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 the RI Test as applied to Energy Efficiency and Active Demand Response are detailed in the next section.

3 Description of Program Benefits and Costs

The following benefits and costs are included as quantified and monetized in the RI Test. They are listed here with details after. Section 5 of this document shows the alignment of each of these benefit and cost categories to the Docket 4600 Benefit-Cost Matrix for the electric portfolio.

- Electric Energy Benefits
- Electric Generation Capacity Benefits
- Electric Transmission Capacity and Distribution Capacity Benefits
- Natural Gas Benefits
- Fuel Benefits (including the value of delivered fuel savings from programs that influence delivered fuel consumption)
- Water and Sewer Benefits
- Non-Energy impacts
- Price Effects
- Non-embedded Greenhouse Gas Reduction Benefits
- Economic Development Benefits
- Non-embedded NOx Reduction Benefits
- Value of Improved Reliability
- Combined Heat and Power Benefits
- Utility Costs

[2] Both free-ridership and spillover have been determined from evaluation, measurement, and verification studies of program participants, non-participants, and other market actors.

- Participant Costs

3.1 Electric Energy Benefits

Avoided electric energy costs are appropriate benefits for inclusion in the RI 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 2018 AESC Study, Appendix B. The values in the AESC Study represent wholesale electric energy commodity costs that are avoided when generators produce less electricity because of energy efficiency.[3] 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 2018 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 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.

[3] 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.

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.[4] 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 + $\%Losses_{WinterOffPk\text{-}kWh}$)

3.2 Electric Generation Capacity Benefits

Avoided electric generation capacity values are appropriate for inclusion in the RI 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 2018 AESC, Appendix B. 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, 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,

[4] 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 2020 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.

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 + $\%Losses_{SummerkW}$)

In addition to the traditional valuation of electric generation capacity, for which results are provided in Appendix B, the 2018 AESC study developed a new approach to valuing the capacity of short duration measures that are not actively bid in the ISO-New England Forward Capacity Market (FCM). The AESC study has always provided avoided electric generation capacity values that are differentiated based on whether a measure is bid in the FCM (cleared capacity) or is not bid in the FCM and passively reduces system load and, as a result, reduces the ISO-NE load forecast and the resulting amount of capacity that is procured through the FCM (uncleared capacity), with the overall avoided capacity value representing a weighted average of the cleared capacity and uncleared capacity values. Given the three year forward nature of the FCM and the timing of the ISO-NE load forecast, it takes five years from the time of load reduction for uncleared capacity to begin impacting the FCM procurements. As a result, measures with a useful life less than five years (ex. demand response) would not produce any generation capacity benefits in years 1-5 under the traditional capacity modeling methodology.

The 2018 AESC study conducted a detailed analysis of the ISO-NE load forecast methodology and determined that there are deferred capacity benefits for short duration measures that are not bid in the FCM which persist beyond the useful measure life of the measure. The logic behind this analysis is that the ISO-NE load forecast utilizes multiple years of historical load data and that even a load reduction for only one year will have a lasting impact on the load forecast for a number of years. The deferred capacity valuation methodology for uncleared capacity is used to determine the avoided electric generation capacity value for demand response measures based on the values provided in Appendix J of the 2018 AESC study.

3.3 Electric Transmission Capacity and Distribution Capacity Benefits

Avoided transmission and distribution capacity values are appropriate for inclusion in the RI 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 distribution capacity benefits are valued in the RI Test using avoided distribution capacity values calculated in a spreadsheet tool that was developed in 2005 by ICF International, Inc., updated with recommendations from the 2018 AESC Study. The tool calculates an annualized value of statewide avoided 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.

Electric transmission capacity benefits are valued in the RI Test based on the costs of Pool Transmission Facilities (PTF). The 2018 AESC study calculates an avoided cost for PTF of $94/kW-year in 2018 dollars. Based on recommendations from the 2018 AESC Study, the Company is using the PTF costs instead of local transmission investments.

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 ($) = $(kW_{Summer} * Dist\$/kW_{(@Life)} * [1 + (Losses_{SumkWDist})]$

3.4 Natural Gas Benefits

Avoided natural gas consumption is appropriate for inclusion in the RI Test. When a project in which consumers have invested saves natural gas, an avoided resource benefit is created.

Natural gas benefits in the RI Test are valued using avoided natural gas values from the 2018 AESC Study, Appendix C. These costs include commodity, transportation, and retail delivery charges that would be avoided by fuels not consumed by end users.

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)}$)

3.5 Delivered Fuel Benefits

Avoided delivered fuel costs (natural gas, propane, or fuel oil) are appropriate for inclusion in the RI Test. When a project in which consumers have invested saves fuel an avoided resource benefit is created.

Fuel benefits in the RI Test are valued using avoided fuel values from the 2018 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$_{(EndUseCategory,@Life)}$

3.6 Water and Sewer Benefits

Water savings created from program efforts should be valued and included in the RI 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 April 2020 internet survey of rates posted to the Rhode Island PUC website, updated as of October 25, 2018. Average rates were calculated for both residential and commercial and industrial customers and applied as appropriate to the water savings generated by measures.[5]

Water and sewer benefits are counted for all projects, where appropriate, and calculated as follows:

[5] RI Regulated Water Suppliers – Rates Updated October 25, 2018, http://www.ripuc.ri.gov/utilityinfo/water/residentialgri.html

- Water and Sewerage Benefits ($) = Water and/or Sewerage Savings * Water and/or Sewer $/Gal$_{(@Life)}$

3.7 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 RI Test. Non-energy impacts are typically associated with the number of measures installed, rather than the energy consumption of the equipment, however in some cases they are applied on an annual or one-time basis based on energy saved. 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 2021 Annual Plan for prescriptive measures are documented in the 2021 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 income-eligible 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$_{(@Life)}$

3.8 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 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 RI 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 and kW 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 2021 from the 2018 AESC Study are used in the RI Test. The price effects are expressed as $/kWh for each of the four energy costing periods, $/kW for capacity, $/MMBtu for natural gas, and $/MMBtu for oil. There are also cross fuel effects that apply when natural gas energy efficiency affects the price of electricity due to the fact that residential heating and electric generation compete for natural gas supply in the winter. The resulting 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.) In addition, reducing demand for petroleum and refined products leads to a reduction in oil prices. 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$/MMBtu)
- Oil DRIPE Benefit ($) = MMBTU Fuel Savings * ($OilDRIPEValue\$/MMBTU_{(@Life)}$)

3.9 Non-embedded Greenhouse Gas Reduction Benefits

In accordance with Section 1.3(C)(iii) of the LCP Standards, the RI Test includes the value of non-embedded greenhouse gas (GHG) reductions.

The 2018 AESC Study developed two approaches for calculating non-embedded cost of carbon. The first approach is based on global marginal abatement costs that yield a value of $100 per short ton of CO_2 emissions and is identical to the prior 2015 AESC Study value used in the 2018 and 2019 Plans. The second

approach is based on New England specific marginal abatement costs, where it is assumed that the marginal abatement technology is offshore wind. On October 24, 2018 an amendment to the 2018 AESC Study was issued that corrected assumptions related to the calculation of offshore wind costs. Based on this corrected projection of the future costs of offshore wind energy, the 2018 AESC Study amendment establishes a New England specific cost of $68 per short ton.

The Company proposes to apply the updated value of $68 per short ton in the RI Test as the estimate of the societal cost of carbon emissions, and as the long-term value of the cost to achieve the Resilient Rhode Island Act carbon emission reduction goal of 80% below 1990 levels by 2050. The Company is moving from the global to New England specific value as it represents a conservative and reasonable non-embedded carbon price that reflects the likely marginal abatement technology for Rhode Island in achieving its carbon reduction goals.

The costs of compliance with the Regional Greenhouse Gas Initiative (RGGI) are already included or "embedded" in the projected electric energy market prices. Therefore, the difference between the $68 per short ton societal cost and the RGGI compliance costs already embedded in the projected energy market prices represents the value of carbon emissions not included in the avoided energy costs.

An example of this calculation for the year 2021 is shown below. The resulting $56.86 non-embedded avoided cost is applied as a benefit in the RI Test in that year.

- Societal Cost ($68) – Embedded RGGI Compliance Cost ($11.14) = Non-Embedded Cost ($56.86)

The Company obtained the non-embedded CO_2 values from the following tables in the 2018 AESC Study for use in the RI Test cost-effectiveness screening: Table 154 for electric savings and Table 156 for gas savings and oil savings.

3.10 Economic Development Benefits (Non-CHP Measures)

In accordance with the Docket 4600 Framework, the RI Test includes the application of multipliers for economic development impacts to all energy efficiency measures. This section details the methodology for applying economic benefits to non-CHP measures. Section number 13 in this document refers to the application of economic benefits to CHP measures.

The macroeconomic multipliers for the economic growth and job creation benefits of investing in cost-effective energy efficiency are derived from a recent study "Review of RI Test and Proposed Methodology" prepared for National Grid by the Brattle Group, January 31, 2019. The revised multipliers resulting from this study and methodology were first incorporated in the screening of the 2020 portfolio of programs.

The Brattle Group study recommend the following key changes to the previous methodology used in "Macroeconomic Impacts of Rhode Island Energy Efficiency Investments, REMI Analysis of National Grid's Energy Efficiency Programs," National Grid Customer Department, November 2014, which developed the prior economic impact benefit multipliers for use in the RI Test:

1. The allocation of spending, benefits, and costs to sectors in REMI based on the breakdowns found in each program spending budget and projected benefits instead of the use of total overall Energy Efficiency Plan values. This provides for a program specific economic impact that more accurately reflects how the implementation of each program impacts the RI economy.
2. Changing the allocation of energy efficiency program spending to sectors in the REMI model from using a generic study to using actual electric and gas program budget data that more accurately reflects where money gets spent in the economy.
3. The exclusion of rebates and incentives for Residential Lighting, Home Energy Reports, HVAC, Residential Products, Residential New Construction (RNC) and Large Commercial New Construction from the REMI analysis.
4. Accounting for the negative impacts that reduced energy consumption has on transmission, distribution, and generation spending in Rhode Island.
5. Avoiding double counting of ratepayer benefits and costs in the RI Test by only counting their indirect and induced economic impacts.

These changes provide for a more accurate accounting of the net-incremental benefits of Rhode Island's energy efficiency programs beyond what is already claimed in the RI Test. The revised run of the REMI regional economic model of Rhode Island to estimate these economic impacts yielded the following program-specific multipliers for use in the RI Test.

Program Type	GDP/$ Program Spending
Electric Program	
Residential	
Residential New Construction (RNC)	$1.40
HVAC	$1.42
EnergyWise	$0.93
EnergyWise Multifamily	$1.34
Residential Lighting	$1.59
Residential Products	$1.52
Home Energy Reports	$1.00
Single Family - Income Eligible Services	$0.86
Income Eligible Multifamily	$1.19
Commercial and Industrial	
Large Commercial New Construction	$3.11
Large Commercial Retrofit	$5.80
Small Business Direct Install	$1.97
Total Electric Portfolio	**$2.14**
Gas Program	
Residential	
ENERGY STAR® HVAC	$0.83
EnergyWise	$1.01
EnergyWise Multifamily	$1.63
Home Energy Reports	$1.06
Residential New Construction	$0.22
Single Family - Income Eligible Services	$0.99
Income Eligible Multifamily	$1.55
Commercial and Industrial	
Large Commercial New Construction	$1.42
Large Commercial Retrofit	$2.53
Small Business Direct Install	$1.75
Commercial & Industrial Multifamily	$1.89
Total Gas Portfolio	**$1.26**

Demand Response	
Residential Connected Solutions	$0.83
Commercial Connected Solutions	$2.19
Total Demand Response Portfolio	**$2.02**

The Company applied the updated multipliers at the program level as part of the RI Test.

3.11 Non-embedded NOx Reduction Benefits

In accordance with Section 1.3(C)(iii) of the Standards and the Docket 4600 Benefit-Cost Framework, the RI Test includes the value of nitrogen oxides (NO_x) emission reductions not already embedded in the avoided cost of energy.

NO_x emissions come from a variety of sources including industrial processes and the combustion of natural gas for electric generation and heating systems. NO_x contributes to the formation of fine particles (PM) and ground level ozone that are associated with adverse health effects including respiratory illness. When a consumer installs an energy efficiency measure that reduces electric generation and natural gas usage, and thus NO_x emissions, an avoided resource benefit is created.

The 2018 AESC Study utilizes published averages for the continental United States to develop a non-location specific, non-embedded NO_X emission cost of $31,000 per ton of nitrogen, which translates into an avoided wholesale cost for NO_X of $1.65 per MWh.

The Company obtained the non-embedded NO_X values from the following tables in the 2018 AESC Study: Table 157 for electricity and Table 158 for non-electric fuels.

3.12 Value of Improved Reliability

In accordance with the Docket 4600 Benefit-Cost Framework, the RI Test includes the value of improved reliability from energy efficiency investments.

The 2018 AESC Study used the following methodology to determine the value of improved reliability. The study used the value of lost load (VoLL) from the Lawrence Berkeley National Laboratories (LBNL) assessment "Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States." Berkeley: LBNL, 2015. LBNL-6941E. The VoLL describes the cost to consumers of being unable to take power from the system. The AESC 2018 Study then applied customer segment ratios typical to New England to adjust the LBNL findings to be suitable for the region. The resulting value is $37/kWh. The study also computed an estimate of the value of reliability as the ratio of annual state Gross Domestic Product (GDP) to annual energy consumption which results in a lower bound of $12/kWh.

The 2018 AESC Study then examined the effect of load reduction's ability to increase reserve margins in the ISO New England (ISO-NE) Forward Capacity Market (FCM) and therefore increase reliability in the wholesale generation market.

Load reductions can improve generation reserves in the following ways:

1. To the extent that energy efficiency reduces the capacity clearing price in ISO-NE FCM auctions, the amount of capacity acquired will increase, leading to higher reserve margins and therefore increased reliability.
2. Lower capacity market prices will result in some additional supply resources not clearing in the FCM auction. Some of those resources will continue to operate and provide generation when supply is tight and prices are high.
3. The ISO-NE Competitive Auctions with Sponsored Policy Resources (CASPR) program will result in some resources supported by state mandates being excluded from participating in the FCM auctions. With lower load, these non-cleared capacity resources will create a contribution to reserves and reliability.
4. Some energy efficiency measures that reduce load do so without impacting the amount of cleared capacity in the FCM such as measures in behavior based programs and demand response programs not bid into the market. These load reductions will increase the reserve marking and therefore improve reliability.

The ISO-NE marginal reliability index (MRI) estimates values from the above impacts of load reduction. The MRI is the change in loss of energy expectation (LOEE) in MWh, for each additional MW of available capacity or reserve margin. The 2018 AESC Study calculated the final values per kW-month for increased reserve capacity, by multiplying the two estimates of the VoLL by the FCM Auction 12 MRIs at various clearing prices, with the corresponding reserve margins.

As recommended by the AESC 2018 Study, the Company applies different reliability values to measures that clear and don't clear the Forward Capacity Market auction. This is due to the fact that the reliability effect of cleared energy efficiency load reductions will be partially offset by reduction in the amount of other capacity cleared, while uncleared load reductions will not be subject to such offsets.

The Company applied Reliability Value of Cleared EE ($/kW-year) from AESC 2018 Study to all summer kW savings associated with cleared measures and the Reliability Value of Uncleared EE ($/kW-year) from Table 99 to all summer kW savings associated with uncleared measures.

The reliability benefit is calculated as follows with the ReliabilityValue$/kW changing whether a measure is assumed to be cleared or uncleared in the FCM auction. The 2018 AESC Study finds that the 15-year

levelized benefit of increasing generation reserves through reduced energy usage is $0.65/kW-year for cleared resources and $6.60/kW-year for uncleared load reductions.

- Wholesale Reliability Value Benefit ($) = kWSummer * ReliabilityValue$/kW(@Life) * (1 + %LossesSummerkW)

3.13 Combined Heat and Power Benefits 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). 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.[6] 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 $2.13 of lifetime gross state product increase per dollar of program investment for CHP projects less than 3 MW in size, based on the report, "Review of RI Test and Proposed Methodology" prepared for National Grid by the Brattle Group, January 31, 2019. The $2.13 multiplier reflects the present value of lifetime state gross domestic product (GDP) effects of program and participant spending that creates jobs in construction and other industries as the project is planned, and equipment is purchased and installed. Therefore, the CHP Economic Development benefits will be calculated as:

- Program and participant spending($) x $2.13

For CHP projects larger than 3 MW in size, the Company will run a REMI analysis using project-specific values in accordance with the recommended methodology from the Brattle Group study.[7]

[6] See R.I. Gen.Laws § 39-1-27.7(c) (6) (iii).

[7] In the 2021 Benefit Cost Model, the Company applied a weighted average economic multiplier to the C&I Retrofit program that accounts for the economic multipliers for C&I Retrofit and CHP. CHP expenditures, besides incentives, are not disaggregated from the rest of the expenditures for the C&I Retrofit program so the multiplier cannot be applied directly to program spending for CHPs. Therefore, the Company created a multiplier applicable to both CHP and C&I Retrofit by taking a weighted average of the two multipliers, weighted by incentives to be spent on CHP and the rest of C&I Retrofit projects. The final weighted average multiplier applied to the total C&I Retrofit program, including CHP, was $5.72.

Greenhouse gas emissions standards and air quality 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 CO_2. Similarly, the amount of emissions for all pollutants associated with a particular CHP unit is not always provided. Where locational information is not available, the value of CO_2 emission reductions and NOx reductions will be calculated consistent with sections 9 and 11 above.

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.[8] 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 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;[9]

[8] 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.

[9] As explained in footnote 11, *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

- 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 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.[10]

3.14 Utility Costs

Utility costs incurred to achieve implementation of energy efficiency measures and programs are appropriate for inclusion in the RI 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.
- Marketing: These are the costs of marketing and advertising to promote a program. The costs also include the payroll and expenses to manage marketing.
- Cost of services and product rebates/incentives provided to customers: 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.[11] 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

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.

[10] 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.

[11] 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.

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.
- Performance 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 performance (shareholder) incentive is included in the cost of energy efficiency.

3.15 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.

In addition to the direct costs that customers face to purchase energy efficient equipment they may have additional costs for participating in energy efficiency programs that are not quantified and monetized. For example, a customer participating in a home energy assessment may need to spend some amount of time at home in order to facilitate the assessment, creating some time cost for the customer to participate. The magnitude and value of these additional potential time costs are unknown at this time. They would likely vary by sector, program, and possibly measure and are therefore challenging to estimate reliably.

4 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 2021 Annual Plan, all costs and benefits will be expressed in constant 2020 dollars. Where escalation of avoided costs or costs is needed to produce values in 2020 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 2020 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 2020 dollars, lifetime benefits thus calculated are discounted back to mid-2020 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 Least-Cost Procurement. Energy efficiency is a low-risk resource in terms of cost of capital risk, project risk, and portfolio risk.". Specifically for the 2021 Annual Plan, the Company used a real discount rate of 0.40% equal to the twelve-month average of the historic real yields from a ten-year United States Treasury note, using the 2019 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 + Non-embedded Greenhouse Gas Reduction Benefits + Economic Development Benefits + Non-embedded NOx Reduction Benefits + Value of Improved Reliability]

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 RI Test benefit cost ratio 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.[12]

[12] 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.

On a sector level, the cost of pilots, community based initiatives, sector financing, workforce development, 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.

5 Docket 4600 Benefit Cost Framework

Table 1. Alignment of RI Test to Docket 4600 Framework for 2021 Electric Energy Efficiency and Active Demand Response Portfolio

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
Power System Level	1	Energy Supply & Transmission Operating Value of Energy Provided or Saved	Quantified	$27,764,262	Energy Efficiency Measures: Winter peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this period by the avoided retail cost of winter peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	Benefit
				$-	Active Demand Response Measures: The Active Demand Response program (ConnectedSolutions) only operates during the Summer at system peak times, therefore there are no winter energy benefits.	No Value
			Quantified	$21,710,457	Energy Efficiency Measures: Winter off-peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this period by the avoided retail cost of winter off-peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	Benefit
				$-	Active Demand Response Measures: The Active Demand Response program (ConnectedSolutions) only operates during the Summer at system peak times, therefore there are no winter energy benefits.	No Value
			Quantified	$18,443,703	Energy Efficiency Measures: Summer peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this period by the avoided retail cost of Summer peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	Benefit
				$1,741	Active Demand Response Measures: Summer peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this	

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
					period by the avoided retail cost of Summer peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	
			Quantified	$11,689,649	Energy Efficiency Measures: Summer off-peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this period by the avoided retail cost of Summer off-peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	Benefit
				$1,413	Active Demand Response Measures: Summer off-peak electric energy (kWh) savings are monetized for winter peak by multiplying savings during this period by the avoided retail cost of Summer off-peak energy from Appendix B of the avoided cost schedules in the AESC 2018 study.	
			Quantified	$17,193,202	Energy Efficiency Measures: Value of avoided summer generation capacity benefit is monetized by the AESC 2018 study avoided costs	Benefit
				$1,109,695	Active Demand Response Measures: Value of avoided summer generation capacity benefit is monetized by the AESC 2018 study avoided costs	Benefit
	2	Renewable Energy Credit Cost / Value	Quantified	See Notes	Wholesale cost of RECs is included in the winter peak, winter off-peak, summer peak, and summer off-peak retail energy costs from the preceding category.	Benefit
	3	Retail Supplier Risk Premium	Quantified	See Notes	Wholesale Risk Premium is built into the retail costs of electric energy and electric capacity sourced from the AESC 2018 study and used to calculate the benefits of avoided energy and capacity.	Benefit
	4	Forward Commitment: Capacity Value	Quantified	See Notes	Forward capacity avoided costs are included in capacity benefits.	Benefit
	5	Forward Commitment: Avoided	Not applicable	See Notes	Not applicable to energy efficiency	Not Applica ble

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
		Ancillary Services Value				
	6	Utility / Third Party Developer Renewable Energy, Efficiency, or DER costs	Quantified	$116,806,026	National Grid costs to implement the energy efficiency portfolio (including active demand response measures). Total budget includes costs for Program Planning & Administration; Marketing; Customer Incentives; Sales Technical Assistance and Training; and Evaluation & Market Research	Cost
	7	Electric Transmission Capacity Costs / Value	Quantified	$22,819,412	Energy Efficiency: Electric transmission capacity benefits are quantified by multiplying a statewide Pooled Transmission Facility (PTF) transmission value from AESC 2018 study by the summer kW saved from efficiency measures	Benefit
				$4,320,857	Active Demand Response: Electric transmission capacity benefits are quantified by multiplying a statewide Pooled Transmission Facility (PTF) transmission value from AESC 2018 study by the summer kW saved from active Demand Response measures	Benefit
			Quantified	$19,816,620	Energy Efficiency: Electric distribution capacity benefits are quantified by multiplying a Company-generated distribution value ($/kW) by the summer kW saved from efficiency measures.	Benefit
				$3,752,279	Active Demand Response: Electric distribution capacity benefits are quantified by multiplying a Company-generated distribution value ($/kW) by the summer kW saved from active Demand Response measures	Benefit
	8	Electric transmission infrastructure costs for Site	Not applicable	See Notes	Currently no location-specific energy efficiency included, all measures offered across service territory.	Not Applica ble

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
		Specific Resources				
	9	Net risk benefits to utility system operations (generation, transmission, distribution)	Quantified	See Notes	Value of Improved Reliability benefit calculated based on reliability value from the AESC 2018 study multiplied by the avoided summer kW savings. Applies to both energy efficiency measures and active demand response measures. Values included in the row "Distribution system and customer reliability / resilience impacts"	Benefit
	10	Option value of individual resources	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	11	Investment under Uncertainty: Real Options Cost / Value	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	12	Energy Demand Reduction Induced Price Effect	Quantified	$38,763,007	Energy Efficiency measures: Electric Energy (kWh) DRIPE values quantified based on the energy DRIPE values included in the AESC 2018 study. Calculated for each of winter peak, winter off-peak, summer peak, and summer off-peak.	Benefit
				$1,532	Demand Response measures: Electric Energy (kWh) DRIPE values quantified based on the energy DRIPE values included in the AESC 2018 study. Calculated for each of winter peak, winter off-peak, summer peak, and summer off-peak.	Benefit

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
			Quantified	$2,349,055	Energy Efficiency measures: Electric Generation Capacity (kW) DRIPE value quantified by multiplying avoided summer kW by applicable capacity DRIPE values ($/kW) from the AESC 2018 study.	Benefit
			Quantified	$23,595,443	Demand Response measures; Electric Generation Capacity (kW) DRIPE value quantified by multiplying avoided summer kW by applicable capacity DRIPE values ($/kW) from the AESC 2018 study.	Benefit
			Quantified	See Fuel benefits	Additional DRIPE benefits for oil fuel savings from energy efficiency measures are quantified by multiplying oil fuel savings (MMBtu) by applicable oil DRIPE values ($/MMBtu) from the AESC 2018 study. These benefits are included in the category "Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water". Active demand response measures do not have oil fuel savings and therefore do not have oil DRIPE benefits.	
			Quantified	See notes	Gas Resource Benefits in the Electric energy efficiency Benefit Cost Model includes Gas Supply DRIPE and Gas-Electric Cross DRIPE monetized by multiplying the gas savings attributable to the electric portfolio measures by applicable avoided cost series from the AESC 2018 study. These benefits are included in the category "Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water". Active demand response measures do not have gas savings and therefore do not have gas DRIPE benefits.	
	13	Greenhouse gas compliance costs	Quantified	See notes	Cost of compliance with criteria air pollutant regulations are included in the wholesale electric energy commodity costs from the AESC 2018 study and are included in the calculation of the energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"	

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
	14	Criteria air pollutant and other environmental compliance costs	Quantified	See notes	Cost of compliance with criteria air pollutant regulations are included in the wholesale electric energy commodity costs from the AESC 2018 study and are included in the calculation of the energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"	
	15	Innovation and Learning by Doing	Qualified	Likely minimal value	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs. Likely a minimal value in comparison to other benefits included in RI Test, but possible value due to pilots, demonstrations, and assessments included in programs.	Benefit
	16	Distribution capacity costs	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	17	Distribution delivery costs	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	18	Distribution system safety loss/gain	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	19	Distribution system performance	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	20	Utility low income	Quantified	See Notes	Bad-debt write-offs and reduced arrearages are included as NEIs for income eligible programs. Aggregated with other NEIs in row "Program participant / prosumer benefits / costs"	Benefit
	21		Quantified	$100,836		Benefit

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
		Distribution system and customer reliability / resilience impacts		$523,690	Value of Improved Reliability benefit calculated based on reliability value from the AESC 2018 study multiplied by the avoided summer kW savings. Applies to both energy efficiency measures and active demand response measures.	Benefit
	22	Distribution system safety loss/gain	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
Customer Level	23	Program participant / prosumer benefits / costs	Quantified	$18,435,780	Energy Efficiency measures: Participant contribution cost is the direct cost of the measure that is not covered by the customer rebate/incentive for energy efficiency measures.	Cost
				$-	Active demand response measures: There is no customer cost for the ConnectedSolutions Active Demand Response program.	Cost
			Quantified	$47,968,696	Quantifiable non-resource, non-energy impacts are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2021 Annual Plan. Non resource, non-energy impacts may include but are not limited to labor, material, facility use, health and safety, materials handling, national security, property values, and transportation.	Benefit
	24	Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water	Quantified	$12,179,491	Energy Efficiency measures: Quantification of Resource Benefits from: Natural Gas, Oil, Propane, Water & Sewage. Natural Gas Benefits are based on Appendix C of the 2018 AESC study, Oil and Propane Benefits are based on Appendix D of the 2018 AESC study, Water & Sewage Benefits are derived from an internet survey of rates posted to the RI PUC website.	Benefit

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
				$-	Active demand response measures: no corresponding benefits for oil, gas, water, wastewater in the Active Demand Response benefit cost analysis so this value is zero	Benefit
	25	Low-Income Participant Benefits	Quantified	See Notes	Low-Income Participant Benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2021 Annual Plan. See the category "Program participant / prosumer benefits / costs" for these benefits	Benefit
	26	Consumer Empowerment & Choice	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	27	Non-participant (equity) rate and bill impacts	Quantified	See Notes	External to cost effectiveness analysis. Rate and Bill Impacts model the effects of efficiency programs on annual customer bills by aggregating rate and consumption changes, including non-participants. Electric and natural gas rate and bill impact models included in Attachment 7 of the 2021 Annual Plan	Benefit (but not included in BCA screening)
Societal Level	28	Greenhouse gas externality costs	Quantified	$36,202,413	Energy Efficiency measures: Quantified Non-embedded Greenhouse gas reduction benefits obtained from the 2018 AESC Study. Non-embedded CO2 values are sourced from the following tables in the 2018 AESC Study: Table 154 for electric savings and Table 156 for gas savings and oil savings.	Benefit
				$1,670	Active Demand Response measures: Quantified Non-embedded Greenhouse gas reduction benefits obtained from the 2018 AESC Study. Non-embedded CO2 values are sourced from the following tables in the 2018 AESC Study: Table 154 for electric savings and Table 156 for gas savings and oil savings.	Benefit
	29	Criteria air pollutant and	Quantified	$1,739,435	Quantified Non-embedded NOx reduction benefits obtained from the 2018 AESC Study. Additional research would be required to determine	Benefit

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
		other environmental externality costs			other benefit streams from air pollutants and other environmental externalities	
	30	Conservation and community benefits	Not Quantified or Qualified	See Notes	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.	Undetermined
	31	Non-energy costs/benefits: Economic Development	Quantified	$286,266,811	Energy efficiency measures: Quantified Economic Development Benefits based on the methodology described in the 2021 Annual Plan	Benefit
				$8,174,903	Active demand response measures: Quantified Economic Development Benefits based on the methodology described in the 2021 Annual Plan	Benefit
	32	Innovation and knowledge spillover (Related to demonstration projects and other RD&D preceding larger scale deployment)	Qualified	Likely minimal value	Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs. The portfolio of programs includes pilots, demonstrations and assessments and these likely generate benefits to further program and market development. The value of these innovation and knowledge spillover benefits is unknown but is estimated to be small in comparison to the overall magnitude of benefits currently included in the screening of the electric portfolio.	Benefit
	33	Societal Low-Income Impacts	Not Quantified or Qualified	See Notes	Low-Income Benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2021 Annual Plan however they are aggregated with other Non-Energy Impacts and therefore their value is not broken out here. These NEIs are included in the Program participant / prosumer benefits / costs category	Undetermined

Category Level	Cat. #	Mixed Benefit-Cost, Cost, or Benefit Category	Treatment in Benefit-Cost Analysis (Quantified, Qualified, Not Treated)	Value (NPV) or description if qualified	Description and Notes	Benefit or Cost
	34	Public Health	Quantified	See Notes	Health Benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2021 Annual Plan however they are aggregated with other Non-Energy Impacts and therefore their value is not broken out here. These NEIs are included in the Program participant / prosumer benefits / costs category	Benefit
	35	National Security and US international influence	Qualified	Likely minimal value	Non-energy impacts are not quantified. Were they to be included they would be aggregated with other NEIs in the benefit-cost screening. Likely a minimal value in comparison to other benefits included in RI Test	Benefit

Attachment 5

Table E-1
National Grid
Electric DSM Funding Sources in 2021 by Sector
$(000)

		Projections by Sector			
		Income Eligible Residential	**Non-Income Eligible Residential**	**Commercial & Industrial**	**Total**
(1)	**Projected Budget (from E-2):**	**$19,855.68**	**$41,146.51**	**$61,303.84**	**$122,306.03**
	Sources of Other Funding:				
(2)	Projected DSM Commitments at Year-End 2020:	$0.00	$0.00	$0.00	$0.00
(3)	Projected Year-End 2020 Fund Balance and Interest:	$0.00	$352.71	$19,608.97	$19,961.68
(4)	Projected FCM Payments from ISO-NE:	$486.50	$6,234.50	$9,297.00	$16,018.00
(5)	**Total Other Funding:**	**$486.50**	**$6,587.21**	**$28,905.97**	**$35,979.68**
(6)	**Customer Funding Required:**	**$19,369.18**	**$34,559.29**	**$32,397.87**	**$86,326.35**
(7)	**Forecasted kWh Sales:**	**200,673,797**	**2,571,376,629**	**3,834,494,965**	**6,606,545,391**
(8)	Energy Efficiency Program charge per kWh, excluding uncollectible recovery:				**$0.01306**
(9)	Proposed SRP Opex Factor per kWh, excluding uncollectible recovery:				$0.00000
(10)	Total Proposed Energy Efficiency Charge per kWh, excluding uncollectible recovery:				$0.01306
(11)	Currently Effective Uncollectible Rate				1.30%
(12)	**Proposed Energy Efficiency Program Charge per kWh, including Uncollectible Recovery:**				$0.01323
(13)	Currently Effective Energy Efficiency Program Charge per kwh				$0.01323
(14)	Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism				$0.00000

Notes:
(1) Projected Budget from E-2 includes OER and EERMC costs allocated to each sector based on forecasted sales.
(2) DSM Commitments are projects that are under construction with anticipated completion in 2021.
(3) Fund balance projections include projected revenue and spend through year end with Income Eligible sector set to $0 through projected subsidization from other sectors, minus commitments which are illustrated separately on line (2). The Company proposes to refile this table with updated Fund Balance projections on December 1, 2020 as proposed in Section 12.1 of the Plan's Main Text.

(3a) The Fund balance projection includes a credit and interest in the amount of $469,641.16 pursuant to the PUC Open Meeting on September 1, 2020 in relation to Docket No. 4755 and the Navy CHP Settlement Agreement.
(4) The total projection of FCM revenue is allocated by kWh sales to each sector.
(5) Line (2) + Line (3) + Line (4)
(6) Line (1) - Line (5)
(7) Per Company Forecast
(8) Line (6) ÷ Line (7), truncated to 5 decimal places
(9) Truncated to 5 decimal places
(11) Proposed SRP Opex Factor is $0.00000.
(10) Line (8) + Line (9)
(11) Uncollectible rate approved in Docket No 4770.
(12) Line (10) ÷ (1-Line (11), truncated to 5 decimal places
(13) Currently Effective EE Charge includes System Reliability Factor and uncollectible recovery.
(14) Line (13) - Line (12)

Table E-2
National Grid
2021 Electric Energy Efficiency Program Budget ($000)

	Program Planning & Administration	Marketing	Cost of services and product rebates/incentives provided to customers	Sales, Technical Assistance & Training	Evaluation & Market Research	Total Performance Incentive	Grand Total
Non-Income Eligible Residential							
Residential New Construction	$64.5	$24.0	$831.8	$458.6	$165.4		$1,544.3
ENERGY STAR® HVAC	$83.8	$278.3	$2,584.5	$480.3	$60.9		$3,487.8
Energy*Wise*	$381.8	$406.5	$14,772.2	$1,247.4	$225.4		$17,033.3
Energy*Wise* Multifamily	$88.7	$48.0	$2,482.0	$406.6	$31.5		$3,056.8
ENERGY STAR® Lighting	$237.6	$560.4	$4,057.2	$231.6	$187.8		$5,274.8
Residential Consumer Products	$71.8	$531.5	$1,486.1	$542.5	$49.3		$2,681.2
Home Energy Reports	$44.8	$10.5	$0.0	$2,550.8	$35.6		$2,641.7
Residential ConnectedSolutions	$37.2	$12.7	$1,369.2	$350.7	$190.0		$1,959.7
Energy Efficiency Education Programs	$0.0	$40.0	$0.0	$0.0	$0.0		$40.0
Residential Pilots	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0
Community Based Initiatives - Residential	$29.5	$112.3	$84.4	$0.0	$0.0		$226.2
Comprehensive Marketing - Residential	$2.3	$330.4	$0.0	$0.0	$0.0		$332.7
Residential Workforce Development	$0.0	$0.0	$0.0	$284.7	$0.0		$284.7
Residential Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$1,925.0	$1,925.0
Subtotal - Non-Income Eligible Residential	**$1,042.2**	**$2,354.6**	**$27,667.4**	**$6,553.2**	**$945.9**	**$1,925.0**	**$40,488.3**
Income Eligible Residential							
Single Family - Income Eligible Services	$317.1	$141.0	$11,023.0	$2,126.2	$152.1		$13,759.3
Income Eligible Multifamily	$116.2	$9.9	$4,243.2	$406.3	$55.2		$4,830.8
Income Eligible Workforce Development	$0.0	$0.0	$0.0	$114.2	$0.0		$114.2
Income Eligible Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$1,100.0	$1,100.0
Subtotal - Income Eligible Residential	**$433.3**	**$150.9**	**$15,266.2**	**$2,646.7**	**$207.2**	**$1,100.0**	**$19,804.3**
Commercial & Industrial							
Large Commercial New Construction	$218.6	$352.0	$5,872.2	$1,893.6	$163.9		$8,500.2
Large Commercial Retrofit	$885.7	$266.0	$24,825.0	$5,111.19	$842.4		$31,930.2
Small Business Direct Install	$278.3	$281.2	$7,934.3	$338.9	$50.9		$8,883.6
Commercial ConnectedSolutions	$88.1	$7.6	$2,680.0	$214.5	$0.0		$2,990.1
Commercial Pilots	$0.0	$0.0	$0.0	$0.0	$0.0		$0.0
Community Based Initiatives - C&I	$9.8	$36.6	$28.1	$0.0	$0.0		$74.5
Finance Costs	$0.0	$0.0	$5,000.0	$0.0	$0.0		$5,000.0
Commercial Workforce Development	$0.0	$0.0	$0.0	$468.7	$0.0		$468.7
Commercial & Industrial Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$2,475.0	$2,475.0
Subtotal - Commercial & Industrial	**$1,480.5**	**$943.2**	**$46,339.6**	**$8,026.8**	**$1,057.2**	**$2,475.0**	**$60,322.3**
Regulatory							
OER	$845.6	$0.0	$0.0	$0.0	$0.0		$845.6
EERMC	$845.6	$0.0	$0.0	$0.0	$0.0		$845.6
Subtotal - Regulatory	**$1,691.1**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$1,691.1**
Grand Total	**$4,647.1**	**$3,448.8**	**$89,273.1**	**$17,226.7**	**$2,210.4**	**$5,500.0**	**$122,306.0**

Notes:

(1) 2021 Large Commercial Retrofit Commitments ($000):

(2) For more information on Finance Costs, please refer to Attachment 2, Section 9.

(3) OER and EERMC total 2.0% of customers' EE Program Charge collected on Table E-1, minus 2%.

(4) Finance Costs are detailed in Table E-9.

(5) Demonstrations and Assessments budgets are included in specific program level budgets listed above. More information on Demonstration and Assessments descriptions, budgets, and which program level budget they are included in can be found in Attachment 8.

Table E-3
National Grid
Derivation of the 2021 Spending and Implementation Budgets ($000)

	Proposed 2021 Budget From E-2	Commitments	Regulatory Costs	Performance Incentive	Eligible Sector Spending Budget for Performance Incentive on E-9	Implementation Expenses for Cost-Effectiveness on E-5
Non-Income Eligible Residential						
Residential New Construction	$1,544.3					$1,544.3
ENERGY STAR® HVAC	$3,487.8					$3,487.8
EnergyWise	$17,033.3					$17,033.3
EnergyWise Multifamily	$3,056.8					$3,056.8
ENERGY STAR® Lighting	$5,274.8					$5,274.8
Residential Consumer Products	$2,681.2					$2,681.2
Home Energy Reports	$2,641.7					$2,641.7
Residential ConnectedSolutions	$1,959.7					$1,959.7
Energy Efficiency Education Programs	$40.0					$40.0
Residential Pilots	$0.0					$0.0
Community Based Initiatives - Residential	$226.2					$226.2
Comprehensive Marketing - Residential	$332.7					$332.7
Residential Workforce Development	$284.7					$284.7
Residential Performance Incentive	$1,925.0			$1,925.0		$0.0
Subtotal - Non-Income Eligible Residential	**$40,488.3**	**$0.0**	**$0.0**	**$1,925.0**	**$36,597.1**	**$38,563.3**
Income Eligible Residential						
Single Family - Income Eligible Services	$13,759.3					$13,759.3
Income Eligible Multifamily	$4,830.8					$4,830.8
Income Eligible Workforce Development	$114.2					$114.2
Income Eligible Performance Incentive	$1,100.0			$1,100.0		$0.0
Subtotal - Income Eligible Residential	**$19,804.3**	**$0.0**	**$0.0**	**$1,100.0**	**$18,704.3**	**$18,704.3**
Commercial & Industrial						
Large Commercial New Construction	$8,500.2	$0.0				$8,500.2
Large Commercial Retrofit	$31,930.2	$0.0				$31,930.2
Small Business Direct Install	$8,883.6	$0.0				$8,883.6
Commercial ConnectedSolutions	$2,990.1					$2,990.1
Commercial Pilots	$0.0					$0.0
Community Based Initiatives - C&I	$74.5					$74.5
Finance Costs	$5,000.0					$5,000.0
Commercial Workforce Development	$468.7					$468.7
Commercial & Industrial Performance Incentive	$2,475.0			$2,475.0		$0.0
Subtotal - Commercial & Industrial	**$60,322.3**	**$0.0**	**$0.0**	**$2,475.0**	**$54,773.0**	**$57,847.3**
Regulatory						
OER	$845.6		$845.6			$845.6
EERMC	$845.6		$845.6			$845.6
Subtotal - Regulatory	**$1,691.1**	**$0.0**	**$1,691.1**	**$0.0**	**$0.0**	**$1,691.1**
Grand Total	**$122,306.0**	**$0.0**	**$1,691.1**	**$5,500.0**	**$110,074.4**	**$116,806.0**

Notes:
(1) Eligible Sector Spending Budget = Total Budget from E-2 minus commitments, regulatory costs, pilots, assessments, Residential ConnectedSolutions, Commercial ConnectedSolutions, Performance Incentive
(2) Eligible Sector Spending Budget does not include assessments, see Attachment 8 for assessments budgets.
(3) Implementation Expenses = Total Budget from E-2 minus commitments and Performance Incentive.

Table E-4
National Grid
Proposed 2021 Budget Compared to Approved 2020 Budget ($000)

	Proposed Implementation Budget 2021	Approved Implementation Budget 2020	Difference
Non-Income Eligible Residential			
Residential New Construction	$1,544.3	$973.5	$570.9
ENERGY STAR® HVAC	$3,487.8	$2,525.1	$962.7
Energy*Wise*	$17,033.3	$15,692.2	$1,341.2
Energy*Wise* Multifamily	$3,056.8	$2,804.3	$252.5
ENERGY STAR® Lighting	$5,274.8	$15,375.8	-$10,101.1
Residential Consumer Products	$2,681.2	$2,199.2	$482.1
Home Energy Reports	$2,641.7	$2,728.1	-$86.4
Residential ConnectedSolutions	$1,959.7	$461.6	$1,498.1
Energy Efficiency Education Programs	$40.0	$40.0	$0.0
Residential Pilots	$0.0	$287.8	-$287.8
Community Based Initiatives - Residential	$226.2	$203.9	$22.3
Comprehensive Marketing - Residential	$332.7	$382.3	-$49.6
Residential Workforce Development	$284.7	$0.0	$284.7
Subtotal - Non-Income Eligible Residential	**$38,563.3**	**$43,673.8**	**-$5,110.5**
Income Eligible Residential			
Single Family - Income Eligible Services	$13,759.3	$12,846.1	$913.2
Income Eligible Multifamily	$4,830.8	$3,549.0	$1,281.8
Income Eligible Workforce Development	$114.2	$0.0	$114.2
Subtotal - Income Eligible Residential	**$18,704.3**	**$16,395.1**	**$2,309.2**
Commercial & Industrial			
Large Commercial New Construction	$8,500.2	$5,335.7	$3,164.4
Large Commercial Retrofit	$31,930.2	$23,801.3	$8,128.9
Small Business Direct Install	$8,883.6	$7,568.6	$1,315.0
Commercial ConnectedSolutions	$2,990.1	$2,078.5	$911.6
Community Based Initiatives - C&I	$74.5	$66.1	$8.4
Commercial Pilots	$0.0	$106.3	-$106.3
Finance Costs	$5,000.0	$5,216.7	-$216.7
Commercial Workforce Development	$468.7	$0.0	$468.7
Subtotal Commercial & Industrial	**$57,847.3**	**$44,173.2**	**$13,674.1**
Regulatory			
EERMC	$845.6	$893.7	-$48.1
OER	$845.6	$893.7	-$48.1
Subtotal Regulatory	**$1,691.1**	**$1,787.4**	**-$96.3**
TOTAL IMPLEMENTATION BUDGET	**$116,806.0**	**$106,029.5**	**$10,776.6**
OTHER EXPENSE ITEMS			
Commitments	$0.0	$0.0	$0.0
Company Incentive	$5,500.0	$5,054.4	$445.6
Subtotal - Other Expense Items	**$5,500.0**	**$5,054.4**	**$445.6**
TOTAL BUDGET	**$122,306.0**	**$111,083.9**	**$11,222.1**

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) The Energywise program increased the number of planned weatherizations due to savings identified in the potential study. The program is also incorporating new offerings such as moderate income incentive (100% insulation incentive) to further support equity efforts.

(4) The Energy Star® Lighting program year-over-year declines are driven by decreased opportunities for this program due to market transformation

(5) The Income Eligible Multifamily program year-over-year budget increases are driven by increases in custom measure quanities, specifically electric resistance Air Source Heat Pump offerings.

(6) The Large Commercial New Construction program had an increase in measure quantities specifically HVAC prescriptive measures, lighting controls. Increase in quantities in the custom measure category, specifically HVAC and refrigeration resulting in increased incentive costs. Increase in budgets to accommodate new Zero Net Energy pathways, that increase incentives for TA studies and commissioning support for customers.

(7) The Large Commercial Retrofit program had an increase in savings from lighting and HVAC control measures that were identified in the potential study, for which incentive costs per kWh are higher. Additionally, increase in budgets to develop the Energy Information Framework Platform to facilitate advanced insights to drive savings with customers.

(8) The Small Business Direct program is incorporating higher incentives for customers to increase participation in non-lighting measures. Increasing quantities for lighting controls with installed luminaires and retrofit kits with integrated controls.

Table E-5
National Grid
Calculation of 2021 Program Year Cost-Effectiveness
All Dollar Values in ($000)

	RI Test Benefit/ Cost[1]	Total Benefit	Program Implementation Expenses[2]	Customer Contribution	Performance Incentive	¢/Lifetime kWh
Non-Income Eligible Residential						
Residential New Construction	2.69	$6,445.3	$1,544.3	$855.7		13.3
ENERGY STAR® HVAC	2.77	$13,306.5	$3,487.8	$1,311.6		9.4
Energy*Wise*	1.89	$33,615.8	$17,033.3	$790.4		120.5
Energy*Wise* Multifamily	2.44	$8,756.5	$3,056.8	$532.0		17.6
Home Energy Reports	3.23	$8,530.8	$2,641.7	$0.0		9.8
ENERGY STAR® Lighting	3.29	$14,018.2	$5,274.8	-$1,012.9		15.9
Residential Consumer Products	2.84	$11,372.7	$2,681.2	$1,321.2		10.5
Residential ConnectedSolutions	6.13	$12,018.6	$1,959.7	$0.0		N/A
Energy Efficiency Education Programs			$40.0			
Residential Pilots			$0.0			
Community Based Initiatives - Residential			$226.2			
Comprehensive Marketing - Residential			$332.7			
Residential Workforce Development			$284.7			
Non-Income Eligible Residential SUBTOTAL	**2.44**	**$108,064.5**	**$38,563.3**	**$3,798.1**	**$1,925.0**	**21.6**
Income Eligible Residential						
Single Family - Income Eligible Services	2.65	$36,501.8	$13,759.3	$0.0		34.9
Income Eligible Multifamily	1.76	$8,502.4	$4,830.8	$0.0		15.2
Income Eligible Workforce Development			$114.2			
Income Eligible Residential SUBTOTAL	**2.27**	**$45,004.2**	**$18,704.3**	**$0.0**	**$1,100.0**	**26.3**
Commercial & Industrial						
Large Commercial New Construction	6.24	$58,649.1	$8,500.2	$893.1		5.0
Large Commercial Retrofit	7.52	$329,117.0	$31,930.2	$11,821.8		5.9
Small Business Direct Install	3.35	$36,190.8	$8,883.6	$1,922.8		10.3
Commercial ConnectedSolutions	9.85	$29,465.0	$2,990.1	$0.0		N/A
Commercial Pilots			$0.0			
Community Based Initiatives - C&I			$74.5			
Finance Costs			$5,000.0			
Commercial Workforce Development			$468.7			
C&I SUBTOTAL	**6.05**	**$453,421.9**	**$57,847.3**	**$14,637.7**	**$2,475.0**	**7.0**
Regulatory						
OER			$845.6			
EERMC			$845.6			
Regulatory SUBTOTAL			**$1,691.1**			
TOTAL	**4.31**	**$606,490.7**	**$116,806.0**	**$18,435.8**	**$5,500.0**	**10.4**

Notes:

(1) RI Test B/C Test = (Energy + Capacity + Resource Benefits + Economic Benefits + Carbon Benefits) / (Program Implementation + Customer Contribution + Performance Incentive)

Also includes effects of free-ridership and spillover.

(2) For Implementation Expenses derivation, see Table E-3.

(3) ENERGY STAR® Lighting customer cost is negative due to a high free-ridership rate. Any financial incentives paid to free-riders are counted as a cost because the Company incurred those costs as part of the overall cost of the Plan regardless of whether the participant is free-rider or not. Therefore the Company reduces benefits and the customer cost by the net-to-gross ratio but not the incentives.

Table E-5A
National Grid
Calculation of 2021 Program Year Cost-Effectiveness with TRC Test
All Dollar Values in ($000)

	TRC Benefit/ Cost[1]	Total Benefit	Program Implementation Expenses[2]	Customer Contribution	Performance Incentive	¢/Lifetime kWh
Non-Income Eligible Residential						
Residential New Construction	1.55	$3,713.4	$1,544.3	$855.7		13.3
ENERGY STAR® HVAC	1.37	$6,557.3	$3,487.8	$1,311.6		9.4
Energy*Wise*	0.82	$14,677.8	$17,033.3	$790.4		120.5
Energy*Wise* Multifamily	1.19	$4,265.7	$3,056.8	$532.0		17.6
Home Energy Reports	1.90	$5,008.4	$2,641.7	$0.0		9.8
ENERGY STAR® Lighting	1.17	$4,988.9	$5,274.8	-$1,012.9		15.9
Residential Consumer Products	1.52	$6,092.4	$2,681.2	$1,321.2		10.5
Residential ConnectedSolutions	5.30	$10,390.0	$1,959.7			
Energy Efficiency Education Programs			$40.0			
Residential Pilots			$0.0			
Community Based Initiatives - Residential			$226.2			
Comprehensive Marketing - Residential			$332.7			
Residential Workforce Development			$284.7			
Non-Income Eligible Residential SUBTOTAL	**1.26**	**$55,694.0**	**$38,563.3**	**$3,798.1**	**$1,925.0**	**21.6**
Income Eligible Residential				$0.0		
Single Family - Income Eligible Services	1.61	$22,102.6	$13,759.3	$0.0		34.9
Income Eligible Multifamily	0.52	$2,494.0	$4,830.8	$0.0		15.2
Income Eligible Workforce Development			$114.2			
Income Eligible Residential SUBTOTAL	**1.24**	**$24,596.7**	**$18,704.3**	**$0.0**	**$1,100.0**	**26.3**
Commercial & Industrial						
Large Commercial New Construction	2.87	$26,984.4	$8,500.2	$893.1		5.0
Large Commercial Retrofit	2.93	$127,987.1	$31,930.2	$11,821.8		5.9
Small Business Direct Install	1.47	$15,926.4	$8,883.6	$1,922.8		10.3
Commercial ConnectedSolutions	7.66	$22,916.6	$2,990.1			
Commercial Pilots			$0.0			
Community Based Initiatives - C&I			$74.5			
Finance Costs			$5,000.0			
Commercial Workforce Development			$468.7			
C&I SUBTOTAL	**2.59**	**$193,814.4**	**$57,847.3**	**$14,637.7**	**$2,475.0**	**7.0**
Regulatory						
OER			$845.6			
EERMC			$845.6			
Regulatory SUBTOTAL			**$1,691.1**			
TOTAL	**1.95**	**$274,105.0**	**$116,806.0**	**$18,435.8**	**$5,500.0**	**10.4**

Notes:
(1) TRC B/C Test = (Energy + Capacity + Resource Benefits) / (Program Implementation + Customer Contribution + Performance Incentive)
Also includes effects of free-ridership and spillover.
(2) For Implementation Expenses derivation, see Table E-3.
(3) ENERGY STAR® Lighting customer cost is negative due to a high free-ridership rate. Any financial incentives paid to free-riders are counted as a cost because the Company incurred those costs as part of the overall cost of the Plan regardless of whether the participant is free-rider or not. Therefore the Company reduces benefits and the customer cost by the net-to-gross ratio but not the incentives.

Table E-6
National Grid
Summary of 2021 Benefits by Program (Energy Efficiency Measures)

	Benefits (000's)																	
		Capacity					Energy					Non Electric				Societal		
							Winter		Summer									
	Total	Summer Generation	Capacity DRIPE	Trans	Dist	Reliability	Peak	Off Peak	Peak	Off Peak	Energy DRIPE	Natural Gas	Oil	Other Resource	Non Resource	Carbon	NOx	Economic
Non-Income Eligible Residential																		
Residential New Construction	$6,445	$75	$5	$95	$83	$0	$421	$501	$182	$124	$363	$0	$280	$1,543	$42	$536	$34	$2,162
ENERGY STAR® HVAC	$13,307	$270	$0	$343	$298	$1	$1,471	$1,639	$184	$141	$1,296	$609	$93	-$11	$225	$1,685	$112	$4,953
Energy*Wise*	$33,616	$286	$104	$374	$325	$2	$284	$265	$213	$167	$515	$0	$10,555	$200	$1,386	$2,750	$347	$15,841
Energy*Wise* Multifamily	$8,757	$224	$36	$281	$244	$1	$126	$114	$152	$116	$215	$0	$646	$28	$2,083	$364	$30	$4,096
Home Energy Reports	$8,531	$251	$1,287	$406	$352	$10	$692	$560	$317	$213	$920	$0	$0	$0	$0	$843	$38	$2,642
ENERGY STAR® Lighting	$14,018	$291	$789	$466	$404	$7	$671	$537	$302	$200	$1,206	-$260	-$325	-$120	$822	$632	$11	$8,387
Residential Consumer Products	$11,373	$487	$14	$729	$633	$5	$750	$732	$459	$402	$1,806	$16	$40	$18	$0	$1,150	$54	$4,075
Non-Income Eligible Residential SUBTOTAL	**$96,046**	**$1,884**	**$2,236**	**$2,693**	**$2,339**	**$27**	**$4,415**	**$4,349**	**$1,809**	**$1,363**	**$6,321**	**$364**	**$11,289**	**$1,658**	**$4,558**	**$7,960**	**$626**	**$42,156**
Income Eligible Residential																		
Single Family - Income Eligible Services	$36,502	$486	$53	$622	$540	$2	$844	$851	$425	$394	$985	$105	$5,468	$386	$10,940	$2,336	$230	$11,833
Income Eligible Multifamily	$8,502	$47	$17	$61	$53	$0	$72	$67	$39	$31	$100	$0	$655	$44	$1,307	$235	$25	$5,749
Income Eligible Residential SUBTOTAL	**$45,004**	**$533**	**$70**	**$683**	**$593**	**$3**	**$917**	**$918**	**$464**	**$425**	**$1,085**	**$105**	**$6,123**	**$430**	**$12,248**	**$2,571**	**$255**	**$17,582**
Commercial & Industrial																		
Large Commercial New Construction	$58,649	$2,676	$0	$3,343	$2,903	$9	$4,146	$2,454	$3,316	$2,061	$4,673	-$377	$0	$4	$1,774	$5,006	$223	$26,436
Large Commercial Retrofit	$329,117	$11,123	$44	$14,776	$12,831	$57	$15,960	$12,734	$10,861	$6,924	$22,839	-$6,820	$0	$199	$26,459	$17,987	$550	$182,593
Small Business Direct Install	$36,191	$976	$0	$1,324	$1,150	$6	$2,326	$1,255	$1,994	$917	$3,844	-$796	$0	$0	$2,930	$2,678	$86	$17,501
C&I SUBTOTAL	**$423,957**	**$14,776**	**$44**	**$19,443**	**$16,885**	**$71**	**$22,433**	**$16,443**	**$16,171**	**$9,902**	**$31,356**	**-$7,993**	**$0**	**$203**	**$31,163**	**$25,671**	**$859**	**$226,529**
TOTAL	**$565,007**	**$17,193**	**$2,349**	**$22,819**	**$19,817**	**$101**	**$27,764**	**$21,710**	**$18,444**	**$11,690**	**$38,763**	**-$7,523**	**$17,412**	**$2,291**	**$47,969**	**$36,202**	**$1,739**	**$286,267**

Table E-6A
National Grid
Summary of 2021 Impacts by Program (Energy Efficiency Measures)

	Load Reduction in kW		Electric Energy Savings MWh		Electric Energy Savings MMBtu		Gas Saved MMBtu		Oil Saved MMBtu		Propane Saved MMBtu		Total Net Savings (Electric, Gas, Oil, Propane) MMBtu	
	Summer	Winter	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime	Annual	Lifetime
Non-Income Eligible Residential														
Residential New Construction	66	234	979	18,088	3,342	61,715	-	-	439	10,970	1,755	43,869	5,535	116,554
ENERGY STAR® HVAC	204	741	3,181	51,309	10,854	175,067	4,068	61,092	224	3,730	(26)	(340)	15,119	239,549
Energy*Wise*	452	519	2,861	14,788	9,762	50,455	-	-	21,868	419,783	310	5,131	31,941	475,370
Energy*Wise* Multifamily	223	173	1,729	20,391	5,900	69,573	-	-	1,046	25,326	-	-	6,946	94,899
Home Energy Reports	3,692	5,706	26,852	26,852	91,619	91,619	-	-	-	-	-	-	91,619	91,619
ENERGY STAR® Lighting	1,872	2,264	11,533	26,801	39,350	91,444	(12,634)	(25,268)	(7,679)	(15,359)	(1,982)	(3,964)	17,055	46,854
Residential Consumer Products	1,019	718	5,926	38,130	20,221	130,101	80	1,596	81	1,607	25	172	20,407	133,476
Non-Income Eligible Residential SUBTOTAL	**7,528**	**10,356**	**53,062**	**196,358**	**181,048**	**669,974**	**(8,486)**	**37,420**	**15,979**	**446,058**	**81**	**44,869**	**188,622**	**1,198,321**
Income Eligible Residential														
Single Family - Income Eligible Services	486	501	3,325	39,378	11,346	134,357	959	12,015	11,314	217,579	96	1,742	23,714	365,693
Income Eligible Multifamily	70	91	2,062	31,690	7,036	108,126	-	-	1,239	25,915	-	-	8,275	134,041
Income Eligible Residential SUBTOTAL	**557**	**592**	**5,387**	**71,068**	**18,382**	**242,483**	**959**	**12,015**	**12,553**	**243,494**	**96**	**1,742**	**31,989**	**499,734**
Commercial & Industrial														
Large Commercial New Construction	1,856	1,121	11,837	189,441	40,387	646,371	(2,944)	(41,220)	-	-	-	-	37,443	605,151
Large Commercial Retrofit	11,648	14,665	59,496	744,562	203,000	2,540,445	(57,130)	(744,835)	-	-	-	-	145,870	1,795,610
Small Business Direct Install	1,134	962	9,696	105,134	33,083	358,716	(8,030)	(86,616)	-	-	-	-	25,053	272,100
C&I SUBTOTAL	**14,638**	**16,747**	**81,029**	**1,039,136**	**276,471**	**3,545,532**	**(68,104)**	**(872,670)**	**-**	**-**	**-**	**-**	**208,366**	**2,672,861**
TOTAL	**22,723**	**27,695**	**139,478**	**1,306,562**	**475,900**	**4,457,988**	**(75,632)**	**(823,235)**	**28,531**	**689,552**	**177**	**46,610**	**428,977**	**4,370,916**

Table E-6B
National Grid
Summary of 2021 Demand Response Benefits and Savings

	Benefits (000's)												Load Reduction (MW)	MWh Saved	
		Capacity					Energy			Non Electric	Societal				
							Summer								
	Total	Summer Generation	Capacity DRIPE	Trans	Dist	Reliability	Peak	Off Peak	Energy DRIPE	Non Resource	Carbon	Economic	Summer	Annual	Lifetime
Non-Income Eligible Residential															
Residential ConnectedSol	$12,019	$410	$8,721	$630	$547	$76	$2	$1	$2	$0	$2	$1,627	5.7	0.1	0.1
Commercial & Industrial															
Commercial ConnectedSo	$29,465	$700	$14,874	$3,691	$3,205	$447	$0	$0	$0	$0	$0	$6,548	33.6	0.0	0.0
TOTAL	**$41,484**	**$1,110**	**$23,595**	**$4,321**	**$3,752**	**$524**	**$2**	**$1**	**$2**	**$0**	**$2**	**$8,175**	**39**	**0**	**0**

Table E-7
National Grid
Comparison of 2021 and 2020 Goals and Tracking

	Proposed 2021 Goal				Proposed 2021 Tracking		Approved 2020			Difference		
	Annual Electric Energy Savings (MWh)	Lifetime Electric Energy Savings (MWh)	Annual Summer Demand Savings (kW)	Active Demand Response (kW)	Total Net Lifetime Energy Savings (MMBtu)	Planned Unique Participants	Annual Electric Energy Savings (MWh)	Annual Summer Demand Savings (kW)	Active Demand Response (kW)	Annual Summer Demand Savings (kW)	Annual Energy Savings (MWh)	Demand Response (kW)
Non-Income Eligible Residential												
Residential New Construction	979	18,088	66		116,554	417	870	74		-9	110	
ENERGY STAR® HVAC	3,181	51,309	204		239,549	5,037	2,233	94		110	948	
Energy*Wise*	2,861	14,788	452		475,370	11,750	6,082	967		-515	-3,221	
Energy*Wise* Multifamily	1,729	20,391	223		94,899	4,000	2,793	364		-140	-1,063	
Home Energy Reports	26,852	26,852	3,692		91,619	323,248	23,239	3,195		497	3,613	
ENERGY STAR® Lighting	11,533	26,801	1,872		46,854	68,164	38,093	6,201		-4,329	-26,560	
Residential Consumer Products	5,926	38,130	1,019		133,476	33,111	4,768	714		305	1,158	
Residential ConnectedSolutions				5,739		4,178			1,672			4,066
Non-Income Eligible Residential SUBTOTAL	**53,062**	**196,358**	**7,528**	**5,739**	**1,198,321**	**449,906**	**78,077**	**11,609**	**1,672**	**-4,081**	**-25,015**	**4,066**
Income Eligible Residential		0										
Single Family - Income Eligible Services	3,325	39,378	486		365,693	3,630	3,755	566		-79	-430	
Income Eligible Multifamily	2,062	31,690	70		134,041	4,800	2,392	155		-85	-330	
Income Eligible Residential SUBTOTAL	**5,387**	**71,068**	**557**		**499,734**	**8,430**	**6,147**	**721**		**-164**	**-760**	
Commercial & Industrial		0										
Large Commercial New Construction	11,837	189,441	1,856		605,151	145	9,828	1,183		673	2,009	
Large Commercial Retrofit	59,496	744,562	11,648		1,795,610	2,882	72,871	14,933		-3,285	-13,375	
Small Business Direct Install	9,696	105,134	1,134		272,100	571	11,500	1,347		-213	-1,803	
Commercial ConnectedSolutions				33,600		180			49,000			-15,400
C&I SUBTOTAL	**81,029**	**1,039,136**	**14,638**	**33,600**	**2,672,861**	**3,778**	**94,198**	**17,463**	**49,000**	**-2,825**	**-13,169**	**-15,400**
TOTAL	**139,478**	**1,306,562**	**22,723**	**39,339**	**4,370,916**	**462,114**	**178,423**	**29,793**	**50,672**	**-7,070**	**-38,944**	**-11,334**

Notes:

(1) Planned 2021 participation takes into account net-to-gross and estimates unique participation by taking into account 2018 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%.

Table E-8
National Grid
2021 Targeted Performance Incentive

Sector	(1) Total Benefits (Without Economic Benefits) $(000)	(2) Programmatic Spending Budget $(000)	(3) Net Benefits $(000)	(4) Performance Incentive Payout Rate	(5) Design level Incentive Pool Allocation	(6) Target Incentive $(000)	(7) Threshold Net Benefits $(000)	(8) Threshold Incentive $(000)	(9) Maximum Net Benefits $(000)	(10) Maximum Incentive
Non-Income Eligible Residential	$53,890	$36,597	$17,293	11.132%	35%	$1,925	$11,240	$1,251	$21,616	$2,406
Income Eligible Residential	$27,423	$18,704	$8,718	12.617%	20%	$1,100	$5,667	$715	$10,898	$1,375
Commercial & Industrial	$197,428	$54,773	$142,655	1.735%	45%	$2,475	$92,726	$1,609	$178,318	$3,094
Equity Metric	NA	NA	NA	NA	0%	$0	NA	NA	NA	NA
Total	$278,740	$110,074	$168,666			$5,500	$109,633	$3,575	$210,832	$6,875

Notes

(1) Total Benefits exclude Economic Benefits. Equal to Column (1) - Column (18) in Table E-6

(2) Eligible Spending Budget excludes Commitments, Regulatory Costs, Pilots, Assessments, Residential ConnectedSolutions, Commercial ConnectedSolutions, Performance Incentive. See Column 6 in Table E-3 for details.

(3) Equal to Column (1) - Column (2)

(4) Earning Rate for the sector

(5) Distribution of design level total performance incentive pool to sectors

(6) Equal to Column (3) X Column (4)

(7) 65% of Column (3). No incentive is earned on Net Benefits in the sector unless the Company achieves at least this threshold level of performance.

(8) 65% of Column (6)

(9) 125% of Column (3). The Company earns no incentive on Net Benefits in the sector above this level of achieved performance. The programs may generate more benefits than this level, but this is the level of net benefits at which earning is capped.

(10) The maximum incentive that the Company would earn at benefit levels in (9)

Table E-9
National Grid
Revolving Loan Fund Projections

Large C&I Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2020**	**$ 18,547,780**
(2)	Current Loan Fund Balance	$ 7,408,566
	Loans Paid Year-To-Date	*$ 2,234,593*
	Repayments Year-To-Date	*$ 3,458,470*
(3)	Projected Additional Loans by Year End 2020	$ 3,250,825
(4)	Projected Additional Repayments by Year End 2020	$ 1,660,550
(5)	**Projected Year End Loan Fund Balance 2020**	**$ 5,818,292**
(6)	2020 Funding Injection	$ -
(7)	**Projected Loan Fund Balance, January 2021**	**$ 5,818,292**
(8)	Projected Repayments throughout 2021	$ 5,187,705
(9)	Estimated Loans in 2021	$ 9,563,358
(10)	**Projected Year End Loan Fund Balance 2021**	**$ 1,442,639**

Small Business Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2020**	**$ 3,303,570**
(2)	Current Loan Fund Balance	$ 2,597,443
	Loans Paid Year-To-Date	*$ 555,775*
	Repayments Year-To-Date	*$ 1,034,229*
(3)	Projected Additional Loans by Year End 2020	$ 276,160
(4)	Projected Additional Repayments by Year End 2020	$ 250,248
(5)	**Projected Year End Loan Fund Balance 2020**	**$ 2,571,531**
(6)	2020 Funding Injection	$ -
(7)	**Projected Loan Fund Balance, January 2021**	**$ 2,571,531**
(8)	Projected Repayments throughout 2021	$ 372,268
(9)	Estimated Loans in 2021	$ 1,500,000
(10)	**Projected Year End Loan Fund Balance 2021**	**$ 1,443,798**

Public Sector Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2020**	**$ 516,542**
(2)	Current Loan Fund Balance	$ 434,466
	Funds returned to OER	*$ -*
	Repayments Year-To-Date	*$ 112,745*
(3)	Projected Additional Loans by Year End	$ -
(4)	Projected Additional Repayments by Year End	$ 29,860
(5)	**Projected Year End Loan Fund Balance 2020**	**$ 464,326**
(6)	2020 Fund Injection	$ -
(7)	**Projected Loan Fund Balance, January 2021**	**$ 464,326**
(8)	Projected Repayments throughout 2021	$ 37,954
(9)	Estimated Loans in 2021	$ -
(10)	**Projected Year End Loan Fund Balance 2021**	**$ 502,280**

Efficient Buildings Fund

(1)	**Energy Efficiency Funds allocated to EBF through 2020**	**$ 22,087,113**
(2)	Total EBF Loans Outstanding	$ 17,792,489
	Loans Paid Year-To-Date	$ -
	Repayments Year-To-Date	$ -
(3)	Projected Additional Loans by Year End 2020	$ 27,200,000
(4)	Projected Additional Repayments by Year End 2020	$ 778,000
(5)	**Total EBF Loans Outstanding**	**$ 44,214,489**
(6)	2021 Fund Injection	$ 5,000,000
(7)	**2020 Beginning of Year EBF Loans Outstanding**	**$ 44,214,489**
(8)	Projected EBF Loan Repayments in 2021	$ 982,000
(9)	New EBF loans in 2021	$ 23,875,000
(10)	**Projected Year End 2021 EBF Loans Outstanding**	**$ 67,107,489**
(11)	Energy Efficiency Funds allocated to EBF through 2021	$ 27,087,113
(12)	Loans to Energy Efficiency Fund Contribution Ratio	2.5

Notes

1 Funding injections since loan funds began. Net of any adjustments.

2 Current Loan Fund Balance is through August 2020; it includes all loans and repayments made by August 2020. Public Sector Revolving Loan Fund reduced by transfers to RI PEP Incentives. EBF reports in terms of loans outstanding.

3 Projected Loans from September to Year-End 2020 is estimated based on projects currently under construction that are anticipated to be paid out by year-end. It is difficult to project this amount accurately due to the fact that projects could be delayed by a month or two resulting in payment occurring in 2021 instead of 2020.

4 Projected Repayments from September to Year-End 2020 is estimated based on the monthly average amount of repayments.

5 Equal to (2) - (3) + (4). EBF equal to (2) - (3) + (4)

6 Proposed Efficient Buildings Fund Injection detailed on Table E-2 under Finance Costs

7 Equal to (5) + (6). EBF equal to line (5).

8 Assumption based on monthly average repayments in 2020 over 12 month period; repayments accumulate over time and may vary widely.

9 Amount projected to be lent to customers in 2021

10 Equal to (7) + (8) - (9). EBF equal to (7) - (8) + (9).

Table E-10
National Grid
Rhode Island Electric Energy Efficiency 2003 - 2021
$(000)

Electric	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013[4]	2014	2015	2016	2017	2018	2019	2020[5]	2021[6]
Energy Efficiency Budget ($Million)[1]	$23.1	$22.6	$23.1	$22.4	$22.5	$21.0	$32.4	$37.6	$59.2	$61.4	$77.5	$87.0	$86.6	$87.5	$94.6	$94.6	$107.5	$111.1	$122.3
Spending Budget ($Million)[2]	$16.3	$15.8	$17.6	$16.5	$16.4	$14.7	$23.5	$28.8	$45.3	$55.3	$64.8	$80.6	$77.3	$77.6	$88.5	$88.7	$98.1	$101.1	$110.1
Actual Expenditures ($Million)[3]	$22.8	$19.5	$23.4	$23.7	$21.9	$19.2	$31.7	$29.7	$40.0	$50.7	$72.9	$85.3	$87.4	$78.4	$94.8	$93.0	$100.7		
Incentive Percentage[10]	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	N/A
Target Incentive[11]	$712,557	$781,959	$774,689	$726,627	$723,000	$647,689	$1,035,943	$1,267,043	$1,992,513	$2,434,131	$3,240,747	$4,032,000	$3,867,400	$3,878,087	$4,425,528	$4,436,022	$4,905,009	$5,054,448	$5,500,000
Earned Incentive	$712,557	$604,876	$795,648	$760,623	$716,075	$675,282	$1,085,888	$1,333,996	$1,929,273	$2,469,411	$2,997,681	$4,223,321	$4,533,360	$4,128,034	$4,829,847	$4,940,402	$3,290,237		
Annual Summer Demand kW Savings Goal Achieved (%)				106%	106%	113%	142%	78%	71%	83%	114%	78%	112%	101%	103%	116%	98%		
Annual MWh Energy Savings Goal Achieved (%)				111%	102%	111%	115%	107%	94%	93%	99%	105%	115%	107%	115%	110%	98%		
Energy Efficiency Program Charge ($/kWh)[7]	$0.00200	$0.00200	$0.00200	$0.00200	$0.00200	$0.00200	$0.00320	$0.00320	$0.00526	$0.00592	$0.00876	$0.00911	$0.00953	$0.01077	$0.01124	$0.00972	$0.01121	$0.01323	$0.01323
Annual Cost to 500 kWh/month Residential Customer w/o tax[8]	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$19.20	$19.20	$31.56	$35.52	$52.56	$54.66	$57.18	$64.62	$67.44	$58.32	$67.26	$79.38	$79.38
Annual Cost to 500 kWh/month Residential Customer w/ tax[9]	$12.50	$12.50	$12.50	$12.50	$12.50	$12.50	$20.00	$20.00	$32.88	$37.00	$54.75	$56.94	$59.56	$67.31	$70.25	$60.75	$70.06	$82.69	$82.69

Notes:

(1) Energy Efficiency Budget includes total expenditures and commitments. Includes all demand side management program-related expenses, including rebates, administration and general expenses, evaluation, commitments for future years and Company incentive.

(2) Prior to 2017, Spending Budget Eligible for Shareholder Incentive includes: Implementation, Administration, General, and Evaluation Expenses; excludes EERMC and OER Costs, Commitments, Copays, and Outside Finance Costs. Beginning in 2017, Outside Finance Costs were also included. Beginning in 2018 Pilot expenses were also excluded. Beginning in 2019 ConnectedSolutions expenses and assessments were also excluded.

(3) Actual Expenditures is actual spend during calendar year. Includes expenditures and commitments. Includes all demand side management program-related expenses, including rebates, administration and general expenses, evaluation, commitments for future years and Company incentive.

(4) In the Company's gas and electric rate cases in docket 4323, the PUC approved the uncollectibles gross-up in the electric EE Program Charge effective February 1, 2013, and a new rate applicable to the gross-up of the gas EE Program Charge, effective February 1, 2013.

(5) 2020 values are planned.

(6) 2021 values are proposed.

(7) Beginning in 2012, the EE Program Charge includes the System Reliability Factor. It does not include the $0.0003 renewables per RI General Laws §39-2-1.2 and Order #19608, which appears on customer bills.

(8) Reflects the annual cost excluding Gross Earnings Tax.

(9) Reflects the annual cost including Gross Earnings Tax.

(10) Incentive percentage not applicable for 2021 due to new performance incentive mechanism developed for the 2021 Annual Plan. See Section 12 of the Main Text of the 2021 Annual Plan for additional details.

(11) Target incentive is calculated in the same way as in 2020 in order to provide a more accurate estimate of the energy efficiency surcharge.

Attachment 6

Table G-1
National Grid
Gas DSM Funding Sources in 2021 by Sector
$(000)

		Projections by Sector			
		Income Eligible Residential	**Non-Income Eligible Residential**	**Commercial & Industrial**	**Total**
(1)	**Projected Budget (from G-2):**	**$10,494.10**	**$17,517.85**	**$10,604.66**	**$38,616.62**
	Sources of Other Funding:				
(2)	Projected Year-End 2019 Fund Balance and Interest:	$0.00	$1,919.14	$3,898.35	$5,817.49
(3)	Low Income Weatherization in Base Rates:	$0.00			$0.00
(4)	**Total Other Funding:**	**$0.00**	**$1,919.14**	**$3,898.35**	**$5,817.49**
(5)	**Customer Funding Required:**	**$10,494.10**	**$15,598.72**	**$6,706.31**	**$32,799.10**
(6)	Forecasted Firm Dth Volume	1,600,863	18,655,474	19,605,949	39,862,286
(7)	Forecasted Non Firm Dth Volume			230,757	230,757
(8)	Less: Exempt DG Customers			(1,485,040)	(1,485,040)
(9)	**Forecasted Dth Volume:**	**1,600,863**	**18,655,474**	**18,351,666**	**38,608,003**
(10)	Average Energy Efficiency Program Charge per Dth excluding Uncollectible Recovery:				$0.849
(11)	Proposed Energy Efficiency Program Charge per Dth excluding Uncollectible Recovery	$0.992	$0.992	$0.691	
(12)	Currently Effective Uncollectible Rate	1.91%	1.91%	1.91%	
(13)	**Proposed Energy Efficiency Program Charge per Dth, including Uncollectible Recovery:**	**$1.011**	**$1.011**	**$0.704**	
(14)	Currently Effective Energy Efficiency Program Charge per Dth	$1.011	$1.011	$0.704	
(15)	Adjustment to Reflect Fully Reconciling Funding Mechanism	$0.000	$0.000	$0.000	

Notes

(1) Projected Budget from G-2 includes OER and EERMC costs allocated to each sector based on forecasted volume.

(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 2021 EE Plan Table G-1. The Company proposes to refile this table with updated Fund Balance projections on December 1, 2020 as proposed in Section 12.1 of the Plan's Main Text.

(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. The C&I charge includes collection of $5.61 million of which $5.32 million will be allocated to the low income sector and $0.29 million to the residential sector.

(12) Uncollectible rate approved in Docket No. 4770.

Table G-2
National Grid
2021 Gas Energy Efficiency Program Budget ($000)

	Program Planning and Administration	Marketing	Cost of services and product rebates/incentives provided to customers	Sales, Technical Assistance and Training	Evaluation & Market Research	Performance Incentive	Grand Total
Non-Income Eligible Residential:							
ENERGY STAR® HVAC	$142.3	$213.8	$3,013.0	$167.3	$136.6	$0.0	$3,673.0
Energy*Wise*	$260.5	$85.0	$8,359.7	$1,140.2	$217.8	$0.0	$10,063.2
EnergyWise Multifamily	$56.6	$35.6	$1,216.0	$154.4	$29.0	$0.0	$1,491.6
Home Energy Reports	$11.0	$0.1	$0.0	$428.5	$11.3	$0.0	$450.9
Residential Pilots	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Residential New Construction	$37.9	$2.4	$491.2	$125.2	$18.1	$0.0	$674.8
Comprehensive Marketing - Residential	$0.2	$64.6	$0.0	$0.0	$0.0	$0.0	$64.8
Community Based Initiatives - Residential	$9.8	$37.9	$28.1	$0.0	$0.0	$0.0	$75.8
Residential Workforce Development	$0.0	$0.0	$0.0	$118.3	$0.0	$0.0	$118.3
Residential Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$595.0	$595.0
Subtotal - Non-Income Eligible Residential	**$518.4**	**$439.3**	**$13,108.0**	**$2,133.8**	**$412.9**	**$595.0**	**$17,207.4**
Income Eligible Residential:							
Single Family - Income Eligible Services	$160.5	$26.4	$5,253.0	$1,200.1	$98.8	$0.0	$6,738.8
Income Eligible Multifamily	$89.5	$6.2	$2,667.0	$414.6	$76.8	$0.0	$3,254.1
Income Eligible Workforce Development	$0.0	$0.0	$0.0	$49.6	$0.0	$0.0	$49.6
Income Eligible Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$425.0	$425.0
Subtotal - Income Eligible Residential	**$250.0**	**$32.6**	**$7,920.0**	**$1,664.3**	**$175.6**	**$425.0**	**$10,467.5**
Commercial & Industrial							
Large Commercial New Construction	$129.4	$190.1	$1,264.1	$1,076.8	$98.7	$0.0	$2,759.2
Large Commercial Retrofit	$245.1	$315.8	$2,988.8	$1,437.0	$182.5	$0.0	$5,169.1
Small Business Direct Install	$6.9	$40.4	$251.8	$32.9	$0.8	$0.0	$332.7
Commercial & Industrial Multifamily	$28.1	$22.4	$756.0	$144.2	$2.5	$0.0	$953.2
Commercial Pilots	$0.0	$7.5	$178.3	$25.0	$5.0	$0.0	$215.8
Finance Costs	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Community Based Initiatives - C&I	$3.3	$12.2	$9.4	$0.0	$0.0	$0.0	$24.8
Commercial Workforce Development	$0.0	$0.0	$0.0	$164.5	$0.0	$0.0	$164.5
Commercial & Industrial Performance Incentive	$0.0	$0.0	$0.0	$0.0	$0.0	$680.0	$680.0
Subtotal - Commercial & Industrial	**$412.8**	**$588.3**	**$5,448.4**	**$2,880.4**	**$289.4**	**$680.0**	**$10,299.3**
Regulatory							
EERMC	$321.2	$0.0	$0.0	$0.0	$0.0	$0.0	$321.2
OER	$321.2	$0.0	$0.0	$0.0	$0.0	$0.0	$321.2
Subtotal - Regulatory	**$642.5**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$642.5**
Grand Total	**$1,823.7**	**$1,060.2**	**$26,476.4**	**$6,678.5**	**$877.9**	**$1,700.0**	**$38,616.6**

Notes:

(1) OER and EERMC is equal to 2% of total collections from customers' Energy Efficiency Program Charge, reduced by 2%.

(2) Demonstrations and Assessments are included in specific program level budgets listed above. More information on Demonstration and Assessments descriptions, budgets, and which program level budget they are included in can be found in Attachment 8.

Table G-3
National Grid
Derivation of the 2021 Spending & Implementation Budgets ($000)

	Proposed 2020 Budget From G-2 ($000)	Outside Finance and Stakeholder Oversight Costs ($000)	Performance Incentive ($000)	Eligible Sector Spending Budget for Performance Incentive on G-9 ($000)[1]	Implementation Expenses for Cost-Effectiveness on G-5 ($000)[2]
Non-Income Eligible Residential					
ENERGY STAR® HVAC	$3,673.0				$3,673.0
Energy*Wise*	$10,063.2				$10,063.2
EnergyWise Multifamily	$1,491.6				$1,491.6
Home Energy Reports	$450.9				$450.9
Residential Pilots	$0.0				$0.0
Residential New Construction	$674.8				$674.8
Comprehensive Marketing - Residential	$64.8				$64.8
Community Based Initiatives - Residential	$75.8				$75.8
Residential Workforce Development	$118.3				$118.3
Residential Performance Incentive	$595.0		$595.0		$0.0
Subtotal - Non-Income Eligible Residential	**$17,207.4**	**$0.0**	**$595.0**	**$16,593.0**	**$16,612.4**
Income Eligible Residential					
Single Family - Income Eligible Services	$6,738.8				$6,738.8
Income Eligible Multifamily	$3,254.1				$3,254.1
Income Eligible Workforce Development	$49.6				$49.6
Income Eligible Performance Incentive	$425.0		$425.0		$0.0
Subtotal - Income Eligible Residential	**$10,467.5**	**$0.0**	**$425.0**	**$10,042.5**	**$10,042.5**
Commercial & Industrial					
Large Commercial New Construction	$2,759.2				$2,759.2
Large Commercial Retrofit	$5,169.1				$5,169.1
Small Business Direct Install	$332.7				$332.7
Commercial & Industrial Multifamily	$953.2				$953.2
Commercial Pilots	$215.8				$215.8
Finance Costs	$0.0	$0.0			$0.0
Community Based Initiatives - C&I	$24.8				$24.8
Commercial Workforce Development	$164.5				$164.5
Commercial & Industrial Performance Incentive	$680.0		$680.0		$0.0
Subtotal - Commercial & Industrial	**$10,299.3**	**$0.0**	**$680.0**	**$9,358.1**	**$9,619.3**
Regulatory					
EERMC	$321.2	$321.2			$321.2
OER	$321.2	$321.2			$321.2
Subtotal - Regulatory	**$642.5**	**$642.5**			**$642.5**
Grand Total	**$38,616.6**	**$642.5**	**$1,700.0**	**$35,993.6**	**$36,916.6**

Notes:

(1) Eligible Sector Spending Budget for Performance Incentive = Budget from G-2 minus Regulatory Costs, Pilots, Assessments, and Performance Incentive.

(2) Implementation Expenses = Budget from G-2 minus Performance Incentive.

(3) Eligible Sector Spending Budget does not include assessments, see Attachment 8 for assessments budgets.

Table G-4
National Grid
Proposed 2021 Budget Compared to Approved 2020 Budget ($000)

	Proposed Budget 2021 from G-2	2020 Approved Gas Budget	Difference
Non-Income Eligible Residential			
ENERGY STAR® HVAC	$3,673.0	$2,693.1	$980.0
EnergyWise	$10,063.2	$8,117.6	$1,945.6
EnergyWise Multifamily	$1,491.6	$1,512.1	-$20.5
Home Energy Reports	$450.9	$471.5	-$20.6
Residential Pilots	$0.0	$0.0	$0.0
Residential New Construction	$674.8	$620.5	$54.3
Comprehensive Marketing - Residential	$64.8	$79.9	-$15.1
Community Based Initiatives - Residential	$75.8	$68.9	$6.9
Residential Workforce Development	$118.3	$0.0	$118.3
Residential Performance Incentive	$595.0	$677.7	-$82.7
Subtotal - Non-Income Eligible Residential	**$17,207.4**	**$14,241.2**	**$2,966.2**
Income Eligible Residential			
Single Family - Income Eligible Services	$6,738.8	$5,952.3	$786.4
Income Eligible Multifamily	$3,254.1	$3,009.5	$244.6
Income Eligible Workforce Development	$49.6	$0.0	$49.6
Income Eligible Performance Incentive	$425.0	$448.1	-$23.1
Subtotal - Income Eligible Residential	**$10,467.5**	**$9,409.9**	**$1,057.6**
Commercial & Industrial			
Large Commercial New Construction	$2,759.2	$2,652.6	$106.6
Large Commercial Retrofit	$5,169.1	$4,889.1	$280.0
Small Business Direct Install	$332.7	$125.0	$207.6
Commercial & Industrial Multifamily	$953.2	$967.9	-$14.7
Commercial Pilots	$215.8	$366.0	-$150.2
Finance Costs	$0.0	$500.0	-$500.0
Community Based Initiatives - C&I	$24.8	$22.0	$2.8
Commercial Workforce Development	$164.5	$0.0	$164.5
Commercial & Industrial Performance Incentive	$680.0	$452.8	$227.2
Subtotal Commercial & Industrial	**$10,299.3**	**$9,975.5**	**$323.8**
Regulatory			
EERMC	$321.2	$361.2	-$40.0
OER	$321.2	$361.2	-$40.0
Subtotal Regulatory	**$642.5**	**$722.4**	**-$80.0**
TOTAL BUDGET	**$38,616.6**	**$34,349.0**	**$4,267.6**

Notes:

(1) Program Implementation Budget excludes Commitments, Company Incentive; derived on Table G-3

(2) Total Budget includes Implementation, Commitments; illustrated on Table G-3

(3) EnergyWise increased the number of planned weatherizations due to savings identified in the potential study. Also incorporating new offerings such as moderate income incentive (100% insulation incentive) to further support equity efforts.

Table G-5
National Grid
Calculation of 2021 Program Year Cost-Effectiveness
All Dollar Values in ($000)

	Rhode Island Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Performance Incentive	$/Lifetime MMBtu
Non-Income Eligible Residential						
Energy Star® HVAC	1.66	$13,615.7	$3,673.0	$4,539.3		$12.30
EnergyWise	2.01	$21,873.6	$10,063.2	$816.5		$19.82
EnergyWise MultiFamily	4.70	$8,630.2	$1,491.6	$344.0		$12.35
Home Energy Reports	4.05	$1,825.1	$450.9	$0.0		$4.82
Residential New Construction	1.02	$1,378.3	$674.8	$670.9		$15.78
Comprehensive Marketing - Residential			$64.8			
Community Based Initiatives - Residential			$75.8			
Residential Pilots			$0.0			
Residential Workforce Development			$118.3		$ 595.0	
Non-Income Eligible Residential Subtotal	**2.01**	**$47,322.9**	**$16,612.4**	**$6,370.8**	**$ 595.0**	$14.89
Income Eligible Residential						
Single Family - Income Eligible Services	2.94	$19,830.4	$6,738.8	$0.0		$29.75
Income Eligible Multifamily	4.21	$13,690.7	$3,254.1	$0.0		$9.24
Income Eligible Workforce Development			$49.6		$ 425.0	
Income Eligible Residential Subtotal	**3.20**	**$33,521.1**	**$10,042.5**	**$0.0**	**$ 425.0**	$17.36
Large Commercial & Industrial						
Large Commercial New Construction	4.86	$12,599.7	$2,759.2	-$166.4		$5.93
Large Commercial Retrofit	5.27	$45,068.7	$5,169.1	$3,387.0		$5.88
Small Business Direct Install	3.83	$1,539.9	$332.7	$69.4		$8.23
Commercial & Industrial Multifamily	4.75	$4,922.8	$953.2	$84.0		$7.31
Commercial Pilots			$215.8			
Community Based Initiatives - C&I			$24.8			
Finance Costs			$0.0			
Commercial Workforce Development			$164.5		$ 680.0	
Commercial & Industrial Subtotal	**4.69**	**$64,131.1**	**$9,619.3**	**$3,374.0**	**$ 680.0**	$6.24
Regulatory						
EERMC			$321.2			
OER			$321.2			
Regulatory Subtotal			**$642.5**			
Grand Total	**3.00**	**$144,975.1**	**$36,916.6**	**$9,744.8**	**$ 1,700.0**	$11.09

Notes:

(1) RI Test B/C Test = (Energy + Capacity + Resource Benefits+Economic Benefits + Carbon Benefits) / (Program Implementation + Customer Contribution + Performance Incentive)
Also includes effects of free-ridership and spillover.
(2) For Implementation Expenses derivation, see Table G-3.
(3) Large Commercial New Construction customer cost is negative due to a high free-ridership rate. Any financial incentives paid to free-riders are counted as a cost because the Company incurred those costs as part of the overall cost of the Plan regardless of whether the participant is free-rider or not. Therefore the Company reduces benefits and the customer cost by the net-to-gross ratio but not the incentives.

Table G-5A
National Grid
Calculation of 2021 Program Year Cost-Effectiveness with TRC Test
All Dollar Values in ($000)

	TRC Benefit/ Cost	Total Benefit	Program Implementation Expenses	Customer Contribution	Performance Incentive	$/Lifetime MMBtu
Non-Income Eligible Residential						
Energy Star® HVAC	0.91	$7,481.1	$3,673.0	$4,539.3		$12.30
EnergyWise	0.84	$9,134.8	$10,063.2	$816.5		$19.82
EnergyWise MultiFamily	3.00	$5,509.4	$1,491.6	$344.0		$12.35
Home Energy Reports	2.00	$901.9	$450.9	$0.0		$4.82
Residential New Construction	0.62	$840.0	$674.8	$670.9		$15.78
Comprehensive Marketing - Residential			$64.8			
Community Based Initiatives - Residential			$75.8			
Residential Pilots			$0.0			
Residential Workforce Development			$118.3			
Non-Income Eligible Residential Subtotal	**1.01**	**$23,867.3**	**$16,612.4**	**$6,370.8**	**$ 595.0**	**$14.89**
Income Eligible Residential						
Single Family - Income Eligible Services	1.79	$12,080.6	$6,738.8	$0.0		$29.75
Income Eligible Multifamily	2.16	$7,039.9	$3,254.1	$0.0		$9.24
Income Eligible Workforce Development			$49.6			
Income Eligible Residential Subtotal	**1.83**	**$19,120.6**	**$10,042.5**	**$0.0**	**$ 425.0**	**$17.36**
Large Commercial & Industrial						
Large Commercial New Construction	2.56	$6,643.7	$2,759.2	-$166.4		$5.93
Large Commercial Retrofit	2.93	$25,105.0	$5,169.1	$3,387.0		$5.88
Small Business Direct Install	1.81	$727.3	$332.7	$69.4		$8.23
Commercial & Industrial Multifamily	2.37	$2,454.4	$953.2	$84.0		$7.31
Commercial Demonstration and R&D			$215.8			
Community Based Initiatives - C&I			$24.8			
Finance Costs			$0.0			
Commercial Workforce Development			$164.5			
Commercial & Industrial Subtotal	**2.55**	**$34,930.5**	**$9,619.3**	**$3,374.0**	**$ 680.0**	**$6.24**
Regulatory						
EERMC			$321.2			
OER			$321.2			
Regulatory Subtotal			**$642.5**			
Grand Total	**1.61**	**$77,918.4**	**$36,916.6**	**$9,744.8**	**$ 1,700.0**	**$11.09**

Notes:
(1) TRC B/C Test = (Energy + Capacity + Resource Benefits) / (Program Implementation + Customer Contribution + Performance Incentive)
Also includes effects of free-ridership and spillover.
(2) For Implementation Expenses derivation, see Table G-3.
(3) Large Commercial New Construction customer cost is negative due to a high free-ridership rate. Any financial incentives paid to free-riders are counted as a cost because the Company incurred those costs as part of the overall cost of the Plan regardless of whether the participant is free-rider or not. Therefore the Company reduces benefits and the customer cost by the net-to-gross ratio but not the incentives.

Table G-6
National Grid
Summary of 2021 Benefits by Program

	Benefits ($000)			
			Non-Gas Benefits	
	Total	Natural Gas	Economic Benefit	Other Non-Gas Benefit
Non-Income Eligible Residential				
Energy*Wise*	$21,873.6	$5,296.0	$10,163.9	$6,413.7
Energy Star® HVAC	$13,615.7	$6,410.4	$3,048.6	$4,156.7
EnergyWise Multifamily	$8,630.2	$1,424.0	$2,431.3	$4,774.9
Home Energy Reports	$1,825.1	$859.7	$477.9	$487.5
Residential New Construction	$1,378.3	$822.0	$148.5	$407.8
Non-Income Eligible Residential SUBTOTAL	**$47,322.9**	**$14,812.2**	**$16,270.2**	**$16,240.5**
Income Eligible Residential				
Single Family - Income Eligible Services	$19,830.4	$2,198.3	$6,671.4	$10,960.8
Income Eligible Multifamily	$13,690.7	$4,007.9	$5,043.8	$4,639.0
Income Eligible Residential SUBTOTAL	**$33,521.1**	**$6,206.2**	**$11,715.2**	**$15,599.8**
Commercial & Industrial				
Large Commercial New Construction	$12,599.7	$3,542.4	$3,918.0	$5,139.3
Large Commercial Retrofit	$45,068.7	$12,449.2	$13,077.9	$19,541.7
Small Business Direct Install	$1,539.9	$403.9	$582.1	$553.9
Commercial & Industrial Multifamily	$4,922.8	$1,254.5	$1,801.6	$1,866.7
Commercial & Industrial SUBTOTAL	**$64,131.1**	**$17,649.9**	**$19,379.6**	**$27,101.6**
Grand Total	**$144,975.1**	**$38,668.3**	**$47,364.9**	**$58,941.9**

Notes:

1) Equal to the sum of Natural Gas benefits and Participant Resource benefits.

2) Non-Gas Benefits are equal to the dollar value of expected electricity savings and non-resource savings that have not been included in National Grid's electric energy efficiency plans for 2021.

Table G-6A
National Grid
Summary of 2021 Impacts by Program

	Gas Saved (MMBtu)	
	Annual	**Lifetime**
Non-Income Eligible Residential		
Energy*Wise*	23,963	549,037
Energy Star® HVAC	38,345	667,485
EnergyWise Multifamily	8,633	148,675
Home Energy Reports	93,548	93,548
Residential New Construction	4,445	85,272
Non-Income Eligible Residential SUBTOTAL	**168,933**	**1,544,017**
Income Eligible Residential		
Single Family - Income Eligible Services	11,325	226,500
Income Eligible Multifamily	15,858	352,022
Income Eligible Residential SUBTOTAL	**27,183**	**578,522**
Commercial & Industrial		
Large Commercial New Construction	27,631	437,398
Large Commercial Retrofit	187,283	1,455,776
Small Business Direct Install	4,886	48,861
Commercial & Industrial Multifamily	9,444	141,869
Commercial & Industrial SUBTOTAL	**229,243**	**2,083,905**
Grand Total	**425,359**	**4,206,444**

Notes:
1) Lifetime savings are equal to annual savings multiplied by the expected life of measures expected to be installed in each program.

Table G-7
National Grid
Comparison of 2021 and 2020 Goals

	Proposed 2021 Goal	Proposed 2021 Tracking		Approved 2020	Difference
	Annual Energy Savings (MMBtu Natural Gas)	**Lifetime 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*	23,963	549,037	1,966	25,621	-1,658
Energy Star® HVAC	38,345	667,485	4,348	29,994	8,351
EnergyWise Multifamily	8,633	148,675	4,000	14,561	-5,928
Home Energy Reports	93,548	93,548	152,324	115,426	-21,878
Residential New Construction	4,445	85,272	323	4,346	99
Non-Income Eligible Residential SUBTOTAL	**168,933**	**1,544,017**	**162,961**	**189,948**	**-21,015**
Income Eligible Residential					
Single Family - Income Eligible Services	11,325	226,500	1,161	10,096	1,229
Income Eligible Multifamily	15,858	352,022	3,500	24,413	-8,555
Income Eligible Residential SUBTOTAL	**27,183**	**578,522**	**4,661**	**34,508**	**-7,325**
Commercial & Industrial					
Large Commercial New Construction	27,631	437,398	61	45,474	-17,844
Large Commercial Retrofit	187,283	1,455,776	98	163,011	24,271
Small Business Direct Install	4,886	48,861	183	2,523	2,363
Commercial & Industrial Multifamily	9,444	141,869	729	11,155	-1,712
Commercial & Industrial SUBTOTAL	**229,243**	**2,083,905**	**1,071**	**222,164**	**7,079**
TOTAL	**425,359**	**4,206,444**	**168,694**	**446,621**	**-21,261**

Notes:
(1) Participants can participate in more than one program, for example Home Energy Reports and EnergyWise.
(2) Planned 2021 participation takes into account net-to-gross and estimates unique participation by taking into account 2019 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.

Table G-8
National Grid
2021 Targeted Performance Incentive

Sector	(1) Total Benefits (Without Macroeconomic Benefits) $(000)	(2) Programmatic Spending Budget $(000)	(3) Net Benefits $(000)	(4) Performance Incentive Payout Rate	(5) Design level Incentive Pool Allocation	(6) Target Incentive $(000)	(7) Threshold Net Benefits $(000)	(8) Threshold Incentive $(000)	(9) Maximum Net Benefits $(000)	(10) Maximum Incentive
Non-Income Eligible Residential	$31,053	$16,593	$14,460	4.115%	35%	$595	$9,399	$387	$18,075	$744
Income Eligible Residential	$21,806	$10,042	$11,763	3.613%	25%	$425	$7,646	$276	$14,704	$531
Commercial & Industrial	$44,752	$9,358	$35,393	1.921%	40%	$680	$23,006	$442	$44,242	$850
Equity Metric	NA	NA	NA	NA	NA	$0	NA	NA	NA	NA
Total	$97,610	$35,994	$61,617			$1,700	$40,051	$1,105	$77,021	$2,125

Notes

(1) Total Benefits exclude Economic Benefits. Equal to Column (1) - Column (18) in Table E-6

(2) Eligible Spending Budget excludes Commitments, Regulatory Costs, Pilots, Assessments, Residential ConnectedSolutions, Commercial ConnectedSolutions, Performance Incentive. See Column 6 in Table E-3 for details.

(3) Equal to Column (1) - Column (2)

(4) Earning Rate for the sector

(5) Distribution of design level total performance incentive pool to sectors

(6) Equal to Column (3) X Column (4)

(7) 65% of Column (3). No incentive is earned on Net Benefits in the sector unless the Company achieves at least this threshold level of performance.

(8) 65% of Column (6)

(9) 125% of Column (3). The Company earns no incentive on Net Benefits in the sector above this level of achieved performance. The programs may generate more benefits than this level, but this is the level of net benefits at which earning is capped.

(10) The maximum incentive that the Company would earn at benefit levels in (9)

Table G-9
National Grid
Revolving Loan Fund Projections

Large C&I Revolving Loan Fund

(1)	**Total Loan Fund Deposits Through 2020**	**$**	**3,590,440**
(2)	Current Loan Fund Balance	$	2,012,789
(3)	Projected Loans by Year End 2020	$	587,000
(4)	Projected Repayments by Year End 2020	$	187,104
(5)	**Projected Year End Loan Fund Balance 2020**	**$**	**1,612,893**
(6)	2019 Fund Injection	$	-
(7)	**Projected Loan Fund Balance, January 2021**	**$**	**1,612,893**
(8)	Projected Repayments throughout 2021	$	704,563
(9)	Estimated Loans in 2021	$	1,200,000
(10)	**Projected Year End Loan Fund Balance 2021**	**$**	**1,117,457**

Notes

1 Funding injections since loan funds began. Net of any adjustments.

2 Current Loan Fund Balance is through August 2020

3 Projected Loans by Year End 2020 is estimated based on current commitments

4 Projected Repayments by Year End 2020 is estimated based on projected loans by year end and repayment schedules

5 Equal to (2) - (3) + (4)

6 Fund Injection, as budgeted on G-2

7 Equal to (5) + (6)

8 Assumption based on average repayments over 12 months; repayments accumulate over time and may vary widely.

Table G-10
National Grid
Rhode Island Gas Energy Efficiency 2003 - 2021
$(000)

Gas	2007[4]	2008	2009	2010	2011[5]	2012	2013[6]	2014	2015	2016	2017	2018	2019	2020[7]	2021[8]
Energy Efficiency Budget ($Million)[1]	-	$7.3	$7.6	$4.8	$7.3	$13.7	$19.5	$23.5	$24.5	$27.7	$29.7	$28.1	$31.6	$34.3	$ 38.6
Spending Budget ($Million)[2]	-	$6.6	$6.1	$4.5	$6.2	$12.9	$17.9	$21.8	$22.4	$25.0	$27.8	$26.2	$29.2	$31.6	$ 36.0
Actual Expenditures ($Million)[3]	-	$7.4	$6.3	$5.5	$4.9	$13.3	$19.6	$21.5	$21.5	$24.6	$29.1	$28.8	$29.5		
Incentive Percentage[12]	-	4.4%	4.4%	4.4%	4.4%	4.4%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	NA
Target Incentive	-	$288,734	$266,980	$199,743	$274,460	$570,382	$898,285	$1,089,700	$1,119,800	$1,251,654	$1,387,550	$1,309,076	$1,460,570	$1,578,601	$1,700,000
Earned Incentive	-	$288,734	$262,121	$231,310	$239,863	$586,036	$968,229	$1,362,108	$1,387,079	$1,496,869	$1,633,531	$1,541,255	$1,580,119		
Annual MMBtu Energy Savings Goal Achieved (%)		109%	139%	127%	117%	99%	109%	124%	111%	106%	113%	120%	104%		
System Benefits Charge ($/therm) - all non-exempt customers[11]	$0.0071	$0.0107	$0.0150	$0.0150	$0.0411	$0.0384	$0.0417	-	-	-	-	-	-	-	-
Residential System Benefits Chare ($/therm)	-	-	-	-	-	-	-	$0.0600	$0.0781	$0.0748	$0.0888	$0.0869	$0.0715	$0.1011	$0.1011
C&I System Benefits Charge ($/therm)	-	-	-	-	-	-	-	$0.0492	$0.0637	$0.0487	$0.0726	$0.0671	$0.0420	$0.0704	$0.0704
Annual Cost to 846 Therm/year Residential Customer w/o tax[9]	$6.04	$9.05	$12.69	$12.69	$18.28	$32.49	$35.28	$50.76	$66.07	$63.28	$75.12	$73.52	$60.49	$85.53	$85.53
Annual Cost to 846 Therm/year Residential Customer w/tax[10]	$6.23	$9.33	$13.08	$13.08	$18.85	$33.49	$36.37	$52.33	$68.11	$65.24	$77.44	$75.79	$62.36	$88.18	$88.18

Notes:

(1) Energy Efficiency Budget includes total expenditures and commitments. Includes all demand side management program-related expenses, including rebates, administration and general expenses, evaluation, commitments for future years and Company incentive.

(2) Prior to 2017, Spending Budget Eligible for Shareholder Incentive includes: Implementation, Administration, General, and Evaluation Expenses; excludes EERMC and OER Costs, Commitments, Copays, and Outside Finance Costs. Beginning in 2017, Outside Finance Costs were also included. Beginning in 2018 Pilot expenses were also excluded. Beginning in 2019 ConnectedSolutions expenses and assessment were also excluded.

(3) Actual Expenditures is actual spend during calendar year. Includes expenditures and commitments. Includes all demand side management program-related expenses, including rebates, administration and general expenses, evaluation, commitments for future years and Company incentive.

(4) Gas programs began during July 2007 and were not reported on separately that year since programs were still in development. The 2007 gas programs are included in 2008 reporting. Systems Benefit Charge shown for 2007 is the weighted average of $0.063 per decatherm from January 1, 2007 - June 30, 2007 and $0.107 per decatherm from July 1, 2007 through December 31, 2008.

(5) On July 25, 2011 the Commission ordered that National Grid could increase the gas System Benefits Charge from $0.15 to $0.411 per decatherm for the period of August 1, 2011 through December 31, 2011. Annual cost represents 7 months usage (632 therms) at $0.015 per therm and 5 months usage (214 therms) at $0.0411 per therm.

(6) In the Company's gas and electric rate cases in docket 4323, the PUC approved the uncollectibles gross-up in the electric EE Program Charge effective February 1, 2013, and a new rate applicable to the gross-up of the gas EE Program Charge, effective February 1, 2013.

(7) 2020 values are planned.

(8) 2021 values are proposed.

(9) Reflects the annual cost excluding Gross Earnings Tax.

(10) Reflects the annual cost including Gross Earnings Tax.

(11) The Gas EE Program Charge was uniform for all customers until 2014, at which time the Company proposed and the PUC approved individual factors for the residential and C&I sectors.

(12) Incentive percentage not applicable for 2021 due to new performance incentive mechanism developed for the 2021 Annual Plan. See Section 12 of the Main Text of the 2021 Annual Plan for additional details.

Attachment 7

2021 Bill and Rate Impacts

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1 Summary

National Grid has performed analyses of the electric and gas bill impacts resulting from the proposed 2021 Energy Efficiency Program Plan pursuant to the updated Least Cost Procurement Standards approved by the RI PUC in Docket 5015. Bill impacts are distinct from rate impacts because they model the effects of efficiency programs on annual customer bills by aggregating rate and consumption changes. In the electric bill impact analysis, rate changes 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. In the electric model, other effects of energy efficiency beyond direct energy savings such as price suppression and avoided infrastructure investments are also included.

The gas bill and rate impact analysis use a new model that was developed by Synapse Energy Economics (Synapse) that improves upon the modeling approach for rate and bill impacts that was used in the 2020 and prior year plans. This new model uses a similar approach as the electric model to estimate the long-term impacts to rates and average bills due to the presence of energy efficiency in one year compared to a counterfactual with no efficiency programs. The new model is capable of outputting a comparable set of long term rate and bill impacts as included in the electric modeling in this year and in prior years and is described further in Section 4.

2 Key Findings

In the 2021 analysis, National Grid used the same methods for the electric bill impacts as in previous years. In the natural gas analysis, National Grid used the new modeling approach developed by Synapse Energy Economic (Synapse). The electric findings did not change dramatically from the 2020 Annual Plan analysis to the present 2021 Annual Plan analysis. Because of the change in methods for the natural gas analysis, the results are not directly comparable to prior years' analyses. Changes to the natural gas analysis are discussed in more detail in Section 4. The key findings of the bill impact analyses are:

- Most customers are participating in EE programs.
- In the electric portfolio, high participation means that over the lifetimes of the programs proposed for 2021, 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 energy savings from participation in electric EE programs results in bill savings that offset the costs of the EE program charge and revenue recovery.
- In the gas portfolio, the analysis shows slight long term average rate increases of between 0.3% and 0.7% depending on sector due to the 2021 annual plan. Participants in all programs and customer segment groupings see reductions in their long term bills due to their 2021 participation.

3 Electric Bill Impacts

3.1 Methodology

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 models analyze two cases: the fulfillment of the 2021 Plan and the absence of an efficiency plan in 2021. This comparison isolates the effects of the proposed 2021 EE program charge and Fully Reconciling Funding Mechanism. It assumes energy efficiency plans have been implemented before 2021 but will not be offered starting in 2021. The analysis also incorporates how system-wide reduction in energy consumption affects the different elements of rates such as transmission, distribution, and commodity charges.

As in the analysis in the 2020 Plan, five separate electric models were developed, one for each of the main customer segments: Residential, Income Eligible, Small Commercial, Medium 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.[1] 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 five models.[2] The diversity of the commercial customer profile means that customers from multiple rate classes can participate in any commercial program. Assumptions for these rate classes were made based on historical program participation data.[3]

Table 1. Electric Rate and Program Mapping

Electric Bill Impact Model	Rate Class(es)	Efficiency Programs
Residential Electric	A-16	Home Energy Reports
		EnergyStar HVAC
		EnergyWise Multifamily
		EnergyStar Lighting
		Residential Consumer Products
Income Eligible Electric	A-60	Income Eligible Single Family
		Income Eligible Multifamily

[1] The 2021 Annual Plan analysis maintains the approach of modeling five rate class groupings as used in the last year's annual plan to allow for a more realistic depiction of bill impacts because there is a wide array of usage among commercial customers and having more groupings helps illustrate typical impacts.

[2] Delivery service rate tariffs is R.I.P.U.C. Tariff No. 2095 for rates A-16 (basic residential rate), A-60 (low-income residential rate), C-06 (small C&I rate), G-02 (medium C&I rate), G-32 (large C&I rate). Standard Offer Service rates used in the analysis are R.I.P.U.C. No. 2096 and R.I.P.U.C. No. 4809 A-16 & A-60 total commodity charge for standard and low income residential rate group, C-06 total commodity charge for small C&I rate group, G-02 total commodity charge for medium C&I rate group and G-32 total commodity charge for large C&I rate group.

[3] Savings and participation modeled by C&I rate classes is partitioned and estimated based on historical data.

		Home Energy Reports
		EnergyStar Lighting
Small Commercial	C-06	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit
Medium Commercial	G-02	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit
Large Commercial	G-32, G-62	Small Business Direct Install
		Large Commercial New Construction
		Large Commercial Retrofit

3.2 Discussion and Interpretation of Electric Results

The results of the models are shown in Tables 2 through 6, 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 2021 to 2040 (positive numbers indicate rate increase).
- Typical energy savings refer to the average percentage of energy savings to total annual consumption from 2021 to 2040 (negative numbers indicate electricity consumption reduction).
- Typical bill savings are defined as average percentage of bill decrease to total customer bill from 2021 to 2040 (negative 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 five main customer segments. Average customers combine the bill impacts of EE participants and non EE participants to show the impacts of all customers combined. For the 2021 Bill Impact analysis the key finding is that over the lifetimes of the programs proposed for 2021 the average Rhode Island customer's (participants and non-participants combined) bill will be less than if there were no programs.

Table 2. Residential Bill Impact Analysis – A-16 (2021 EE Plan vs. No EE)

Residential	**Long-Term Rate Impacts**	**Typical Energy Savings**	**Typical Bill Savings**
	(% of Total Rate)	**(% per Participant)**	**(% of Total Bill)**
Average Participant	0.41%	-1.05%	-0.42%
Non-Participant	0.41%	0.00%	0.41%
Average Customer	0.41%	-1.05%	-0.42%

Table 3. Income-Eligible Bill Impact Analysis – A-60 (2021 EE Plan vs. No EE)4

Income-Eligible	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	1.23%	-3.72%	-2.54%
Non-Participant	1.23%	0.00%	1.23%
Average Customer	1.23%	-3.66%	-2.46%

Table 4. Small Commercial Bill Impact Analysis – C-06 (2021 EE Plan vs. No EE)5

Small Business	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	0.37%	-10.9%	-8.88%
Non-Participant	0.37%	0.00%	0.37%
Average Customer	0.37%	-1.14%	-0.81%

Table 5. Medium Commercial Bill Impact Analysis – G-02 (2021 EE Plan vs. No EE)

Medium C&I	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	0.03%	-9.05%	-9.02%
Non-Participant	0.03%	0.00%	0.03%
Average Customer	0.03%	-1.66%	-1.66%

Table 6. Large C&I Bill Impact Analysis – G-32, G-62 (2021 EE Plan vs. No EE)

Commercial & Industrial	Long-Term Rate Impacts (% of Total Rate)	Typical Energy Savings (% per Participant)	Typical Bill Savings (% of Total Bill)
Average Participant	-0.16%	-4.29%	-4.44%
Non-Participant	-0.16%	0.00%	-0.16%
Average Customer	-0.16%	-2.56%	-2.72%

On the residential side, rates increase for both the residential and income-eligible rate classes. For all rate classes non-participant bills increase slightly, while participant and average customer bills decrease. The

[4] 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, the participation and savings in these two programs are allocated based on the percent of residential customers in standard income and income-eligible rates. Income-eligible customers account for 7.7% of participation and 7.7% of savings in the two programs.

[5] For 2021, as in the 2020 Plan analysis, the small business (C-06 rate) customer count has been refined to better estimate customers. The number of accounts on the C-06 rate is greater than the number of customers, for example there are many accounts for cell towers, pumps, etc. that belong to one customer. This is an estimate based on the best data currently available to the Company.

reduction in average customer bills demonstrates that the scale of the energy savings due to program participation outweighs the incremental costs to implement the program.

On the commercial side, long-term rates increase slightly for small C&I and medium C&I customers, and decrease for large C&I customers. Overall, long term rate impacts are similar in terms of magnitude and direction across all rate classes from 2020 to 2021. For Small, Medium, and Large Commercial customers, bill savings occur for all customers (participants and non-participants), with the exception of slight bill increases (0.37%) for non-participant small business customers and (0.03%) for non-participant medium business customers.

- *Residential long-term rate impact*: 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 the EE program charge to the 2021 rate and bring the long-term rate increase down to 0.41% for standard residential customers and 1.23% for income-eligible residential customers.
- *Small, Medium, and Large C&I long-term rate impact*: Avoided infrastructure costs flow through rates and offset the EE program charge for 2021 and beyond, leading to a 0.37% increase in rates for small C&I customers, a 0.03% rate increase for medium C&I customers, and a 0.16% rate decrease for large C&I customers through 2040.
- *Average participant bill savings*: the proposed EE programs will bring bill savings to participants in all rate groups. Specifically, typical bill savings are 0.42% for standard residential participants, 2.54% for income-eligible residential participants, 8.88% for small C&I participants, 9.02% for medium C&I participants, and 4.44% for large C&I participants.
- For the 2021 Bill Impact Analysis, Commercial participation by rate class is assumed to be similar to historical participation from calendar year 2019.
- *Average customer typical bill savings*: among all participants and non-participants, typical bill savings are 0.42% for standard residential customers, 2.46% for income-eligible residential customers, 0.81% for small C&I customers, 1.66% for medium C&I customers, and 2.72% for large C&I customers, indicating that the proposed EE programs will bring net benefits to all types of electric customers in Rhode Island (Tables 2-6).

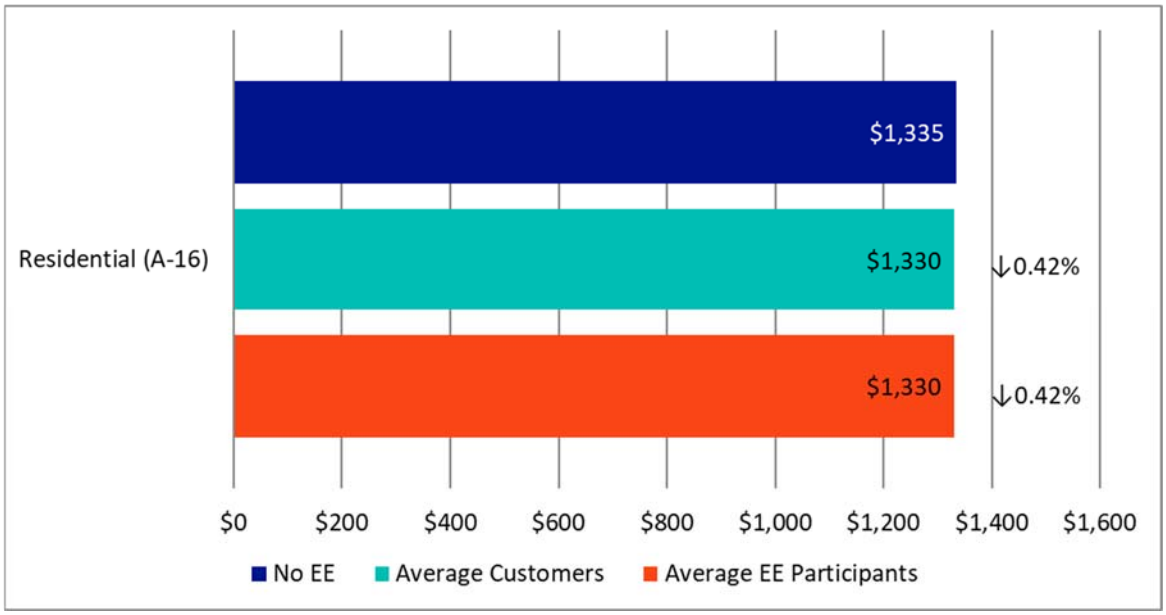
Figure 1 through Figure 5 show examples of electric bill reduction for average residential, income-eligible, small C&I, medium C&I and large C&I customers and participants. Bills are calculated based on average annual consumption of a typical customer in Rhode Island in each class, using the values in Table 7.

Table 7. Average Annual Consumption per Customer in Modeled Customer Classes[6]

Modeled Customer Class	Average Annual Per-Customer Consumption (kWh/year)
Residential (A-16)	6,764
Income-Eligible (A-60)	6,134
Small C&I (C-06)	33,885
Medium C&I (G-02)	151,049
Large C&I (G-32 and G-62)	2,143,795

In the figures below, the rates are the same as rates used in the bill impact analysis above. This illustration is different from traditional incremental bill impacts because it shows the long-term bill impact of the proposed EE programs and accounts for the measure life of the energy efficiency measures.

Figure 1. Example of Typical Residential (A-16) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)



[6] Average per-customer annual consumption is calculated based on the forecast electric consumption for each rate class for 2021 and the latest customer counts, for all classes except small business C-06. The small business (C-06 rate) average customer consumption has been refined to better estimate customers based on best data currently available to the Company for both count of customers and their annual consumption. The number of accounts on the C-06 rate is greater than the number of customers, for example there are many accounts for cell towers, pumps, etc. that belong to one customer.

Figure 2. Example of Typical Income Eligible (A-60) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

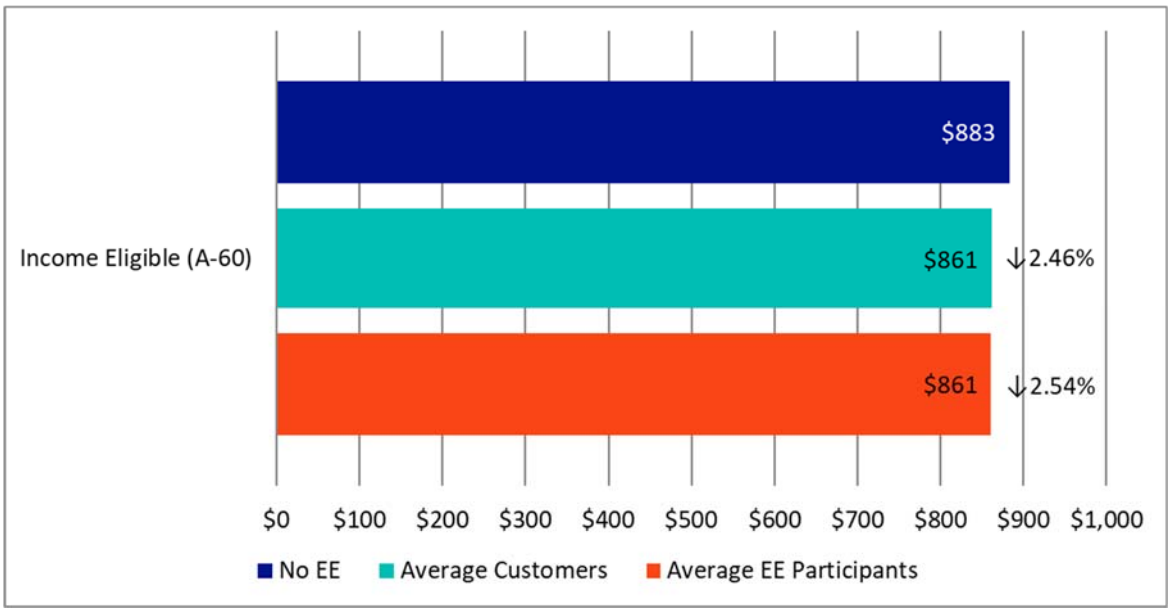


Figure 3. Example of Typical Small C&I (C-06) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

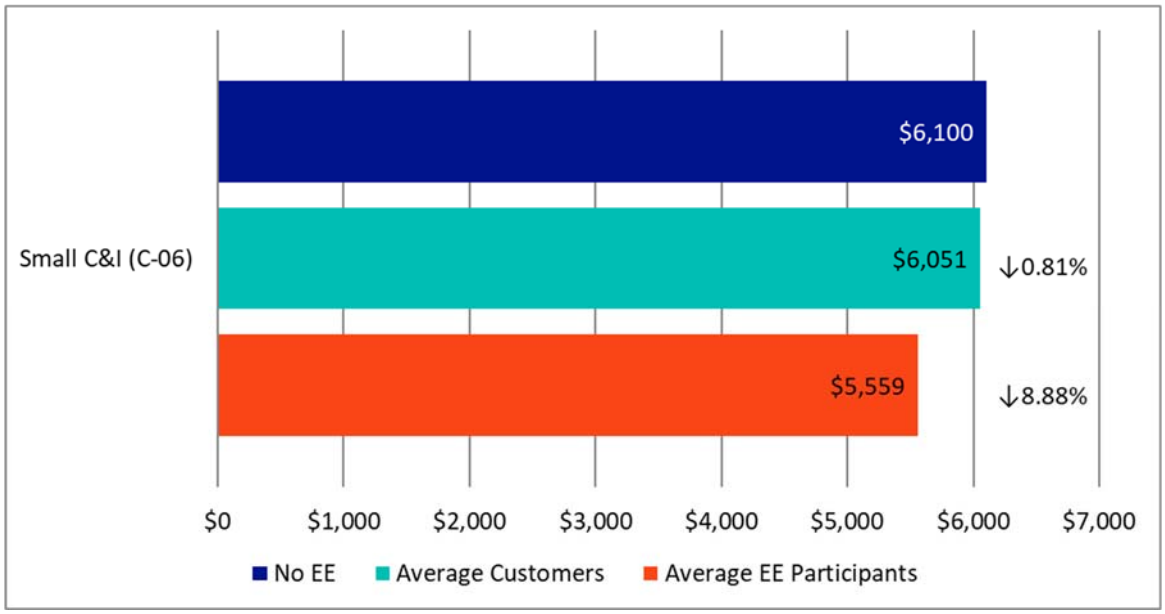


Figure 4. Example of Typical Medium C&I (G-02) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)

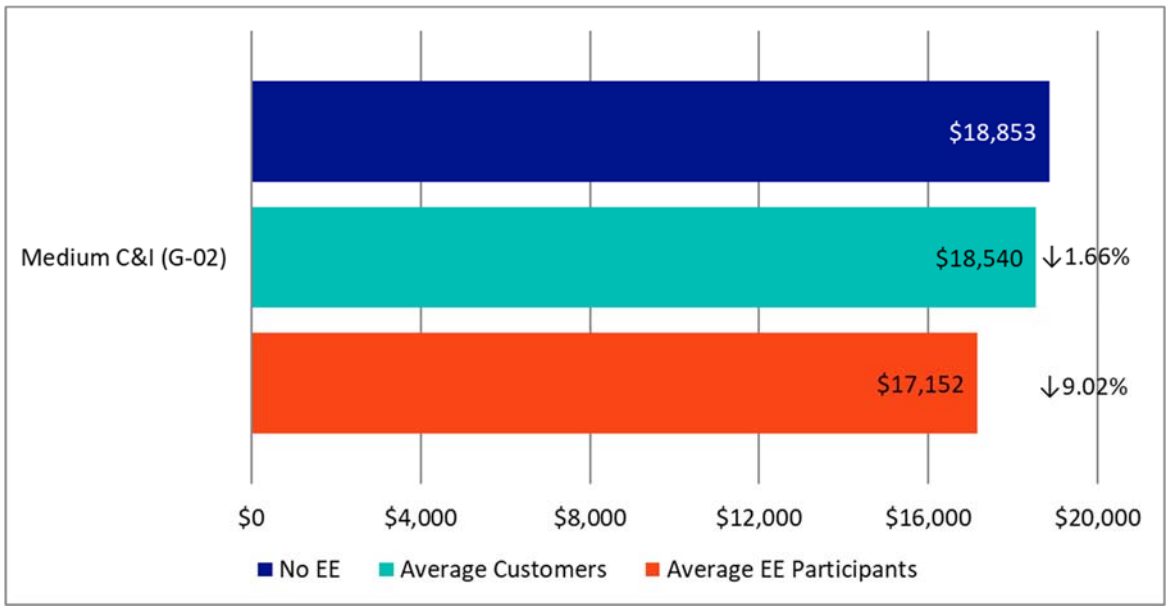
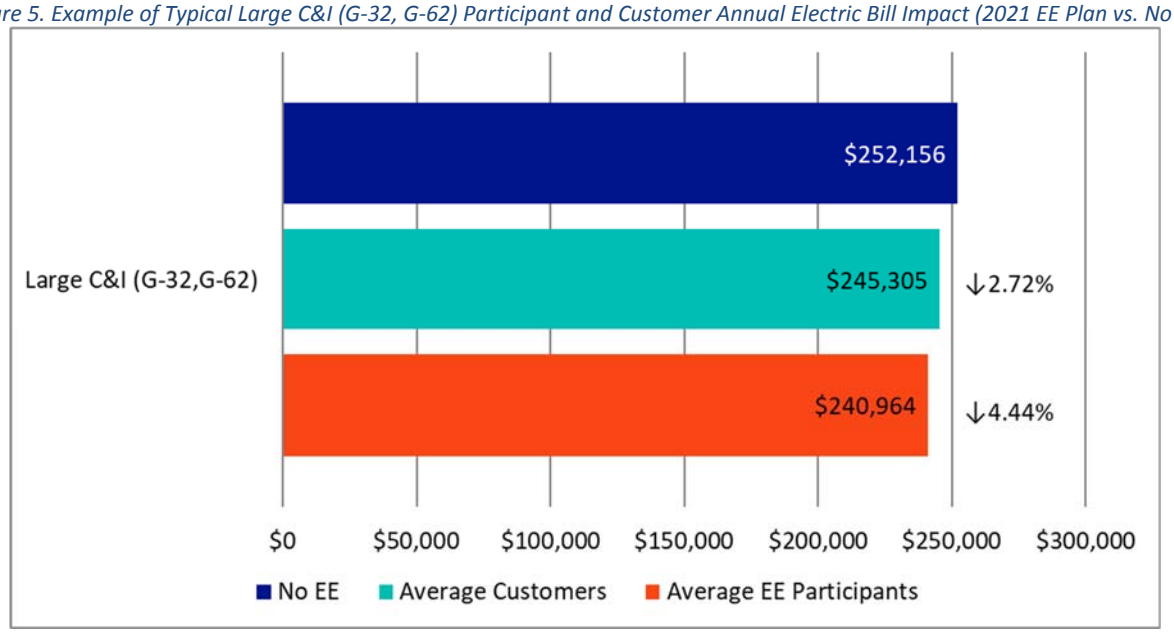


Figure 5. Example of Typical Large C&I (G-32, G-62) Participant and Customer Annual Electric Bill Impact (2021 EE Plan vs. No EE)



4 Gas Bill and Rate Impacts

4.1 Model Background

During the process leading up to the 2020 Annual Energy Efficiency Plan, the Company and stakeholders determined that there was a need for an enhanced methodology to estimate the rate and bill impacts of the natural gas portfolio. In the 2020 plan and in prior years the Company utilized internally-developed methodologies to estimate rate and bill impacts for the gas portfolios. In calendar year 2020, the Company contracted with Synapse Energy Economics ("Synapse") to develop an enhanced model for use in the 2021 Annual Energy Efficiency Plan.

The modeling tool developed by Synapse is designed to analyze long-term rate and bill impacts from energy efficiency programs implemented over a course of three years, or one year. This is an enhancement over prior years' analysis which were more limited in scope. For example, the 2020 analysis included only the first year effects of the energy efficiency charge on rates, and the first year bill impacts due to energy savings generated from efficiency program participation.

The new model used in this plan provides a long term perspective on the impact of one year of gas energy efficiency programs compared to a counterfactual where there is no energy efficiency program in that year. The model considers the upward pressure on rates and bills due to the energy efficiency surcharge in the first year, the upward pressure of lost revenue collection in the first year and future years in which energy efficiency measures create savings, and the downward pressure on rates and bills due to the avoided costs generated by those savings as they persist into the future.

For the analysis presented in this plan and section, the 2021 proposed programs are analyzed. The model assesses four categories of customers. These categories include all the programs offered in the gas portfolio:

- Residential
  - EnergyWise
  - EnergyStar HVAC
  - EnergyWise Multi-family
  - Home Energy Reports
  - Residential New Construction
- Income Eligible
  - Single Family
  - Multi-family
- Small Commercial and Industrial
  - Small Business Direct Install
- Large Commercial and Industrial
  - Commercial New Construction

  - Commercial Retrofit
  - Commercial Multi-family

The model outputs of interest are the forecast changes in rates and the forecast changes in bills due to the proposed energy efficiency investments. The model compares two scenarios: (1) a scenario in which no efficiency resources are implemented over the next three years, and (2) a scenario that reflects the proposed investments in efficiency over the same period.

- *Rate impacts* indicate the extent to which rates change for all customers due to utility energy efficiency programs. This includes upward pressure on rates from program cost and lost revenue recovery, as well as downward pressure on rates from avoided utility system costs.
  - *Long-term rate impacts.* The model includes all avoided costs that might exert downward pressure on rates, as well as any factors that might exert upward pressure on rates. It estimates rate impacts over the long-term to capture the full period over which the efficiency savings occur. The resulting impacts are provided in terms of annual net change in rates in dollars per therm, annual percent change in rates, and long-term net change in levelized rates over a 24 year period.
- *Bill impacts* indicate the extent to which customer bills might be reduced for those customers that participate in efficiency programs and how bills will be impacted for non-participating customers.
  - *Typical bill impacts.* The model calculates average annual bill impacts for program participants, all customers, and non-participants. It considers the long-term rate impacts and energy savings for each program and the four customer types. The resulting bill impacts are shown in terms of levelized long-term average dollar change in bills, net-present value of long-term dollar change in bills, and long-term average percent change in bills.

4.2 Model Inputs

The model takes as input the following categories of information:

- Energy Efficiency program savings: the model takes as input the planned savings for each program in both annual and lifetime savings.
- Participation: National Grid projects participation for each program across each year of the plan.
- Avoided Costs: The model takes as input the avoided cost of natural gas and natural gas demand reduction induced price effect (DRIPE) due to gas energy efficiency.
  - The portion of the natural gas avoided cost that impacts rates is limited to the avoided retail margin costs, and price suppression benefits (Demand Reduction Induced Price Effects or DRIPE

  - The model has the capability to be further refined in the future if other components of avoided costs are quantified and monetized, such as gas transmission and distribution values. Those types of costs are included in the electric bill and rate impact, but are not included in the gas analysis.
- Programmatic Costs: The costs planned for each program are input to the model based on National Grid's budget and benefit cost analysis models. Sector or portfolio levels costs are also included and allocated to customer groupings proportionally to program specific costs.
- Rates: Natural Gas rates for customer classes modeled: residential, income eligible, small commercial and industrial, and large commercial and industrial. The rates are averaged from the prevailing rates on January 1, 2020, May 1, 2020, and September 1, 2020 to capture variability in rates throughout the year.
  - Residential: Rate 12
  - Income eligible: Rate 13
  - Small Commercial and Industrial: Rate 21
  - Large Commercial and Industrial
    - Large C&I: Weighted average of Rates 22,33,23,34,24. Weighted by program participation in the Large C&I programs for 2018-2019.
    - C&I Multi-family: Rate 22
- Customer Count: The latest gas customer counts as of August 31, 2020 by sector are included in the model. These customer counts are escalated out into the future based on projected growth rates.
- Sales Forecast: A sales forecast that omits future natural gas energy efficiency savings is utilized in the model to properly characterize the counterfactual state of the world with no energy efficiency programs.

4.3 Summary of Results

The following subsections summarize the results of the rate and bill impact modeling for each of the four modeled customer segments. The overall results for the 2021 plan at the sector level are presented in the table below with additional detail provided in subsections and figures below. This analysis projects that each modeled customer sector will see a levelized net change in long term rates of between 0.3% and 0.7% due to the 2021 energy efficiency programs. The first year cost of the programs combined with the recovery of lost revenue put upward pressure on rates, while avoided costs as detailed earlier generate downward pressure on rates.

The 2021 gas portfolio will result in long term average bill decreases for program participants in the income eligible, small C&I, and large C&I sectors of between 1.16% and 7.12%.

The residential sector is unique in that it includes the Home Energy Report (HER) program. This behavioral program provides recommendations for residential customers to save energy by taking actions in their home, rather than by installing more-efficient equipment. This results in the program

having a measure life of only one year, as the evaluated results show that behavioral efficiency of this type has relatively short persistence compared to other residential programs that install longer-lived measures. The HER program also reaches nearly all residential customers through either mail or email, meaning that nearly all residential customers are participants.[7]

It is therefore instructive to view the rate and bill impacts for the residential sector in three separate modeling analyses:

1) Results of the HER program in isolation
2) Results of all other residential programs together (EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Residential New Construction)
3) Results with HER and all other residential programs

It is important to note that each of these three parts of the residential sector analysis has been developed using a separate instance of the gas rate and bill impacts model. In the model, the period of time covered by the analysis is determined by the average measure life of the longest included program. Consequently, the model instance analyzing the Home Energy Report program in isolation covers a much shorter period of time than the other two model instances, which means that the three instances are not directly comparable, and the first two model instances do not additively result in the third instance.

Additionally, in the model instance that assesses all programs together, HER participants incur costs associated with the non-HER programs, such as lost revenue recovery. These costs are not captured in the model instance analyzing the Home Energy Report program in isolation.

The HER program in isolation shows essentially no change in bills for participants (-0.01%), average customers (0.00%) or non-participants (0.02%). This is to be expected because the number of participants is high enough that the per-participant savings is less than 1 net MMBtu per participant, resulting in minimal change to bills. Taken at the individual level, the savings results are modest, however in aggregate the HER program generates significant net annual savings by reaching most residential customers and doing so at relatively low cost.

When the remaining four residential programs are assessed together, the results show that participants see an average reduction of 5.29% on their bills over the long term, while average customers see a 0.15% increase, and non-participants see an increase of 0.41%. The EnergyWise, EnergyStar HVAC,

[7] Customers who are not served by the HER program are only excluded due to reasons of evaluability, that is, in order to assess the savings in a statistically valid way, a control group of sufficient size is required.

EnergyWise Multi-family, and Residential New Construction programs have fewer participants than the HERs program, have longer-lived average measure lives (between 17 and 23 years), and generate deeper savings per participant than the HER program, all resulting in deeper bill savings for participants.

Lastly, when all residential programs are modeled together (HER, EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Residential New Construction), the modeling shows a counterintuitive result of participants realizing a slight increase (0.03%) in their long-term bills. This result is a byproduct of the way that the model considers participants for the residential sector when all residential programs are considered together. To calculate impacts for total participants, the model considers the count of participants in the first year, including the large pool of HER participants, through the duration of the modeling period (24 years). The savings for all of the residential programs are therefore spread across a large group of participants and minimizing their impact.

Because of the truly unique nature of the HER program in terms of its measure life, distribution to most customers, and relatively small per-customer savings relative to other residential programs, the Company believes that in the context of this analysis it is also appropriate to consider the results of the HER program in isolation from the remaining four residential programs. Therefore, the residential programs are modeled with three separate modeling instance as shown below.

Table 8. Summary of Rate and Bill Changes due to the 2021 Proposed Natural Gas Energy Efficiency Portfolio

Sector	Levelized net change in rates due to 2021 Programs	Long Term Average Change in Bills		
		Non-Participants	Average Customer	Average Participant
Residential (Model 1: HERs only)	0.0%	0.02%	0.00%	-0.01%
Residential (Model 2: All Programs Except HERs)	0.4%	0.41%	0.15%	-5.29%
Residential (Model 3: All Programs)	0.4%	0.43%	0.15%	0.03%
Income Eligible	0.7%	0.75%	-0.16%	-4.48%
Small C&I	0.3%	0.25%	0.19%	-7.12%
Large C&I	0.4%	0.41%	0.00%	-1.16%

Further detail is provided for each sector in the subsections below.

4.3.1 Residential

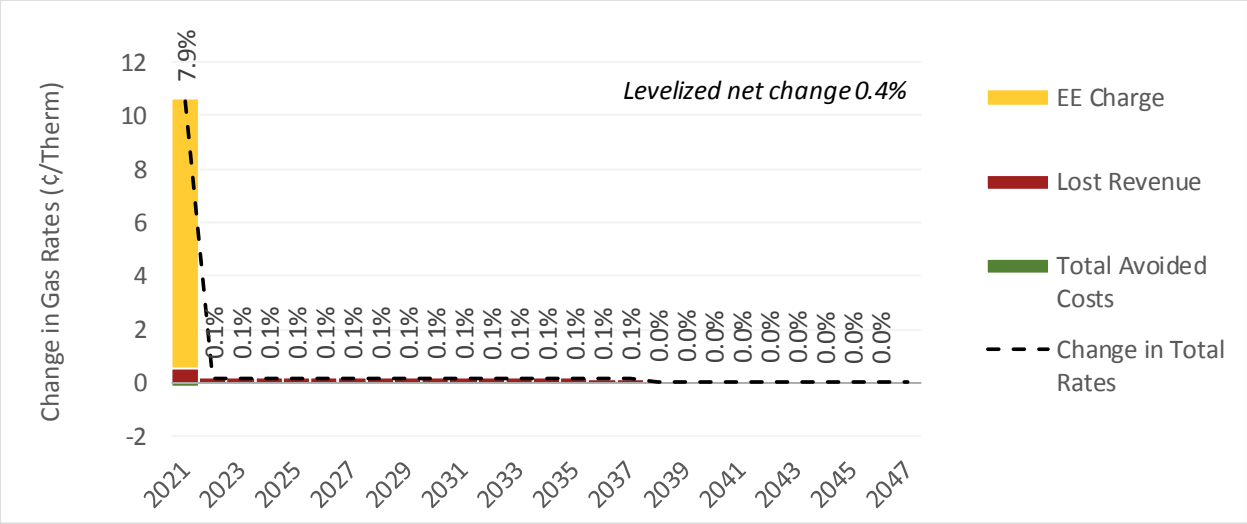
The Income Eligible sector is modeled using rates from rate class 12, Residential Heating. The rate and bill impacts for this sector are modeled for five programs, EnergyWise, EnergyStar HVAC, EnergyWise Multi-family, Home Energy Reports, and Residential New Construction. The residential sector is modeled

using an annual consumption figure of 845 therms per year, of which 699 therms are winter usage and 146 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 209,537 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.1.1 Residential Rates

For the residential sector the 2021 Plan creates a levelized net change in rates of 0.4% (Figure 6) compared to the counterfactual with no energy efficiency.

Figure 6. Change in Rates: Proposed EE vs No EE for the 2021 Plans - Residential



4.3.1.2 Residential Bills

As discussed in the Summary of Results (Section 4.3), the residential programs should be considered in three distinct modeling iterations. First the HER program is assessed in isolation, then the four remaining programs are considered together, and finally all programs are combined in a single analysis. For purposes of characterizing the bill impacts from the residential programs, the results of the first model illustrates that for the HER program in isolation, there is minimal change in long-term average bills, with only a 0.01% reduction for participants. This result is reasonable given the short duration of savings for the HERs program and the small per-participant savings generated by this program.

Figure 7. 2021 Long-Term Levelized Average Change in Annual Bills – Residential, HER Program Only

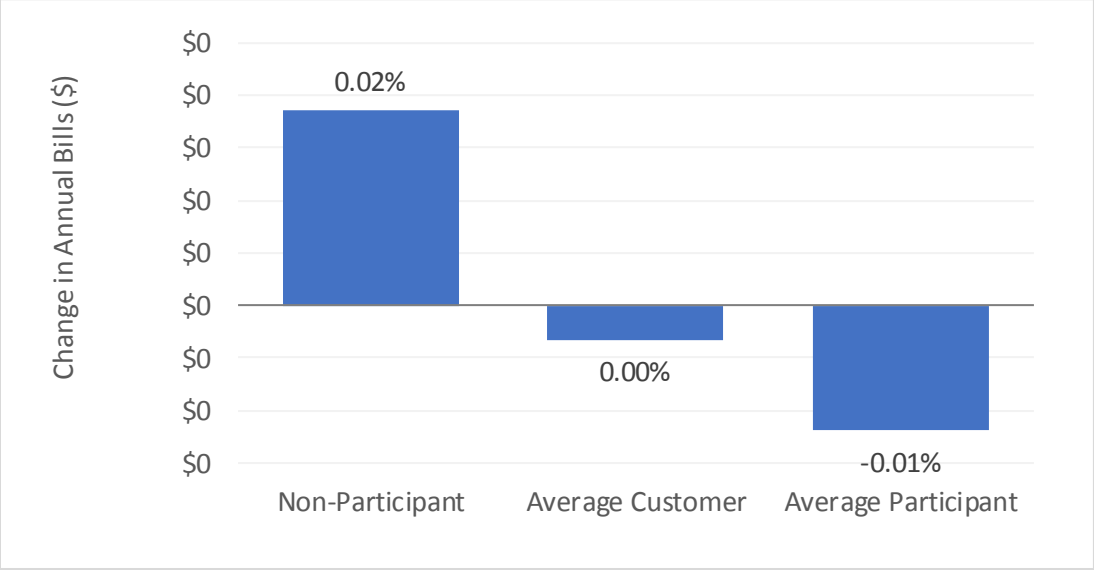
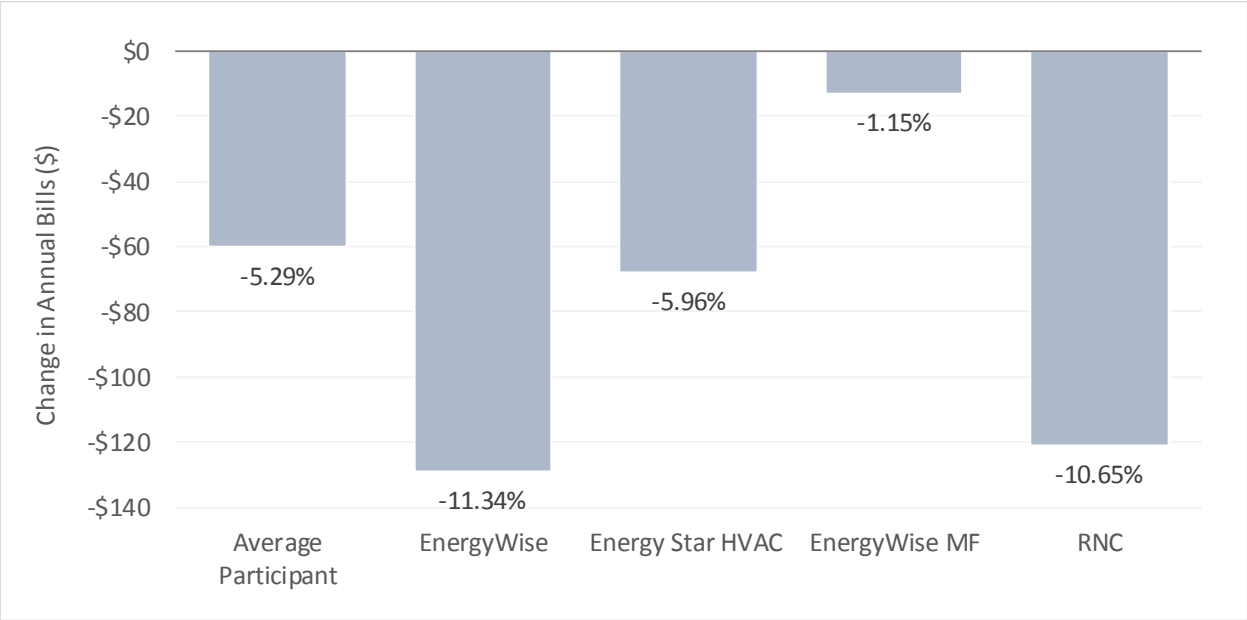


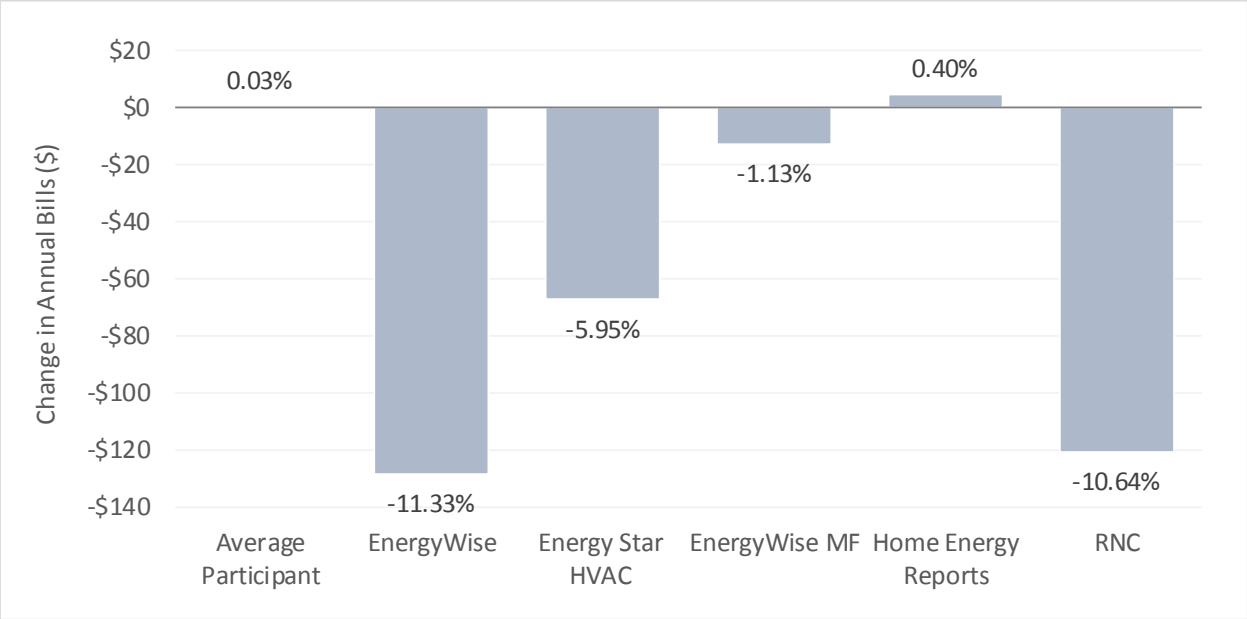
Figure 8 shows the long-term average bill change for program participants in the EnergyWise, Energy Star HVAC, EnergyWise Multi-family, and Residential New Construction programs. The average bill savings range from 1.15% to 11.34% among these programs.

Figure 8. 2021 Long-Term Levelized Average Change in Annual Bills by Program Participants –Residential, HER Excluded



Lastly, Figure 9 shows the impacts for all residential programs together. As discussed previously, these results should not be indicative of a true increase in bills among program participants, but rather result from the combination of the disparate nature of the programs included in this model scenario and how their respective inputs interact in the model.

Figure 9. 2021 Long-Term Levelized Average Change in Annual Bills by Program Participants – All Residential



4.3.2 Income Eligible

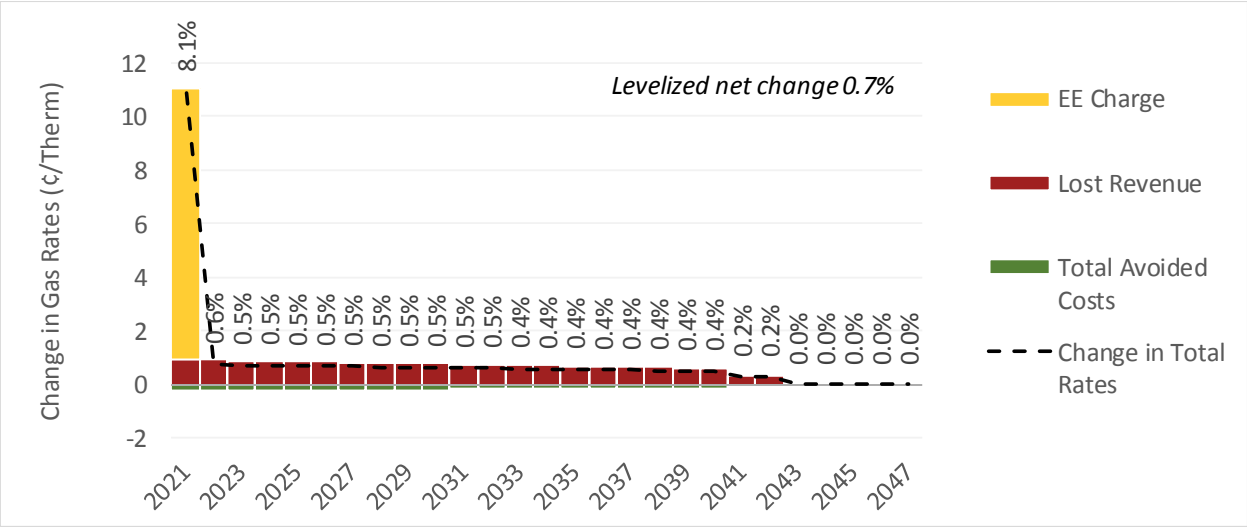
The Income Eligible sector is modeled using rates from rate class 13, low income residential heating. The rate and bill impacts for this sector are modeled for two primary programs, the income eligible single family and income eligible multifamily programs. Income eligible customers also participate in the home energy reports program that is modeled as part of the residential sector in this analysis. The income eligible sector is modeled using an annual consumption figure of 841 therms per year, of which 690 therms are winter usage and 151 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 20,703 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.2.1 Income Eligible Rates

The 2021 programs addressing the income eligible market are projected to result in a 0.7% levelized increase in rates for the income eligible sector (Figure 10). Compared to the residential sector, which has similar usage as the income eligible sector, the relative impact to rates is larger for this customer group partially because the energy efficiency charge represents a larger portion of the overall per-therm cost

because distribution adjustment charges (DAC) are lower for income eligible customers than residential customers.

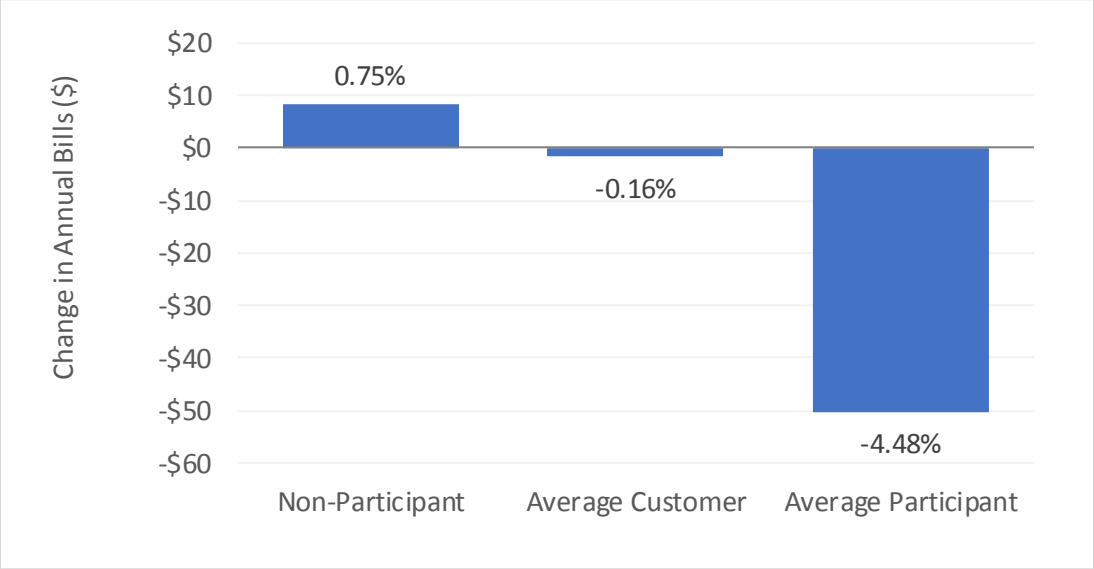
Figure 10. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Income Eligible



4.3.2.2 Income eligible Bills

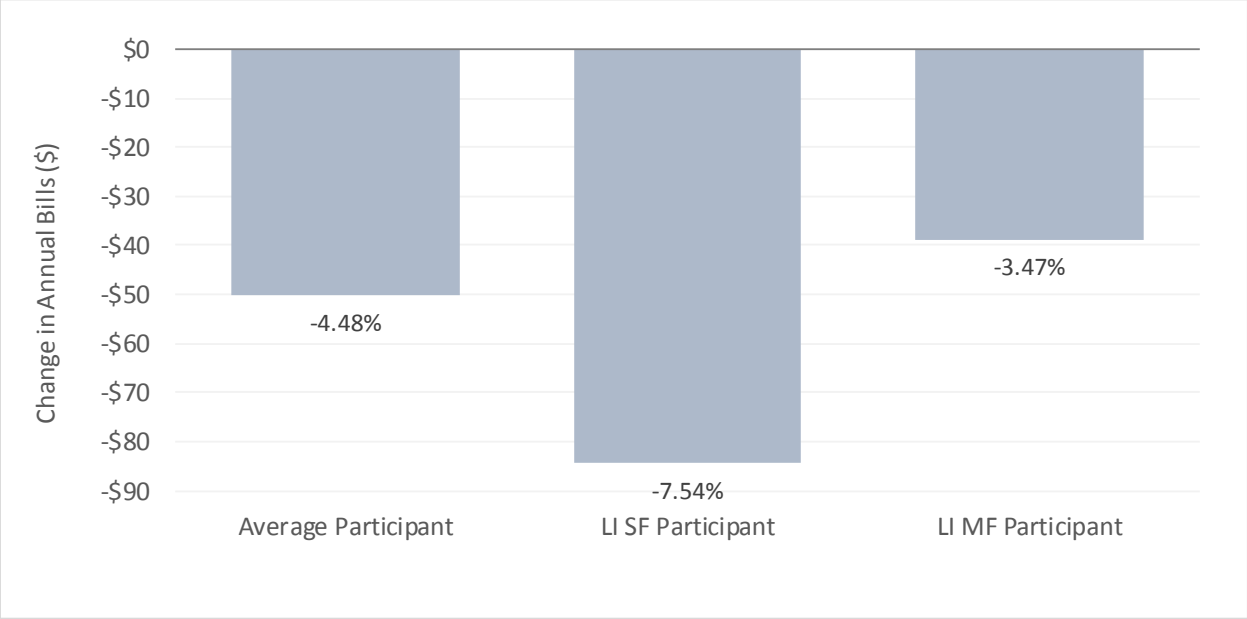
The income eligible programs planned in the 2021 plan will result in a long-term average reduction in bills for participating customers of 4.48% on average. Average customers will see a 0.16% reduction in annual bills and non-participants will see a 0.75% increase in bills.

Figure 11. Long-Term Average Change in Annual Bills for the 2021 Plan– Income eligible Customer Group



Analyzing each program individually, participants in the single family income eligible program will see an average of 7.54% reduction in annual bills due to their 2021 participation, while multi-family income eligible participants will see an average 3.47% reduction in annual bills over the long-term.

Figure 12. Long-Term Average Change in Annual Bills for the 2021 Plan– Income eligible participant impacts by program



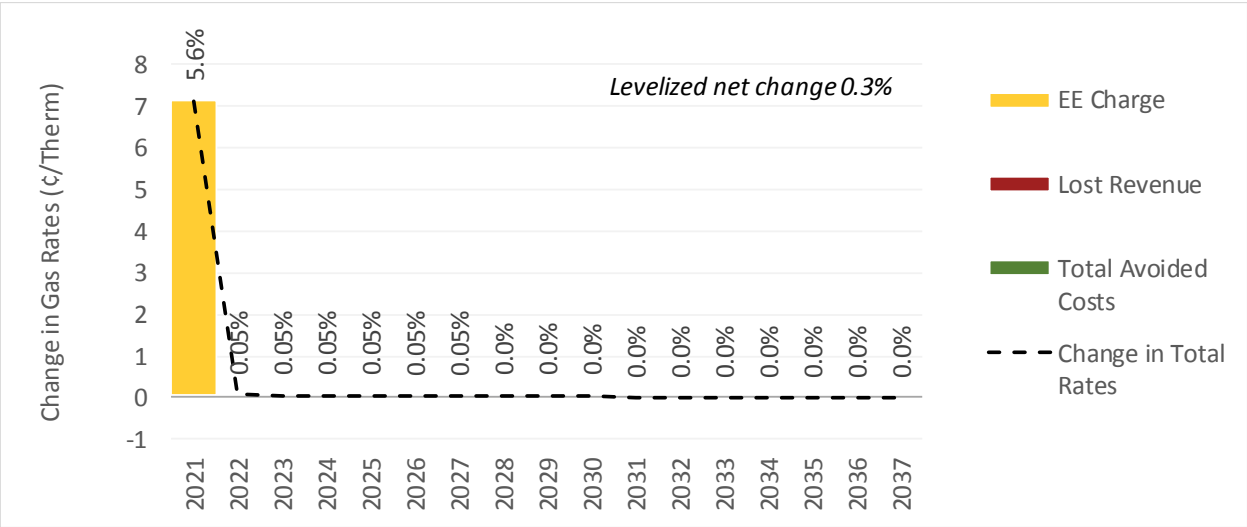
4.3.3 Small Commercial and Industrial

The Small Commercial and Industrial sector is modeled using rates from rate class 21, Small (< 5,000/yr). The rate and bill impacts for this sector are modeled for the Small Business Direct Install program. The Small Commercial and Industrial sector is modeled using an annual consumption figure of 1,270 therms per year, of which 1,062 therms are winter usage and 208 therms are summer usage determined by dividing sales for the sector by meter counts. The customer population is modeled using latest customer counts as of August 2020, 19,063 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020.

4.3.3.1 Small Commercial and Industrial Rates

The 2021 program addressing the small C&I market are projected to result in a 0.3% levelized increase in rates for the commercial and industrial sector (Figure 13).

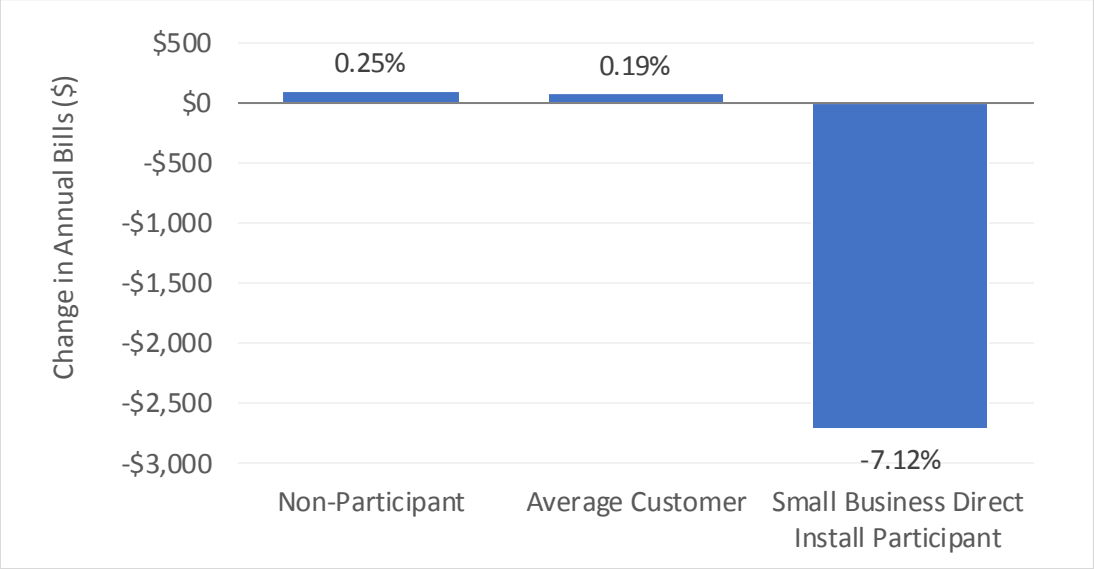
Figure 13. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Small Commercial and Industrial



4.3.3.2 Small Commercial and Industrial Bills

The Small Commercial and Industrial program will result in an average annual bill reduction of 7.12% for participants in the Small Business Direct Install program (Figure 14).

Figure 14. Long-Term Average Change in Annual Bills for the 2021 Plan– Small Commercial and Industrial



4.3.4 Large Commercial and Industrial

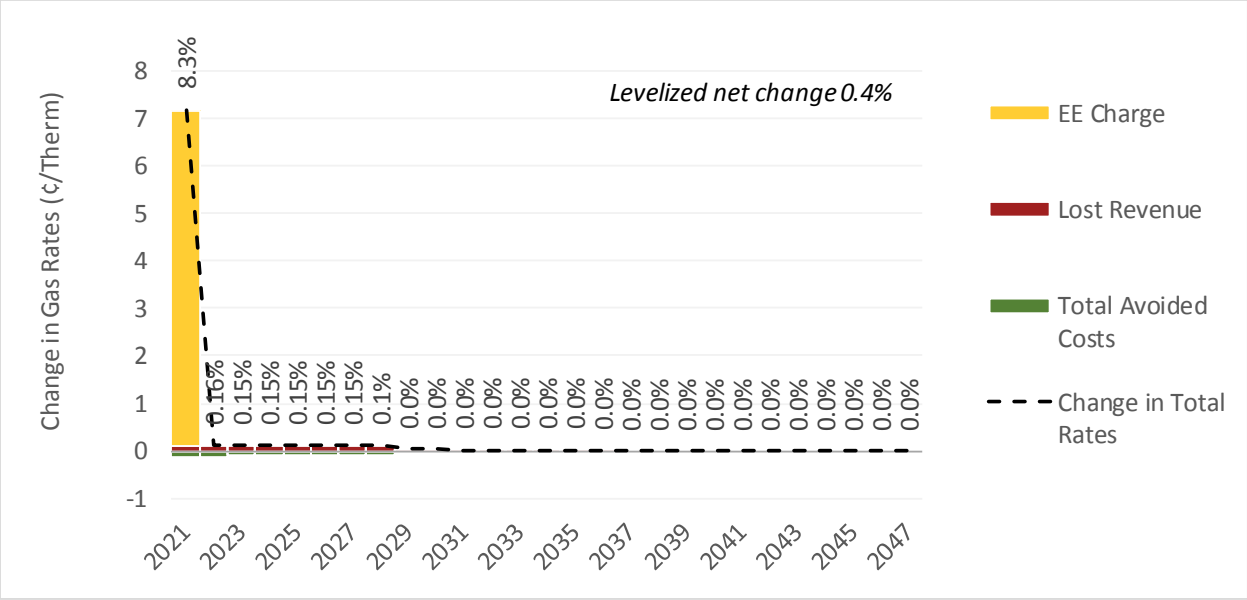
The Large Commercial and Industrial sector is modeled using rates from rate classes 22,33,23,34,24. The rate and bill impacts for this sector are modeled for the Commercial New Construction, Commercial

Retrofit, and Commercial Multi-family programs. The customer population is modeled using latest customer counts as of August 2020, 5,910 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2020. Consumption among participants is modeled using usage observed among the large C&I program participants in the 2018 and 2019 programs and for the medium C&I class for C&I multifamily participants.

4.3.4.1 Large Commercial and Industrial Rates

The 2021 programs addressing the large C&I market are projected to result in a 0.4% levelized increase in rates for the commercial and industrial sector.

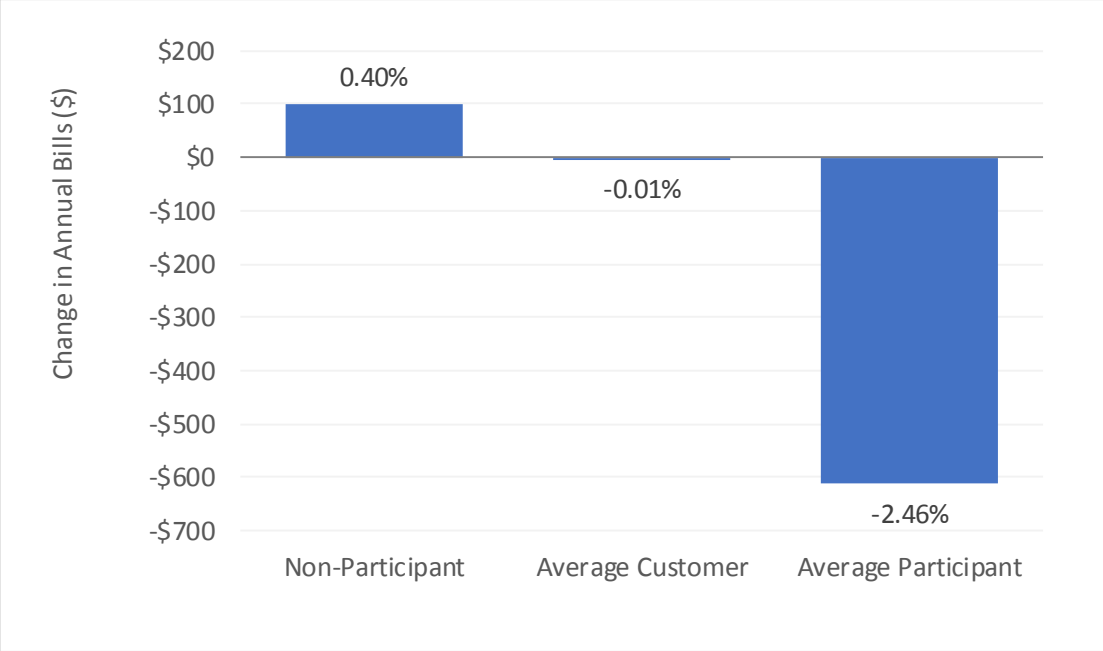
Figure 15. Change in Rates: Proposed EE vs No EE for the 2021 Plan – Large Commercial and Industrial



4.3.4.2 Large Commercial and Industrial Bills

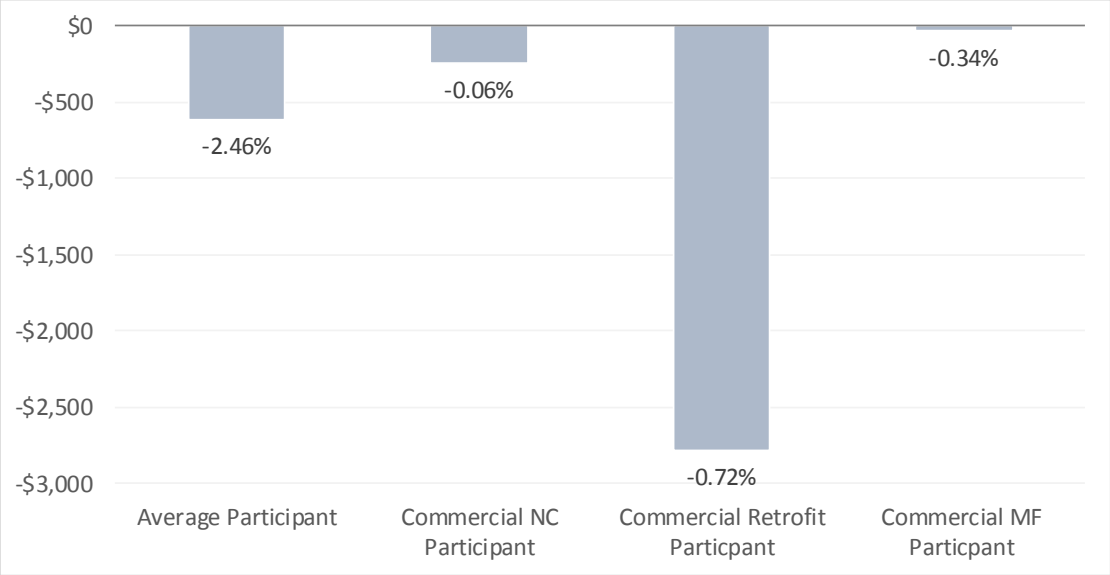
The large commercial and industrial programs will result in an average annual bill reduction of 1.16% for participants.

Figure 16. Long-Term Average Change in Annual Bills for the 2021 Plan– Large Commercial and Industrial Group



Analyzing each program individually, commercial retrofit participants will see a reduction of 0.72%, while participants in the commercial new construction program and the commercial multi-family programs will see smaller changes in their bills with changes of -0.06% and 0.34%, respectively.

Figure 17. Long-Term Average Change in Annual Bills for the 2021 Plan– Large Commercial and Industrial impacts by program



4.4 Discussion and Interpretation of Natural Gas Results

While this analysis indicates that for the proposed natural gas efficiency investments there is slight upward movement of rates, as with most customer segments in the electric portfolio, the results should not be viewed in isolation and are one component that the Company considers in its proposed energy efficiency plan. For each customer segment the modeling shows reductions in long-term bills due to customer participation in the programs. In addition to the rate and bill impacts, the Company considers both the benefit cost results and the cost of supply in developing its proposal. The portfolio of programs is highly cost effective per the RI Test analysis and less than the cost of supply. The 2021 gas portfolio overall has a BC ratio of 3.0 under the RI Test and cost of supply analysis shows that the cost of energy efficiency is $14.2 Million less than the cost of alternative gas supply.

Note that the RBI model excludes several key benefits of energy efficiency. For example, the price of carbon is not fully accounted for in National Grid's natural gas rates. Efficiency programs reduce carbon and other greenhouse gas emissions, which is not accounted in this model but is accounted for in the BCA as a non-embedded benefit. Likewise, the gas efficiency programs create non-energy benefits that are not accounted for in this model but are included in the BCA.

As noted earlier, a key distinction between the gas model and the related electric model is the limited set of gas avoided costs. The portion of the natural gas avoided cost that impacts rates is limited to the avoided retail margin costs, and price suppression benefits (Demand Reduction Induced Price Effects or "DRIPE"). In contrast, in the electric model there are embedded RGGI costs in rates and the electric model also accounts for T&D avoided costs. The gas model has the capability to incorporate a T&D avoided cost in the future should one be developed through the AESC 2021 study, but it is not currently accounted for in the calculation of long term rates in the present analysis.

The Company will reassess the inputs and assumptions in this analysis for each subsequent annual efficiency plan filing and make updates to the analysis and model as appropriate to continue to incorporate latest information and understanding of the impacts of the gas programs on long-term energy costs and customer bills.

Attachment 8

2021 Pilots, Demonstrations and Assessments

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1. Introduction

The Company invests in pilots, demonstrations and assessments to research and develop new measures, solutions and programs to expand energy efficiency choices and benefits to customers. The Company continues to test new measures and solutions that were proposed in the 2020 Annual Plan and has proposed additional demonstrations and assessments for the 2021 Annual Plan. In 2019, as part of its commitment to innovation, the Company launched the new Customer Energy Management (CEM) Growth and Development team. This team has developed a new framework to assess and test new innovations for the energy efficiency and active demand response portfolios. This team will accelerate the process of developing and implementing pilots, demonstrations and assessments for the Company, resulting in new measures, solutions, and offerings for customers.

Process: The Company has developed a standard process by which it tests all new ideas and determines if the idea merits a pilots, demonstration, or assessment. Each idea is first assessed in the **Intake** stage to determine if the solution can be offered through the energy efficiency or demand reduction programs and if it is commercially available. The application of the idea, target customers, context of existing programs and offerings, initial identification of market barriers that the idea addresses or faces, and preliminary savings potential are developed in the **Concept** stage. Ideas in these two early stages of review make up the Innovation Pipeline of ideas that is continually moving as new ideas are examined and promising ideas are further vetted and launched into the portfolio.

The Concept stage necessitates preliminary research and analysis of the product, which will inform the **Plan** stage. Key decisions of how to progress with the solution are made during the Plan stage, including if a pilot, demonstration, or assessment is required to develop the idea and, if so, whether an independent or vendor evaluation approach should be taken. The new ideas included in section 4 are all in the plan stage of development and recommended for a pilot, demonstration, or assessment beginning in 2021. The decisions around what type and rigor of testing required for each item will be made with input from the National Grid Evaluation Measurement & Verification (EM&V) team, EERMC Consultants, and OER.

The planned pilot, demonstration, or assessment will be executed in the **Develop or Demonstrate** stage. Updates will be provided to the stakeholder teams on a quarterly basis.

Once the develop or demonstration stage is complete, the offering will be finalized and launched through the **Qualify**, **Launch**, and **Maximize** stages. During these stages, the product

will be handed off to the CEM, vendor, and implementation teams who will manage the product as part of the Company's energy efficiency portfolio.

During any of the above stages it is possible for the idea to **Exit** the process. The product may be **Retired** if it does not fit into our programs or if there is no viable business case. The product may be **Parked** if the policy or infrastructure required for the idea to be successfully delivered to customers is not available, but may be in the near term. Finally, the product may be **Referred** directly to the programs if the idea is expected to produce reliable savings, fits readily into an existing program or measure, and the receiving program has the capability to finalize savings and incentives.

Intake	Determine the fit and feasibility of a new idea in existing programs. Is the solution ready to be offered to customers and is it appropriate for existing programs?
Concept	Define the offering. What customer problems does this solution address? What are the preliminary savings and potential? What market barriers does this idea face or address?
Plan	Define the business case for inclusion in programs. Determine the level of due diligence required to bring the solution into the program with input from EM&V.
Develop or Demonstrate	Execute research and testing of solution to the appropriate level of rigor. Provide firm savings estimates for the product.
Qualify	Finalize the product offering, including savings and incentive levels.
Launch	Offer the product within existing programs.
Maximize	Scale the product to maximize program activity.
Exit	At any point a product may be retired, parked, or referred to an exisitng program.

Innovation Pipeline: The process outlined above is designed to bring in as many ideas as possible and quickly determine to what extent the Company should invest resources in developing the idea. The pilots, demonstrations, and assessments discussed here have already been identified as ideas that should be further explored and tested, but it's possible that

additional ideas from the Innovation Pipeline will emerge for additional, immediate analysis through 2021. To ensure those emerging ideas can be quickly and efficiently vetted, the Company has set aside budget to assess approximately two ideas in each sector. Promising ideas may progress to a demonstration or as a program measure in the following year.

Evaluation: It is to be expected that each idea passing through this process will have a different set of requirements and research questions that must be answered prior to qualification and inclusion in programs. Depending on the characteristics of the idea, the expected program delivery pathway, and the nature of the uncertainty around the idea, the Company plans for different approaches to evaluate the idea during a pilot, demonstration, or assessment. For example, a low touch residential product that we expect to deliver through an upstream program requires a very different analysis than a high touch industrial measure with few potential customers across the state.

The Customer Energy Management Growth and Development team will recommend a research plan for each pilot, demonstration, or assessment approved through the planning process. The team will solicit input from the Company's EM&V team, OER, and EERMC consultants on whether the research requirements can be best met through an independent evaluation, a vendor evaluation, or an internal review. These approaches are further discussed in the next section.

2. Definitions

The Company, using guidance from the PUC, has outlined three separate pathways that may be used to assess ideas in the Innovation Pipeline: Pilot, Demonstration, or Assessment. It is assumed that any idea selected for a Pilot Demonstration, or Assessment has been vetted through the Intake and Concept stages outlined above. Ideas are vetted for fit and feasibility, commercial availability, and documented preliminary recommendations of characteristics like target customer, market barriers, magnitude of potential savings, and delivery pathway. A pipeline idea will only be recommended as a pilot, demonstration, or assessment if there are clearly articulated research goals that cannot be answered without a concerted research effort.

The Company has three research pathways that can be applied during a pilot, demonstration, or assessment: Independent Evaluation (highest rigor), Vendor Evaluation, or Internal Review (lowest rigor). The research pathway will be chosen depending on the needs and potential of a Pilot, Demonstration, or Assessment.

Table 1. Definitions: Pilots, Demonstrations and Assessments			
	Pilot	Demonstration	Assessment
Defining Characteristics	• May result in independent program • Long term and comprehensive engagement required to test and develop offering • Market capabilities may need to be developed	• Technology requires information gathering and field installations	• Technology addresses program need that can't be met with other, more certain solutions • Technology does not have a robust basis for energy savings
Cost effective savings information	Unknown or limited	Estimated savings	Unknown or limited
Evaluation Options*	Vendor or Independent	Vendor or Independent	Vendor, Independent, or Internal Review
Savings contribution to shareholder incentive	No	Yes	No
Cost recovery from SBC	Yes	Yes	Yes

* Each evaluation option will include input from EERMC and OER. Evaluation option selection based on factors such as uncertainty of savings, scope of offering, and whether technology is considered a pilot, demonstration, or assessment

Pilots

In 2019, the Company redefined what it considers a pilot in accordance with the Docket No. 4600-A PUC Guidance Document.

Pilot definition: As defined in the Docket 4600-A Guidance Document, “A pilot is a small scale, targeted program that is limited in scope, time, and spending and is designed to test the feasibility of a future program or rate design. It is incumbent upon the proponent of a pilot to

define these limits in a proposal for PUC review. Ideally, a pilot can provide net benefits and achieve goals, but the primary design and value of a pilot is to test rather than to achieve."[1]

This attachment summarizes each pilot and describes the way it advances, detracts, or remains neutral on achieving the Docket 4600 goals for the electric and gas system.

Pilots are designed to explore technologies and approaches to energy management not included in the core energy efficiency programs (Residential, Commercial and Industrial, and Multifamily) and that could potentially become a new, standalone program.

Pilots enable the Company to test technologies, new energy management strategies, customer adoption, workforce adoption, and cost effectiveness of emerging and new technologies. While pilots are designed to test standalone programs, pilot results may conclude that a standalone program is not recommended or that certain aspects of the pilot should be offered within existing programs. It is likely that pilots will require a long term commitment and broader set of stakeholder input, given the scope of adding a new core program to the Company portfolio. Savings associated with Pilots will not contribute to shareholder incentives. Pilots may be evaluated with either an independent or a vendor evaluation.

Pilots are likely to be recommended when:

- Solution meets fit and feasibility criteria of the Intake stage
- Solution is well defined in the Concept stage, including estimate of savings and potential
- Solution is unique and robust enough to operate as a standalone program
- Long term and comprehensive engagement required to determine the benefits and structure of a potential standalone program
- Market capabilities may need to be built before the program can be successful

For actions in this Plan that do not fall under the Docket 4600-A definition of pilots, the Company proposes the following definitions for demonstrations and assessments:

Demonstrations

Where a pilot will test the feasibility of a new program outside of the existing core programs, a demonstration will test the feasibility of a new product or offering for inclusion in existing programs. It is generally expected that demonstrations will be less time and resource intensive than pilots, since generally there is greater certainty around a narrow, incremental idea added to a program rather than a totally new set of offerings. Savings associated with demonstration

[1] Docket No. 4600-A PUC Guidance Document, October 27, 2017. Section V. Pilots.

projects may contribute to shareholder incentives. Demonstrations may be evaluated with either an independent or a vendor evaluation.

Demonstrations are likely to be recommended when:

- Solution meets fit and feasibility criteria of the Intake stage
- Solution is well defined in the Concept stage, including estimate of savings and potential
- Expected that the solution requires information-gathering and field installations
- Solution has a robust basis for energy savings

Assessments

Assessments will be deployed for solutions that address a particular gap or program need, but have significant uncertainty around the effectiveness or potential of the solution to realize savings. Because of the uncertainty, assessments will not include field demonstrations or customer installations. Instead, assessments will focus on information gathering to equip Company staff to make a more informed decision of whether and how to proceed with the idea. It is possible that an assessment could recommend further demonstration of the idea or determine the solution should exit the review process. Savings associated with assessments may not contribute to shareholder incentives. Assessments may be evaluated with an independent evaluation, vendor evaluation, or internal review.

Assessments are likely to be recommended when:

- Solution may have questions of fit and feasibility in the Intake stage
- Solution addresses a program need that can't be met with other, more certain options
- Solution does not have a robust basis for energy savings

Evaluation Pathways

Three evaluation pathways are available to determine the appropriateness of a particular solution for inclusion in the programs. The evaluation approach will be determined based on considerations such as the uncertainty of the savings, scope of the offering, market barriers, and whether the technology is considered under a pilot, demonstration, or assessment.

Independent evaluations will apply the greatest level of rigor to the pilot, demonstration, or assessment and will require broad coordination between teams. The CEM Growth and Development team will participate in the planning and review process, but the evaluation itself is subject to the procurement process, oversight, and methods outlined in Attachment 3. The third-party evaluator will develop the evaluation plan prior to customer installations to ensure the number and condition of customer installations are appropriately rigorous. The third-party evaluator may not necessarily perform customer installations, but they will be involved to the

extent required to ensure appropriate metering and customer feedback needed for the final analysis.

An independent evaluation is likely to be recommended if:

- Solution is expected to contribute significant savings towards program savings goals
- The pilot, demonstration, or assessment analysis must consider population level analysis, as opposed to site specific analysis, to answer research questions
- There are policy or baseline questions that should be addressed through the evaluation framework

Vendor evaluations will be managed by the CEM Growth and Development team from beginning to end with a single vendor completing all tasks of the evaluation. Vendor evaluations may be applied to a pilot, demonstration, or assessment. This evaluation pathway will engage a vendor to provide initial research on market readiness, market barriers, customer interest, and work in other territories, before they assess, install, and analyze the results of the technology. The vendor must not have a financial interest in the outcome of the pilot, demonstration, or assessment and must have the necessary engineering, research, or M&V experience to evaluate the idea in an unbiased manner. The vendor will provide recommendations for including the technology in the programs and key information to inform deployment of the offering such as target customers, market barriers, savings methodology, and best practices for installations and commissioning. The key differences between a vendor evaluator and independent evaluator related to oversight, since the independent evaluator is subject to the RI EM&V, and vendor procurement, since independent evaluators are subject to procurement processes in Attachment 3.

A vendor evaluation is likely to be recommended if:

- Solution will not contribute significant savings towards program savings either because it has a niche application or the savings are relatively small
- Solution is expected to be delivered through a custom pathway with site specific information inputs available during program delivery

Finally, an **Internal review** may use internal resources, primarily the CEM Growth and Development team, to explore a product through an Assessment. Internal reviews will not be applied to pilots, which require external capabilities, or demonstrations, which must maintain the integrity of the savings that may contribute to the shareholder incentive. An internal review will focus on key questions of uncertainty or policy related to the technology. The internal review can draw on available external resources and data, but will perform the research, analysis, and recommendations internally.

An internal review is likely to be recommended if:

- Solution is examined as an Assessment
- Research questions can be answered without customer installations
- Research can be delivered with internal resources and external resources that already available without procurement processes (such as ESource)

3. Summary of Commercial, Industrial and Residential Pilots, Demonstrations and Assessments

The following pilots' demonstrations and assessments are proposed for 2021 in the Commercial, Industrial, and Residential sectors. Savings estimates are approximate and only include primary fuel savings for the target customer population.

Table 2. Electric Commercial and Industrial Demonstrations and Assessments

Classification	Fuel	Name	C&I Programs	Duration	Budget*	Savings Estimation	Evaluation
Demonstrations							
Industrial	Dual	Continuous Energy Improvement (CEI)	C&I Retrofit	2018-2021	$ 380,800	900 MWh (projected for 2021)	Vendor
Lighting	Dual	Network Lighting Controls Plus HVAC (NLC+)	C&I Retrofit	2020-2021	$ 130,252	1.44 kWh/SF	Vendor
HVAC	Dual	Kitchen Exhaust	C&I Retrofit	2020-2021	$ 66,292	27 MWh (potential)	Vendor
	Dual	Smart Valves	C&I Retrofit	2021	$ 177,750	300 MWh (projected for 2021)	Vendor
	Elec.	Enzyme-based HVAC Coil Cleaning	C&I Retrofit	2021	$ 85,538	6-10% of HVAC consumption	Vendor
Innovation Pipeline**	Elec.	Innovative Electric	Allocated	2020	$ 32,401	To be estimated	To be determined
Assessments							
Laundry	Dual	Shared Laundry Facility Clothes Washers and Dryers	C&I New Construct-ion	2021	$ 6,480	Unknown	Internal Review
General	Dual	Use of Submetering to Support EE Opportunities	C&I Retrofit	2021	$ 25,921	Unknown	Internal Review
Refrigeration	Elec.	Refrigerant Leak Survey and Repair	C&I Retrofit	2021	$ 25,921	Unknown	Internal Review
HVAC	Elec.	HVAC Automation for Demand Response	C&I New Construct-ion	2021	$ 25,921	Unknown	Internal Review
Total Electric C&I Demonstration					**$ 873,033**		
Total Electric C&I Assessments					**$ 84,242**		

Note:
*Budgets indicated in this table include, evaluation, incentives, program administration, sales, marketing, technical assistance and training (if applicable). Pilots and Assessments budgets are not included in Performance Incentive calculations.
** Innovation budgets are for demonstrations that present opportunities during the plan term. Budget and savings estimates will be developed when the demonstrations are identified.

Table 3. Gas Commercial and Industrial Pilots, Demonstrations and Assessments

Classification	Fuel	Name	C&I Programs	Duration	Budget*	Savings Estimation	Evaluation
Pilot							
Active Demand Response	Gas	Gas Demand Response Pilot	N/A	2021	$ 215,780	27,280 Therms (projected for 2021)	Vendor
Demonstrations							
Industrial	Dual	Continuous Energy Improvement (CEI)	C&I Retrofit	2018-2021	$ 179,200	75,000 Therms (projected for 2021)	Vendor
HVAC	Dual	Network Lighting Controls Plus HVAC (NLC+)	C&I Retrofit	2020-2021	$ 64,154	0.012 Therms/sqft	Vendor
	Dual	Smart Valves	C&I Retrofit	2021	$ 59,250	23,000 Therms (projected for 2021)	Vendor
	Dual	Kitchen Exhaust	C&I Retrofit	2020-2021	$ 134,593	67,000 Therms (potential)	Vendor
	Gas	Gas Heat Pumps	C&I New Construct-ion	2022-2022	$ 233,287	15,000-20,000 Therms (for a 400-600 mbh unit)	Vendor
Innovation Pipeline**	Gas	Innovative Gas	Allocated	2021	$ 32,401	To be estimated	To be determined
Assessments							
Laundry	Dual	Shared Laundry Facility Clothes Washers and Dryers	C&I New Construct-ion	2021	$ 19,441	Unknown	Internal Review
General	Dual	Use of Submetering to Support EE Opportunities	C&I Retrofit	2021	$ 25,921	Unknown	Internal Review
Total Gas C&I Pilots					**$ 215,780**		
Total Gas C&I Demonstrations					**$ 702,885**		
Total Gas C&I Assessments					**$ 45,361**		

Note:
*Budgets indicated in this table include, evaluation, incentives, program administration, sales, marketing, technical assistance and training (if applicable). Pilots and Assessments budgets are not included in Performance Incentive calculations.
** Innovation budgets are for demonstrations that present opportunities during the plan term. Budget and savings estimates will be developed when the demonstrations are identified.

Table 4. Electric Residential Demonstrations and Assessments							
Classification	**Fuel**	**Name**	**Residential Program**	**Duration**	**Budget***	**Savings Estimation**	**Evaluation**
Demonstration							
HVAC	Dual	New Air Sealing and Insulation Products	EnergyWise	2021-2022	$ 25,921	0.05 kWh/sqft	Vendor
Demand Response	Elec.	Solar Inverter Direct Load Control	Residential Demand Response	2021-2023	$ 254,570	102.5 kWh/ inverter	Independent
****Innovation Pipeline**	Elec.	Innovation Electric	Allocated	2020	$ 32,401	To be estimated	To be determined
Assessments							
Whole Building	Elec.	Pre-Fab Whole House Energy Refurbishment	RNC	2021	$ 6,480	Unknown	Internal Review
Total Electric Residential Demonstration					**$ 312,892**		
Total Electric Residential Assessments					**$ 6,480**		

Note:
*Budgets indicated in this table include, evaluation, incentives, program administration, sales, marketing, technical assistance and training (if applicable). Pilots and Assessments budgets are not included in Performance Incentive calculations.
** Innovation budgets are for demonstrations that present opportunities during the plan term. Budget and savings estimates will be developed when the demonstrations are identified.

Table 5. Gas Residential Demonstrations and Assessments							
Classification	**Fuel**	**Name**	**Residential Program**	**Duration**	**Budget***	**Savings Estimation**	**Evaluation**
Demonstrations							
HVAC	Dual	New Air Sealing and Insulation Products	EnergyWise	2021-2022	$ 77,762	0.1 Therm/sqft	Vendor
	Gas	Gas Heat Pumps	HVAC	2021-2022	$201,445	250 Therms/unit	Independent
Innovation Pipeline**	Gas	Innovation Gas	Allocated	2021	$ 32,401	To be estimated	Independent
Assessments							
Whole Building	Dual	Pre-Fab Whole House Energy Refurbishment	RNC	2021	$ 19,441	Unknown	Internal Review
Total Gas Residential Demonstration					**$311,608**		
Total Gas Residential Assessments					**$ 19,441**		

Note:
*Budgets indicated in this table include, evaluation, incentives, program administration, sales, marketing, technical assistance and training (if applicable). Pilots and Assessments budgets are not included in Performance Incentive calculations.
** Innovation budgets are for demonstrations that present opportunities during the plan term. Budget and savings estimates will be developed when the demonstrations are identified.

4. Commercial and Industrial Pilots, Demonstrations and Assessments

4.1 Commercial and Industrial Pilots

a. Gas Demand Response

Pilot Stage: Develop of Demonstrate

Innovation Overview: The Company has been utilizing electric Demand Response (DR) to address grid constraints and help provide reliable service to our customers for a number of years. During the winter of 2018/19, the Company launched a Peak Period Gas Demand Response (PPDR) pilot offering, which incentivizes customers to shift their usage outside of the peak-period of the gas system (6AM-9AM from November 1st to March 31st). This pilot targeted commercial and industrial customers who have intra-day flexibility of their natural gas usage. Customers in this pilot would be able to provide their demand reduction via either fuel-switching or demand control (e.g. thermostat setback). In 2019/20, the company added the Expanded Demand Response (EDR) offering, which targeted large customers that could achieve 24 hour gas reductions, primarily with back-up heating. At the close of the 2019/20 season, the company had two participants in the PPDR pilot offering and two in the EDR pilot offering.

With gas DR, the Company will test distribution system benefits, reduction of gas system peak demand via a reduction in overall natural gas consumption, customer adoption of gas DR and incentive levels to drive participation. An in-depth study, Gas Peak Demand Savings, will get underway in 2020 and will quantify winter demand benefits. Testing Gas DR will allow the Company to understand the impact on gas systems and whether National Grid's role in the market has influenced market adoption.

The Company plans to target 40-45 dekatherms (DTh) of hourly peak reduction in the winter of 2020/21, with the below stated DR offerings. The Company continues to expect that the majority of these peak reduction savings will come from customers participating in the full day Extended Demand Response (EDR) pilot offering, with the remainder from customers participating in Peak Period Gas Demand Response (PPDR) pilot offering. These demand reduction pilot offerings are described in detail below. The above stated target is dependent on enrollment levels and setting an appropriate incentive level to drive participation. Since 2020/21 will be the second year running both of these pilot offerings, the budget is estimated based on the Company's current understanding of the customer base and incentives required to continue enrollment levels for the next two winter DR seasons, winters 2020/21 and 2021/22.

Customer segment addressed*:* The gas DR pilot offerings are focused on large, firm commercial and industrial customers, specifically those with gas equipment that can be curtailed without creating an unsafe environment. The goal of the project is to test the following:

- Are customers interested in participating in an incentivized Gas Demand Response program?
- If so, what are the acceptable price point values by customer business type and equipment type?
- What are the distribution system benefits?
- What is the scalability of the program?

Pilot Delivery: The gas DR pilot involves the installation of data recording hardware that provides granular usage data for participating customers. Data from the pilot will be evaluated each year, with a summary report produced in 2020 and 2021. In the winter of 2018/19, four Gas DR events were called and an average peak hour reduction of 18 DTh was achieved. In the winter of 2019/20, two Gas DR events were called and an average peak hour reduction of 19 DTh was achieved. A large resource was added in February of 2020, which only participated in one of the events, bringing down the average peak hour reduction, but increasing the potential peak hour reduction to 32 DTh in the EDR pilot offering.

Peak-Period Demand Response (PPDR): For winter 2020/21, the Company expects to increase participation in PPDR by adding one to two new customers on top of the two customers that participated in 2019/20. Many pilot parameters will remain similar to the terms of the pilot offering launched during the winter of 2019/20:

- National Grid can only call a limited number of event during a given winter.
- Customer participation in this pilot offering and the called events will be compensated via direct incentive payments, not in the form of a reduced rate.
- While enrolled customer participation in called events will be mandatory, this participation will be enforced through contractual structures and financial penalties – National Grid will not maintain a unilateral right to disrupt gas service to participating customers during called events.

Incentive Structure: As was the case in 2019/20, customer compensation for participation in the PPDR pilot offering will be based on a combination of 'availability' and 'energy' payments. Each of these rates will be standard offers to all customers, though customer earning opportunity will vary based on the volume of peak hour Dth reduction that each customer can commit to and deliver. New for 2020/21 will be the addition of a performance rating which will be applied to availability payments, providing a measure of customer reliability and limiting payments to poor performers.

Extended Demand Response (EDR): For the winter of 2019/20, the Company developed an offering for an Extended Demand Response pilot, which provided a meaningful reduction in the peak load requirement in the system. The EDR pilot offering incentivized customers with inter-day flexibility of their natural gas usage, or the existing ability to switch their heating fuel from natural gas to another fuel source for a full day period.

The basic parameters of this pilot offering match those of the PPDR pilot offering. However, in the EDR offering, the duration of each event would be 24 hours (10AM on day 1 until 10AM on day 2, Nov. 1st through March 31st). Customers in the EDR pilot offering are expected to achieve their committed demand reductions via fuel-switching. Limitations will also be put in place that will limit the number of consecutive days on which any individual customer could be called to participate in the EDR pilot offering. National Grid will have the right to call up to 6 events during the winter at the stated incentive rate.

The EDR pilot offering will provide incentives for customers who can eliminate their usage on a given day by switching to an alternative source (most typically a delivered fuel option) to meet their energy needs.

Incentive Structure: Customer compensation for participation in the EDR pilot offering will be based on the same combination of 'availability' and 'energy' payments outlined in the PPDR pilot offering description, set at different levels for each pilot offering. Each of these rates will be standard offers to all customers, though customer earnings opportunity will vary based on the volume of peak hour DTh reduction that each customer can commit to and deliver. As with the PPDR pilot offering, the EDR 'availability' incentives will now be subject to a performance rating based on a measurement of customer reliability.

Evaluation: Initial benefit cost analysis indicates that the Peak Period Demand Response pilot offering has a pathway to being cost effective. A more detailed analysis will be conducted in 2020 to determine results and inform the 2021-2023 Energy Efficiency Plan.

The gas DR pilot will be evaluated for benefits to the customer and the distribution system and to determine if it has a pathway to be cost effective at scale. Due to the small number of customers targeted by this pilot, this evaluation will be performed by the vendor, with oversight from the Company's EM&V team.

Changes in 2021: The Gas Peak Period Demand Response and Extended Demand Response pilot offerings will continue in the winter of 2020/21. The Company plans to retain current levels of enrollment in the EDR offering and slightly increase participation in the PPDR pilot offering. The addition of the previously mentioned performance rating will ensure that incentives paid by the company are aligned with the delivered reliability of customer resources. Slightly lower rates are expected to be offered in 2020/21 as well, allowing room for additional customers in PPDR.

Table 6: Docket 4600 Goals - Gas Demand Response	
4600 Goals for Gas distribution System	Advances/Detracts/Neutral
Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the long term (this applies to all energy use, not just regulated fuels).	DR has the potential for many value streams, such as alleviating local distribution system constraints, increasing system flexibility, potentially delaying infrastructure reinforcement projects, and providing a revenue stream for participants.
Strengthen the Rhode Island economy, support economic competitiveness, retain and create jobs by optimizing the benefits of a modern grid and attaining appropriate rate design structures.	DR has the potential for many value streams, such as alleviating local distribution system constraints, increasing system flexibility, potentially delaying infrastructure reinforcement projects, and providing a revenue stream for participants that would support economic growth.
Address the challenge of climate change and other forms of pollution.	While demand response does not directly address climate change, the additional insight into usage due to the increased data resolution provided to participants may create an opportunity for additional energy efficiency projects. Additionally, there may be a reduction in carbon due to participation in DR events.
Prioritize and facilitate increasing customer investment in their facilities (efficiency, distributed generation, storage, responsive demand, and the electrification of vehicles and heating) where that investment provides recognizable net benefits.	Neutral – this pilot is neutral on this goal
Appropriately compensate distributed energy resources for the value they provide to the gas system, customers, and society.	Neutral – this pilot is neutral on this goal
Appropriately charge customers for the cost they impose on the grid.	Neutral – this pilot is neutral on this goal
Appropriately compensate the distribution utility for the services it provides.	Neutral – this pilot is neutral on this goal

Align distribution utility, customer, and policy objectives and interests through the regulatory framework, including rate design, cost recovery, and incentive.	Gas DR pilot advances this goal by putting incentives towards peak reduction on the gas distribution network that helps to achieve the GHG reduction goals of the Resilient Rhode Island Act of 2014 and the Rhode Island GHG Emissions Reduction Plan of 2016. There is also an alignment in the sense that customer participation could affect system planning, which could have a larger financial impact for all customers. In this way, participants are incentivized for providing the behavior that matches the goals of the company.

4.2 Commercial and Industrial Demonstrations

The Company has prioritized one new innovation for demonstration in 2021, as well as the continuation of four demonstrations included in prior years.

a. Enzyme-based HVAC Coil Cleaning

Demonstration Stage: Plan

Innovation Overview: HVAC coils, such as those on rooftop units, become soiled with dirt and biofilm over time. This meaningfully reduces the heat transfer coefficient of the coils, which can be reversed by coil cleaning, typically with pressure washing. Pressure washing may not, however, lead to full cleaning of the coils, particularly interior sections. Companies such as Blue Box Air have proposed cleaning with a bioenzyme foam; these vendors claim that enzyme-based cleaning leads to greater efficiency improvement and can also improve indoor air quality and potentially provide disinfection.

Target Customer and Program Fit: Hotels, hospitals, office buildings, universities – locations which have high occupancy, cooling costs, and place a premium on air quality – are the best fit for this innovation.

Prior Efforts: There have been no prior efforts for this technology.

Demonstration Delivery: The Company will work with sales and marketing to identify three to four customer sites that represent a mix of the above customer types. At the customer sites, the Company will target a mixture of HVAC systems, including condenser coils, fan coils, evaporator coils, and air handers. The Company will contract Blue Box Air to perform its cleaning process at those sites, with identified equipment. The cost of the cleaning process is expected to be

significantly lower than efficiency improvements, and the goal will be to compare the cost and benefits of this cleaning process to the relatively well-understood savings associated with conventional pressure washing.

Evaluation: Vendor evaluation, pre- and post-metering, with input from National Grid EM&V

b. Strategic Energy Management (SEM)/Continuous Energy Improvement (CEI)

Demonstration Stage: Develop of Demonstrate

Innovation Overview: Strategic energy management (SEM) is a set of processes for business energy management. The main goal of SEM is to activate industrial and manufacturing customers through a multiplicity of interventions, including individual and group coaching, to address operation and maintenance measures in the short-term, pursue capital measures in the medium-term, and establish a culture of continuous improvement in its energy performance over the long-term. This last part is of critical importance in the testing of this initiative.

Target Customer and Program Fit: Manufacturing and waste water customers.

Prior Efforts: In 2019, National Grid and its implementation partner, Cascade Energy, recruited seven sites to participate in the SEM demonstration. In addition, there are four wastewater sites from Rhode Island who are participating in the Massachusetts mixed manufacturing and wastewater SEM cohort. The energy models were developed during the summer of 2019. Five workshops have been held along with numerous activities, such as energy treasure hunts, where teams walk around buildings looking for quick ways to save energy. Customer participation has been consistent and enthusiastic.

In 2020, the Continuous Energy Improvement demonstration focused on identifying operation and maintenance energy savings while also providing energy management coaching to facility operators and building managers. In Q2 of 2020, the Company claimed over 186,000 therms of gas savings, the electric savings from 2020 will be claimed in Q4 of 2020.

Demonstration Delivery: The Company and its vendor are working closely with the customer cohort to identify energy savings opportunities at their facilities. Savings are derived from a site-specific regression model that considers the host of factors that may influence energy use within a facility. While an increase in capital measures is a frequent and desirable outcome of the SEM process, it is excluded from the ultimate savings reported by the initiative.

Evaluation: Independent evaluation

c. Network Lighting Controls Plus HVAC

Demonstration Stage: Develop of Demonstrate

Innovation Overview: Network Lighting Control Plus HVAC (NLC+) go beyond traditional advanced lighting controls. NLC+ systems have the hardware and software capabilities to act as a simple, stand-alone energy management system or to interface seamlessly with more sophisticated existing building systems. In either case, local, granular occupancy and other sensing data from the NLC+ system facilitates additional savings from HVAC, plug loads, and complete energy management. This technology could be implemented as a retrofit to existing buildings, or as a component of a comprehensive new construction project. The most significant challenge in realizing savings for these projects is the integration of HVAC controls and the commissioning of the system. A successful program offering must support the commissioning process.

Target Customer and Program Fit: Initial customer segments to be considered for this analysis are offices, schools/universities, industrial, retail and hospitals.

Prior Efforts: The NCL+ demonstration was initiated in 2020. Phase I of the research, which concluded in July 2020, included a market readiness assessment for this technology. Twenty-two interviews were completed with a collection of lighting and HVAC industry representatives, customers, and internal program staff. Interviews identified barriers and opportunities for NLC+ in Rhode Island.

Demonstration Delivery: The demonstration is focused on the potential of integrating lighting and HVAC controls through the networked lighting controls system. The most significant barriers identified in the Phase I research were related to the integration of the two systems, including bridging the siloed lighting and HVAC trades. Phase II of the demonstration will include up to four customer installations. The goal of the installation will be to investigate the energy and non-energy benefits of projects, pain points in commissioning the projects, and knowledge gaps that may hinder fully realizing expected HVAC savings. Finally, Phase II will recommend if and how this technology can be included in the energy efficiency programs.

Evaluation: Vendor evaluation

d. Kitchen Exhaust

Demonstration Stage: Develop of Demonstrate

Innovation Overview: Many kitchen exhaust hoods operate with manual switches, some running all kitchen hours or even 24/7. Three kitchen exhaust measures are explored in this

demonstration: demand control ventilation, energy recovery, and electrostatic filtration. These three measures can potentially be implemented together to comprehensively reduce the level of energy required to operate a commercial kitchen. Demand control ventilation (DCV) reduces the amount of exhaust air, and corresponding make up air, by monitoring the temperature or particulates of the exhaust air and only running when required. Energy recovery can offset water heating for dishwashers by utilizing heat in kitchen exhaust. Electrostatic filtration systems offer a lower pressure drop alternative to traditional exhaust filtration systems.

Target Customer and Program Fit: These three measures are appropriate for customers with large commercial kitchens such as restaurants and hotels, especially for kitchens with long hours of operation. Energy recovery is most appropriate for customers with simultaneous cooking and dishwashing. Electrostatic filtration systems are most appropriate for customers with local codes or requirements for kitchen exhaust pollution control, common in dense urban areas.

Depending on the demonstration findings, these products will be offered to customers with prescriptive incentives. Savings should be calculated with a simple, reliable calculation tool to expedite projects.

Prior Efforts: The Kitchen Exhaust demonstration was initiated in 2020. Phase I of the demonstration project identified the savings potential for each of the individual measures and for a combined, comprehensive package. The demonstration identified ideal candidates, current market conditions, and barriers to realizing energy savings. This initial research performed 8 interviews with trade allies, manufacturers, and customers.

Demonstration Delivery: The Phase I findings of this demonstration were promising and support moving forward with customer installations for electrostatic filtration and for energy recovery. The Company supports moving kitchen hood DCV directly to program implementation given the savings potential and prior experience with the technology.

Phase II will proceed with up to five installations. One university customer is interested in an energy recovery installation. Ideally the other installations can be made at a customer facility with an existing DCV system to better understand the interactive effects of the three measures.

Evaluation: Vendor evaluation

e. Smart Valves on Chilled Water Systems

Demonstration Stage: Plan

Innovation Overview: Pressure-independent control valves, or smart valves, can be used to replace existing two- and three-way valves on chilled water systems to control chilled water entering the air handlers. The valves include built in pressure regulators that stabilize flow

through a range of pressure, allowing stable flow control under a variety of system conditions. The local controller is mounted directly on the valve itself and can report back to the building BAS where the data can be used for additional analysis such as fault detection, energy monitoring, and real time performance. Smart valves will most often result in electric savings by reducing pumping and preventing overcooling, but can yield gas savings when installed in gas absorption chiller systems.

Target Customer and Program Fit: Customers with chilled water systems and air handlers.

Prior Efforts: There have been no prior efforts for this technology.

Demonstration Delivery: The Company will work with sales and marketing to identify three to four customer sites to demonstrate the energy savings of these smart valves. The demonstration will identify target customers for the technology, market barriers and solutions, investigate how smart valves may be used as part of a broader CHW plant optimization project, and potentially make recommendations on energy savings estimates. The demonstration will use the customer installations to identify best practices for installation and commissioning of these products.

Evaluation: Vendor evaluation

f. Gas Heat Pumps

Demonstration Stage: Plan

Innovation Overview: Gas Heat Pumps are a technology that, according to manufacturers, can be twice as efficient as conventional boilers, resulting in fuel savings. Gas Heat Pumps are ideal for facilities with simultaneous need for heating and cooling including athletic facilities, pools, food and beverage processing plants, hotels, and multi-unit residential buildings.

Target Customer and Program Fit: Large commercial customers with existing conventional boilers and simultaneous need for heating and cooling.

Prior Efforts: The Gas Heat Pump demonstration was initiated in 2020 and included preliminary research into available technologies and their applications. The Company will research facilities that have installed this technology for savings and barriers to adoption. Additionally, the Company will explore the potential to install this technology on customer sites to determine savings from traditional gas options, as well as benefits compared to electric options.

Demonstration Delivery: During the next phase of this demonstration, the Company will pursue three to four customer installations.

Evaluation: Vendor Evaluation

4.3 Commercial and Industrial Assessments

The Company has proposed four new C&I assessments for 2021.

a. HVAC Automation for Demand Response

Assessment Stage: Plan

Innovation Overview: Recently, demand response programs have trended in the direction of deeper automation and faster dispatch times of the loads in question. In California, this is achieved by the OpenADR standard, which sets automation requirements for energy management systems, controls, gateways, and other communications infrastructure so that the utilities can quickly, reliably reduce load on their network.

The OpenADR standard is not necessarily appropriate for all territories. An alternative to setting a binding automation requirement for participation in DR programs is to instead incentivize the adoption of equipment and controls which will allow for future dispatchable loads and faster response times. This will future-proof the Company's efforts to provide reliable demand response and create a base of compliant systems with ratepayers, to protect against future upgrade costs to meet with more rigorous future standards for DR. Furthermore, more sophisticated building energy systems and controls may also lead to optimization of operating profiles and claimable savings.

Target Customer and Program Fit: A greater degree of automation in building energy systems is broadly applicable across commercial and industrial customers, but particularly with segments such as grocery, hospitals, universities, and hospitality.

Prior Efforts: There have been no prior efforts.

Assessment Delivery: The Company will investigate the possible causal link between incentivizing building energy automation, specifically of HVAC systems, in order to evaluate the potential for achieving future DR capacity.

Evaluation: Internal review

b. Shared Laundry Facility Clothes Washers and Dryers

Assessment Stage: Concept

Innovation Overview: Commercial laundry facilities, like those found in multifamily common laundry facilities and laundromats, represent a market that is seemingly ideal for program intervention. There is potential for an upstream or midstream program offering, since there are only four major route operators that lease equipment to customers. The laundry units are a known technology with reasonable savings estimates available. However, there has not been a focused effort to include this equipment in the energy efficiency programs due to some unusual market characteristics and relatively low per-unit savings. In particular, the laundry equipment is usually leased by the customer rather than purchased outright and the customer will often prioritize a short cycle time over energy efficiency.

Target Customer and Program Fit: Multifamily buildings with common laundry facilities and laundromats.

Prior Efforts: There have been no prior efforts.

Assessment Delivery: For this assessment, the Company will further research the feasibility, potential, and possible path forward to create a meaningful intervention. The Company will collaborate, when possible, with other energy efficiency programs who are also investigating this market.

Evaluation: Internal Review

c. Use of Submetering to Support Energy Efficiency Opportunities

Assessment Stage: Concept

Innovation Overview: A typical commercial customer may have limited insight into their energy use. The most granular information many customers have is their monthly gas and electric bill. Even customers who have AMI data may not access it or use it in a meaningful way. The limited insight into energy use within a facility may obfuscate energy and maintenance issues within a facility that the customer may otherwise want to address.

There are many options available for bringing additional insight to customers about their energy use by installing and monitoring submetering. Submetering can be designed to capture different levels of data at different intervals. For example, submetering can be applied to capture information on a whole building, end use, or on specific equipment.

Despite the potential benefits of submetering, it is also the case that submetering can prove ineffective or infeasible for some customers due to cost, technical limitations, or energy use not being a priority.

Target Customer and Program Fit: Commercial and industrial customers with the ability to use submetering data to reduce energy use.

Prior Efforts: Submetering has been discussed on and off over time, but there has not been a concerted effort to study the topic for inclusion in the energy efficiency programs.

Assessment Delivery: Submeters do not directly result in energy efficiency savings, they only provide insights that may be used to improve efficiency. Because the effectiveness of submetering depends strongly on the customer's will to use the data and make changes based on it, the Company has had a policy not to incentive the upfront costs of submetering. Instead, the Company has directly incentivized energy improvements through programs like Pay for Performance.

Evaluation: Internal Review

d. Refrigeration Leak Survey and Repair

Assessment Stage: Concept

Innovation Overview: Supermarket refrigeration systems can emit significant levels of refrigerant each year. These emissions can be harmful in their own right and can result in less efficient refrigeration systems. A leak remediation program would assist customers in identifying and repairing costly refrigeration leaks in their systems.

A focus of this assessment is to entice customers to find and repair leaks at more aggressive levels than required by regulation. The Clean Air Act specifies regular refrigerant management practices for ozone-depleting substances, such as hydrochlorofluorocarbons, hydrofluorocarbons, and hydrofluoroolefins.

Target Customer and Program Fit: Grocery stores are the primary customer. This product could be offered along with other common grocery store measures or through the custom retrofit pathway.

Prior Efforts: This is a new innovation to the programs and has not been previously examined.

Assessment Delivery: The first focus of this assessment will be to understand current customer practices and regulations around refrigerant leak remediation and the impact of those practices on energy use. After the baseline practice is understood, the Company will estimate overall savings potential for this measure.

Evaluation: Internal review

5. Residential Pilots, Demonstrations, and Assessments

5.1 Residential Pilots

The Company does not propose any new or continued Residential Pilots for 2021.

5.2 Residential Demonstrations

The Company proposes three new demonstrations for the Residential sector in 2021.

a. New Air Sealing and Insulation Products

Demonstration Stage: Plan

Innovation Overview: Several new technologies claim improvements to infiltration and insulation of homes. The two technologies of focus in this demonstration are sprayed-in air-sealing and injection foam for residential and multifamily buildings.

Vendors such as AeroBarrier operate in both new construction and renovations, offering a waterborne acrylic sealing fluid, which is sprayed into homes, covering surfaces and filling gaps up to one-quarter inch in width. The Company performs this service alongside a blower door test to monitor leakage as the spray seals gaps.

Building envelope materials offers a polyurethane foam which can be injected into building cavities to improve R-value. The conventional limitation for this technology has been the risk of toxicity and hazardous particulates, but the manufacturer of this technology believes they have solved this problem.

Target Customer and Program Fit: Both technologies have the potential to significantly improve the heating and cooling efficiency of under-insulated buildings; target customers will be single-family homes, particularly those that are under-insulated.

Demonstration Delivery: The Company will work with the residential implementation vendor to identify several residential single-family sites with a need for improved insulation and will work with the two vendors to deploy their systems at those sites. Six homes in total will participate, two each with the individual technologies and two with both deployed.

Prior Efforts: There have been no prior efforts to evaluate these products.

Evaluation: Vendor Evaluation

b. Solar Inverter Direct Load Control (ConnectedSolutions)

Demonstration Stage: Plan

Innovation Overview: The primary function of solar inverters is to convert the power generated by customer-owned solar systems from DC to AC power, which is used on the grid. However, inverters are capable of several other functions which can increase the power quality of the grid, the most beneficial being power factor correction. Using customer-owned solar inverters to implement power factor correction will decrease the amount of power (kVA) that needs to be generated and distributed, increase the capacity on the grid for real current, decrease voltage fluctuations, and reduce energy loss due to power lines heating up more than necessary.

This demonstration will explore how the demand response program utilizes this existing functionality of customer solar inverters to benefit the grid by working with customers to promote the most beneficial inverter settings.

Target Customer and Program Fit: This program will enroll customers who already have a supported solar inverter or who are installing a new solar system with an inverter from a supported inverter manufacturer.

Only smaller solar systems (less than 2 MW-AC) will be eligible for this demonstration. If this demonstration successfully improves power quality with no or minimal negative consequences to the grid, the Company will consider expanding the offering to larger customers in the future.

Prior Efforts: Power factor correction using solar inverters has been demonstrated in several areas throughout the country. However, this demonstration will be the first program to enroll customer-owned solar inverters in a BYOD (Bring-Your-Own-Device) type program at a large scale (more than 20 systems).

Demonstration Delivery: The Company will work with some of the inverter manufacturers already in the ConnectedSolutions battery measure to email customers to opt-in to updating their inverter settings. Customers will receive an enrollment incentive and an annual incentive for staying in the program. Customers may leave the program at any time. The Company will receive data from every inverter to quantify how often and how much power factor was corrected. If the customer's solar generation (kWh) is decreased larger than the annual incentive, the customer will be given an additional incentive to guarantee they are not penalized for their participation in this demonstration.

The Company's Electric Business Unit (EBU) has provided the preferred setpoints for power factor correction. The EBU will use sensors on the grid to monitor this demonstration for any negative effects or unintended consequences. The EBU may periodically change the preferred

inverter setpoints, which will be pushed out to all participating inverters by our inverter manufacturer partners.

Evaluation: The Company will receive granular performance data from every participating inverter to quantify the system benefits. An independent evaluation will be completed in conjunction with the Company's Massachusetts service area, which will be conducting an identical demonstration.

c. Gas Heat Pumps

Demonstration Stage: Plan

Innovation Overview: The innovation potential for gas heat pumps is similar for a residential context as it is for a commercial or industrial context, as described previously in section 4.2.e. Gas heat pumps may offer efficiency improvements over conventional gas boiler or furnace technologies and can provide both heating and cooling from a single piece of equipment.

Target Customer and Program Fit: Target customers are existing gas customers. Sites will include both hydronic and ducted heating distribution systems.

Demonstration Delivery: This demonstration will validate cost and performance for gas heat pumps at two to three residential single-family customer sites, as well as two to three multifamily building installations. The demonstration will identify homes with gas furnaces or boilers, installing a mix of heating and heating-plus-cooling systems. Existing gas meters will provide comparison against prior gas consumption; the evaluation of gas heat pump performance in cold temperatures will be crucial.

Prior Efforts: The Company has previously assessed the applicability of gas heat pumps to C&I customers, but investigation in the residential sector is new.

Evaluation: Independent evaluation will be engaged to determine baseline, evaluate performance, and assess potential within residential customer base, with input from the Company's EM&V team.

5.3 Residential Assessments

The company proposes one new Residential Assessment for 2021.

a. Pre-Fab Whole House Energy Refurbishment

Assessment Stage: Concept

Innovation Overview: An approach developed in the Netherlands uses demand aggregation, a high envelope efficiency approach, and supply chain coordination to deploy high-quality, prefabricated mass-scale retrofit packages that are easy to install and are financeable through utility cost savings. This approach, dubbed Energiesprong in the Netherlands, is being investigated across western Europe, California, and New York in the United States where the goal is to spearhead the creation of standardized, scalable solutions and processes that will improve the aesthetic and comfort of residential buildings while dramatically improving their energy performance. One of the innovative aspects of the offering is the use of pre-fabricated facades that can be installed much more quickly and less invasively than more traditional options which typically require bespoke envelope refurbishment unique to the building.

While the concept of completely upgrading the exterior of a home or multifamily building is compelling, the Company will explore if the capability in the supply chain exists to accomplish this at scale and cost effectively. As such, this assessment will investigate the unique Rhode Island status of what we understand to be the main components of this approach:

- Identify typical Rhode Island building life-cycle "trigger event" whereby a building owner may undertake a whole-home exterior retrofit.
- Gauge the ability to aggregate demand among building owners, harnessing their collective market power.
- Assess the building industry capability to design and develop pre-fabricated exterior improvements to substantially improve housing buildings while residents continue to live in their homes or apartments.
- Identify financing options for building owners to fund projects by capturing energy savings.

Target Customer and Program Fit: Residential and multifamily buildings in standardized configurations and building designs.

Prior Efforts: While there have not been directly related prior efforts for this concept, the residential ZNE pilot will help to identify building industry partners capable of designing, supplying, and deploying whole-home exterior retrofits.

Assessment Delivery: The primary focus of this assessment will be to understand and baseline the current status of Rhode Island components needed to support whole-home exterior retrofits. After the baseline condition is understood, and if the components and capability exist, the Company will estimate overall savings potential for this measure and roadmap necessary to promote this approach.

Evaluation: Internal review

Attachment 9

2021 Cross-Program Summary

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Introduction

The Cross-Program Summary documents how the proposed 2021 Energy Efficiency Annul Plan programs relate to other specific National Grid programs. The questions are based on Public Utility Commission Information Requests 1-8 and 1-9, from the 2019 Energy Efficiency Annual Plan, Docket 4888.

Residential and Income Eligible Residential Programs

I. Residential New Construction

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No

b. Does the program have a component funded in other programs?
   i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No

x. Electrification: heating
    i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

II. <u>EnergyStar HVAC</u>

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. No.
    ii. Yes. The centralized online marketplace provides guides and advisors for hot water heating solutions. See Marketing, Outreach & Education section in Attachment 1. The marketplace creation was funded by OPEX in several jurisdictions. In 2021, the RI EE Annual Plan includes budget for the marketplace licensing fee, rebates as a service, water heater advisor, and active DR enrollment related to energy efficiency.

b. Does the program have a component funded in other programs?
    i. No
    Yes. The centralized online marketplace has non-EE funding for the renewable energy advisor.

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. No
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No
    vi. Storage: customer side
        i. No
    vii. Grid Mod: physical infrastructure/grid-facing data
        i. No

viii. Grid Mod: customer-facing data
    i. No
ix. Electrification: vehicles
    i. No
x. Electrification: heating
    i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

III. <u>EnergyWise</u>

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. No

b. Does the program have a component funded in other programs?
    i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. No
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No
    vi. Storage: customer side
        i. No
    vii. Grid Mod: physical infrastructure/grid-facing data
        i. No
    viii. Grid Mod: customer-facing data
        i. No
    ix. Electrification: vehicles

i. No

x. Electrification: heating

i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:

i. N/A

IV. <u>EnergyWise Multifamily</u>

a. Is the program being moved from, consolidated with, or split between another program proposal?

i. No

b. Does the program have a component funded in other programs?

i. No

c. Does the primary purpose of the project or program fall into one of the following categories?

i. DR: local system

i. No

ii. DR: bulk system/transmission

i. No

iii. DG: adoption/interconnection

i. No

iv. DG: load reduction

i. No

v. Storage: grid side

i. No

vi. Storage: customer side

i. No

vii. Grid Mod: physical infrastructure/grid-facing data

i. No

viii. Grid Mod: customer-facing data

i. No

ix. Electrification: vehicles

i. No

x. Electrification: heating

i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
   i. N/A

V. Home Energy Reports

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No

b. Does the program have a component funded in other programs?
   i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

VI. <u>EnergyStar Lighting</u>

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. Yes. The centralized online marketplace is an online store that promotes energy efficient products from Products, HVAC, Energy Star Lighting, and Connected Solutions. See Marketing, Outreach & Education section in Attachment 1. It also promotes electric vehicle solution suite and a renewable energy advisor is planned. The marketplace creation was funded by OPEX in several jurisdictions. In 2021, the RI EE Annual Plan includes budget for the marketplace licensing fee, rebates as a service, water heater advisor, and active DR enrollment related to energy efficiency.

b. Does the program have a component funded in other programs?
    i. Yes. The centralized online marketplace has non-EE funding for electric vehicle solution suite and renewable energy advisor.

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. No
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No
    vi. Storage: customer side
        i. No
    vii. Grid Mod: physical infrastructure/grid-facing data
        i. No
    viii. Grid Mod: customer-facing data
        i. No

ix. Electrification: vehicles
    i. No
x. Electrification: heating
    i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

VII. Residential Consumer Products

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. Yes. The centralized online marketplace is an online store that promotes energy efficient products from Products, HVAC, Energy Star Lighting, and Connected Solutions. See Marketing, Outreach & Education section in Attachment 1. It also promotes advisors/guides for Hot Water Solutions, Electric Vehicle Solutions and renewable energy. The marketplace creation was funded by OPEX in several jurisdictions. In 2021, the RI EE Annual Plan includes budget for the marketplace licensing fee, rebates as a service, water heater advisor, and active DR enrollment related to energy efficiency.

b. Does the program have a component funded in other programs?
    i. Yes. The centralized online marketplace has non-EE funding for electric vehicle solution suite and renewable energy advisor.

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. No
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No

vi. Storage: customer side
    i. No
vii. Grid Mod: physical infrastructure/grid-facing data
    i. No
viii. Grid Mod: customer-facing data
    i. No
ix. Electrification: vehicles
    i. No
x. Electrification: heating
    i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

VIII. Residential Connected Solutions

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. Yes. The Company is eligible to earn a shareholder incentive through the System Efficiency: Annual MW Capacity Savings Performance-Based Incentive Mechanism in Docket Nos. 4770/4780.
    ii. Yes. The centralized online marketplace is an online store that promotes energy efficient products from Products, HVAC, Energy Star Lighting, and Connected Solutions. See Marketing, Outreach & Education section in Attachment 1. It also promotes electric vehicle solution suite and a renewable energy advisor is planned. The marketplace creation was funded by OPEX in several jurisdictions. In 2021, the RI EE Annual Plan includes budget for the marketplace licensing fee, rebates as a service, water heater advisor, and active DR enrollment related to energy efficiency.

b. Does the program have a component funded in other programs?
    i. Yes. Funding for the shareholder incentive for achieving Annual MW Capacity Savings is from Docket Nos. 4770/4780.
    ii. Yes. The centralized online marketplace has non-EE funding for electric vehicle solution suite and renewable energy advisor.

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. Yes
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No
    vi. Storage: customer side
        i. No
    vii. Grid Mod: physical infrastructure/grid-facing data
        i. No
    viii. Grid Mod: customer-facing data
        i. No
    ix. Electrification: vehicles
        i. No
    x. Electrification: heating
        i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. Confirm the project or program is independent from other projects and programs in the categories in c.
        i. The DR local system component of the Residential Connected Solutions Program is an independent program offering for residential customers but contributes to the Annual MW Capacity Savings Performance-Based Incentive Mechanism in Docket Nos. 4770/4780.
        ii. In 2021, Residential Connected Solutions will introduce an electric vehicle demand response offering. Customers participating in the Smart Charge pilot will not be able to participate in the Residential Connected Solutions offering so there is no cross project or program interaction.

    ii. Explain why the spending for the categories listed above should be funded in multiple programs/dockets.
        i. N/A

IX. Single Family Income Eligible Services (IES)

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No.

b. Does the program have a component funded in other programs?
   i. No.

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
   i. N/A

X. Income Eligible Multifamily

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No

b. Does the program have a component funded in other programs?
   i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
   i. N/A

XI. National Grid Energy Innovation Hub

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. Yes. The Energy Innovation Hub is split between the Energy Efficiency Plan and the Company's Application for Approval of a Change in Electric and Gas Base Distribution Rates as approved in Docket Nos. 4770/4780.

b. Does the program have a component funded in other programs?
   i. Yes. The Rhode Island Energy Innovation Hub budget is split 50%/50% between the Rhode Island Energy Efficiency Plan and the Company's Application for Approval of a Change in Electric and Gas Base Distribution Rates as approved in Docket Nos. 4770/4780 Compliance Attachment 2 Schedule 35.

	Docket No. 5076	Docket Nos. 4770/4780
	Calendar Year 2021	Rate Year Ending August 31, 2020
Operations	$187,500	$187,379
Education and Communication	$50,000	$50,000

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data

i. No

ix. Electrification: vehicles

i. No

x. Electrification: heating

i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:

i. N/A

Commercial and Industrial Programs

XII. Large Commercial New Construction

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No.

b. Does the program have a component funded in other programs?
   i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
   i. N/A

XIII. Large Commercial Retrofit

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No.

b. Does the program have a component funded in other programs?
   Yes. Advanced gas technologies such as absorption cooling, fuel cells, high efficiency industrial processes and Combined Heat and Power projects within the C&I Retrofit Program may be eligible to receive the Advanced Gas Technology (AGT) incentive. The Company anticipates that the current AGT funding levels are sufficient and therefore the Company's 2018 Distribution Adjustment Charge (DAC) Filing (Docket No. 4846) did not include a request for incremental AGT funding.

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
   i. N/A

XIV. Small Business Direct Install

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. No

b. Does the program have a component funded in other programs?
   i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. No
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. No
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:

i. N/A

XV. Commercial Connected Solutions

a. Is the program being moved from, consolidated with, or split between another program proposal?
   i. Yes. The Company is eligible to earn a shareholder incentive through the System Efficiency: Annual MW Capacity Savings Performance-Based Incentive Mechanism in Docket Nos. 4770/4780.

b. Does the program have a component funded in other programs?
   i. Yes. Funding for the shareholder incentive for achieving Annual MW Capacity Savings is from Docket Nos. 4770/4780.

c. Does the primary purpose of the project or program fall into one of the following categories?
   i. DR: local system
      i. Yes
   ii. DR: bulk system/transmission
      i. No
   iii. DG: adoption/interconnection
      i. No
   iv. DG: load reduction
      i. No
   v. Storage: grid side
      i. No
   vi. Storage: customer side
      i. Yes
   vii. Grid Mod: physical infrastructure/grid-facing data
      i. No
   viii. Grid Mod: customer-facing data
      i. No
   ix. Electrification: vehicles
      i. No
   x. Electrification: heating
      i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:

i. Confirm the project or program is independent from other projects and programs in the categories in c.
    i. The DR local system and customer-side storage components of the Commercial Connected Solutions Program will both contribute to the Annual MW Capacity Savings Performance-Based Incentive Mechanism in Docket Nos. 4770/4780.
ii. Explain why the spending for the categories listed above should be funded in multiple programs/dockets.
    i. Unlike the energy storage projects approved as part of Dockets Nos. 4770/4780 Amended Settlement Agreement, the Energy Storage Initiative in the 2021 Plan is a storage-enabled DR program that is focused on incentivizing the use of customer-owned behind-the-meter (BTM) storage to shift peak load at traditional end-use customer facilities. Through this energy efficiency offering, the Company is intending to test use cases for BTM, customer-owned storage, to identify all applications that are beneficial to customers and the grid and to grow a robust market.

XVI. <u>Commercial & Industrial Multifamily</u>

a. Is the program being moved from, consolidated with, or split between another program proposal?
    i. No.

b. Does the program have a component funded in other programs?
    i. No

c. Does the primary purpose of the project or program fall into one of the following categories?
    i. DR: local system
        i. No
    ii. DR: bulk system/transmission
        i. No
    iii. DG: adoption/interconnection
        i. No
    iv. DG: load reduction
        i. No
    v. Storage: grid side
        i. No

vi. Storage: customer side
    i. No
vii. Grid Mod: physical infrastructure/grid-facing data
    i. No
viii. Grid Mod: customer-facing data
    i. No
ix. Electrification: vehicles
    i. No
x. Electrification: heating
    i. No

d. If the response to any of subsection c. are in the affirmative, please respond to the following:
    i. N/A

Signatories

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

10/9/2020

_____

By its Attorney, Date
Andrew Marcaccio

OFFICE OF ENERGY RESOURCES

2020.10.09
10:40:23 -04'00'

By its Commissioner, Date
Nicholas Ucci

RHODE ISLAND DIVISION OF PUBLIC UTILITIES AND CARRIERS

10/13/20

By its Deputy Chief Legal Counsel, Date
Jon Hagopian

THE RHODE ISLAND ENERGY EFFICIENCY AND RESOURCES MANAGEMENT COUNCIL

_____ 10/9/20_____

By its Attorney, Date

Marisa Desautel

ACADIA CENTER

10/9/2020

By its Rhode Island Director and Staff Attorney, Date
Hank Webster

GREEN ENERGY CONSUMERS ALLIANCE, INC.

Larry F Chretien 10/13/20

By its Executive Director, Date

Larry Chretien