

**STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION**

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**In Re: The Narragansett Electric Company**

**d/b/a National Grid**

**Annual Energy Efficiency Plan for 2022**

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**Docket No. \_\_\_\_\_**

**ANNUAL ENERGY EFFICIENCY PLAN FOR 2022**

**October 1, 2021**



October 1, 2021

**VIA HAND DELIVERY & ELECTRONIC MAIL**

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

**RE The Narragansett Electric Company d/b/a National Grid  
2022 Annual Energy Efficiency Program Plan  
Docket No. \_\_\_\_\_**

Dear Ms. Massaro:

On behalf of The Narragansett Electric Company d/b/a National Grid (“National Grid” or the “Company”), enclosed, please find ten (10) copies the Company’s 2022 Annual Energy Efficiency and Conservation Procurement Program Plan (“Annual Plan”). The Annual 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 Company respectfully requests approval by the Commission of the Annual Plan as specified in Section V of the joint pre-filed direct testimony of Christopher Porter, Angela Li, Jessica Darling, John Richards, and Joshua Kessler (“Joint Pre-Filed Testimony”).

In addition to the Joint Pre-Filed Testimony, the Company is providing the Commission with the benefit cost models in electronic form<sup>1</sup> which were used in the development of the Annual Plan. 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,<sup>2</sup> the Company will be filing a Technical Reference Manual for Estimating Savings from Energy Efficiency Measures (“TRM”) for the 2022 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.

If approved as filed, the Annual Plan is expected to create over \$358.7 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 1,145,371 net lifetime MWhs, 127,561 net annual MWhs, and

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<sup>1</sup> The Company is sending two Excel files to the Commission Clerk via Egress Switch.

<sup>2</sup> On or around October 11, 2021.

Luly E. Massaro, Commission Clerk  
2022 Energy Efficiency Plan  
October 1, 2021  
Page 2 of 2

17,359 net annual kW from passive energy efficiency. The Annual Plan is anticipated to generate electric energy savings of 39,765 net annual kW from active demand reduction measures. The natural gas-funded portion of the Annual Plan is anticipated to create energy savings of 4,059,902 net lifetime MMBtus and 389,430 net annual MMBtus. In addition, the Company anticipates that investments made in energy efficiency to achieve these energy savings will add \$358.9 million to Rhode Island's state gross domestic product ("GDP"), the equivalent of 3,231 job years.

The Annual Plan proposes total budgets of \$122.6 million and \$36.7 million for electric and gas, respectively. If approved, the electric budget will be funded by \$14.3 million in proceeds from the ISO New England (ISO-NE) Forward Capacity Market (FCM), revenues from the existing energy efficiency program charge of \$0.01113 per kWh, and revenues from a fully reconciling mechanism of \$0.00312 per kWh pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5). If approved, the gas budget will be funded by revenues from the existing energy efficiency program charge of \$0.871 per dekatherm for residential customers and \$0.596 per dekatherm for non-residential customers plus revenues from a fully reconciling mechanism of \$0.350 per dekatherm for residential customers and \$0.240 per dekatherm for non-residential customers pursuant to R.I. Gen. Laws § 39-1-27.7(c)(5). Please see Section 10 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 November 17, 2021.

Thank you for your attention to this filing. If you have any questions, please contact me at 401-784-7231.

Sincerely,



Andrew S. Marcaccio

cc: Docket 5076 – 2021 Energy Efficiency Service List  
Jon Hagopian, Esq.  
John Bell, Division



**THE NARRAGANSETT ELECTRIC COMPANY**

**d/b/a NATIONAL GRID**

**RIPUC DOCKET NO. \_\_\_\_\_**

**RE: ANNUAL ENERGY EFFICIENCY PLAN FOR 2022**

**WITNESSES: CHRISTOPHER PORTER, ANGELA LI, JESSICA DARLING, JOHN RICHARDS,  
AND JOSHUA KESSLER**

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**JOINT PRE-FILED DIRECT TESTIMONY**

**OF**

**CHRISTOPHER PORTER, ANGELA LI, JESSICA DARLING,**

**JOHN RICHARDS AND JOSHUA KESSLER**

**October 1, 2022**

**THE NARRAGANSETT ELECTRIC COMPANY**

**d/b/a NATIONAL GRID**

**RIPUC DOCKET NO. \_\_\_\_\_**

**RE: ANNUAL ENERGY EFFICIENCY PLAN FOR 2022**

**WITNESSES: CHRISTOPHER PORTER, ANGELA LI, JESSICA DARLING, JOHN RICHARDS,  
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**SCHEDULES**

Schedule A: Annual Energy Efficiency Plan for 2022 and Attachments

1 **I. Introduction**

2 **Christopher Porter**

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

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

6

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

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

12

13 **Q. Please describe your education and your professional experience.**

14 A. I received a Bachelor of Arts with Honors in Political Science from Brown University in  
15 1997 and a Masters in Business Administration from the Sloan School at the  
16 Massachusetts Institute of Technology in 2005. I have worked in various consulting  
17 capacities in the energy and utility industries since 2004, including covering the North  
18 American natural gas industry for Cambridge Energy Research Associates (now IHS) and  
19 serving in the Energy & Environment practice at Charles River Associates (CRA  
20 International). Prior to joining National Grid, I was Director of Utility Services at  
21 EnerNOC, where I was responsible for overseeing delivery, implementation, and



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1 customer success for EnerNOC's bilateral utility demand response programs, utility  
2 customer engagement software, and strategic energy management businesses. I joined  
3 National Grid in November of 2017 and have been in my current role since August of  
4 2018.

5  
6 **Q. Have you previously testified before the Rhode Island Public Utilities Commission**  
7 **(PUC)?**

8 A. I testified before the PUC in the Company's 2020 Energy Efficiency Program Plan  
9 proceeding in Docket No. 4979 and most recently in the 2021-2023 Energy Efficiency  
10 Program Plan and 2021 Annual Energy Efficiency Program Plan in Docket No. 5076. I  
11 have also appeared before the PUC in Technical Sessions in Docket Nos. 5015 and 5023.  
12 I have also testified before the Massachusetts Department of Public Utilities in docket  
13 MA DPU 17-140, Joint Petition of Electric Distribution Companies for Approval of  
14 Model Solar Massachusetts Renewable Target Tariff pursuant to An Act Relative to Solar  
15 Energy.

16  
17 **Angela Li**

18 **Q. Ms. Li, please state your name and business address.**

19 A. My name is Angela Li. My business address is 40 Sylvan Road, Waltham, Massachusetts  
20 02451.

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

2 A. I am employed by National Grid USA Service Company, Inc. (Service Company), a  
3 subsidiary of National Grid USA as Lead Analyst, Customer Energy Management,  
4 Rhode Island. In this role, I am a member of the team responsible for the Company's  
5 energy efficiency residential strategy, policy, and planning in Rhode Island. I contribute  
6 to many aspects of the development of the Company's Annual Plan.

7  
8 **Q. Please describe your education and your professional experience.**

9 A. I received a Bachelor of Arts in Biology and Economics from Wellesley College and a  
10 Masters in Business Administration from Babson College. I have worked in various  
11 energy efficiency program strategy, evaluation, and policy engagements since 2002 and  
12 worked on regulated and non-regulated program design from 1994-2002 for National  
13 Grid. Prior to joining National Grid, I worked at Arthur D Little as a consultant in  
14 telecommunications and energy and focused on business process redesign. I joined  
15 National Grid in August of 1994 and have been in my current role since 2012.

16  
17 **Q. Have you previously testified before the Rhode Island Public Utilities Commission  
18 (PUC)?**

19 A. Yes. I have testified before the PUC on several occasions relating to the Company's  
20 Energy Efficiency Plans. Most recently I testified before the PUC in the Company's

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1 2021-2023 Energy Efficiency Program Plan and 2021 Annual Energy Efficiency  
2 Program Plan in Docket No. 5076.

3  
4 **Jessica Darling**

5 **Q. Ms. Darling, please state your name and business address.**

6 A. My name is Jessica Darling. My business address is 40 Sylvan Road, Waltham,  
7 Massachusetts 02451.

8  
9 **Q. By whom are you employed and in what position?**

10 A. I am employed by National Grid USA Service Company, Inc. (Service Company), a  
11 subsidiary of National Grid USA as Senior Analyst, Customer Energy Management,  
12 Rhode Island. In this role, I am a member of the team responsible for the Company's  
13 energy efficiency strategy, policy, and planning in Rhode Island. I contribute to many  
14 aspects of the development of the Company's Annual Plan.

15  
16 **Q. Please describe your education and your professional experience.**

17 A. I received a Bachelor of Arts in Political Science and Economics from Northwestern  
18 University in 2009 and a Masters in Applied Statistics from DePaul University in 2012.  
19 I have worked in various program implementation, evaluation and market research  
20 engagements related to energy efficiency since 2009, including for Elevate (formerly  
21 Elevate Energy and CNT Energy) and Opinion Dynamics. Prior to joining National Grid,

1 I was the Data Scientist at New Ecology, where I was responsible for research and  
2 evaluation of multifamily energy efficiency strategies. I joined National Grid in  
3 September of 2020 and have been in my current role since that time.

4

5 **Q. Have you previously testified before the PUC?**

6 A. No.

7

8 **John Richards**

9 **Q. Mr. Richards, please state your name and business address.**

10 A. My name is John Richards. My business address is 40 Sylvan Road, Waltham,  
11 Massachusetts 02451.

12

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

14 A. I am employed by National Grid USA Service Company, Inc. (Service Company), a  
15 subsidiary of National Grid USA as Senior Analyst, Customer Energy Management,  
16 Rhode Island. In this role, I am a member of the team responsible for the Company's  
17 energy efficiency planning, reporting, strategy, and policy. I contribute to many aspects  
18 of the development of the Company's Annual Plan.

19

1 **Q. Please describe your education and your professional experience.**

2 A. I received a Bachelor of Arts in International Studies from Dickinson College in 2009, a  
3 Masters in Environmental Science and Policy and a Masters in Business Administration  
4 from Clark University in 2017. Prior to joining National Grid, I worked for various  
5 companies and organizations the energy and environmental spaces, including the U.S.  
6 Peace Corps, Solar Flair Inc., and Energy Sherlock. I joined National Grid in August of  
7 2016 and have been in my current role since June 2017.

8  
9 **Q. Have you previously testified before the PUC?**

10 A. I testified before the PUC in prior Energy Efficiency Program Plan Dockets, beginning  
11 with Docket No. 4888.

12

13 **Joshua Kessler**

14 **Q. Mr. Kessler, please state your name and business address.**

15 A. My name is Joshua Kessler. My business address is 40 Sylvan Road, Waltham,  
16 Massachusetts 02451.

17

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

19 A. I am employed by National Grid USA Service Company, Inc. (Service Company), a  
20 subsidiary of National Grid USA as Lead Analyst, Customer Energy Management. In

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1 this role, I am responsible for planning the Company's energy efficiency strategy and  
2 budget for the Commercial and Industrial sector in Rhode Island.

3  
4 **Q. Please describe your education and your professional experience.**

5 A. I received a Bachelor of Arts in Psychology from Bucknell University in 2003 and a  
6 Masters in Business Administration from the W.P. Carey School of Business at Arizona  
7 State University in 2011. I have worked in the energy and utility industries since 2003,  
8 including as an energy analyst at KEMA Consulting, a financial and workforce planning  
9 analyst at Arizona Public Service, and a revenue requirements analyst at Northeast  
10 Utilities. Prior to joining National Grid, I was a program manager at the Massachusetts  
11 Clean Energy Center, where I was responsible for developing and implementing  
12 incentive programs for clean heating sources, such as heat pumps. I joined National Grid  
13 in December 2018 as a commercial and industrial program manager and have been in my  
14 current role since March 2021.

15  
16 **Q. Have you previously testified before the PUC?**

17 A. No.

18

1 **II. Background**

2 **Q. What is the purpose of this joint testimony?**

3 A. The purpose of our joint testimony is to highlight certain key aspects of the 2022 Annual  
4 Energy Efficiency and Conservation Procurement Plan (the Annual Plan or Plan). The  
5 purpose of this testimony is also to demonstrate that the Plan meets the applicable  
6 statutory and regulatory requirements and request PUC approval of the Plan and other  
7 items listed in Section V of this testimony.

8  
9 **Q. How did the Company prepare the Plan?**

10 A. The Company prepared the Plan in a manner consistent with all regulatory and statutory  
11 directives. Specifically, the Plan was informed by the targets set forth in Docket No.  
12 5023; the illustrative budgets, system benefit charges, and savings goals set forth in  
13 Docket No. 5076; and the updated Least Cost Procurement (LCP) Standards adopted in  
14 Docket No. 5015. The Plan is also the result of a process which involves extensive  
15 stakeholder input and engagement. These stakeholders include the Division of Public  
16 Utilities and Carriers (Division), the Office of Energy Resources (OER), the Energy  
17 Efficiency and Resource Management Council (EERMC), Energy Efficiency Technical

18

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1 Working Group (EE TWG<sup>1</sup>), and the Energy Efficiency Equity Working Group (EE  
2 EWG).

3  
4 **Q. Was the Plan endorsed by the Division, OER or EERMC?**

5 A. No. The Division, OER, and EERMC did not endorse the Plan.

6  
7 **Q. Did the Division's, OER's and the EERMC's decision not to endorse the Plan alter  
8 the Company's proposed Plan? Please explain why or why not.**

9 A. No. The Company presented the Annual Plan to the EERMC for a vote on September 23,  
10 2021. The Company did not alter the Annual Plan in response to the stakeholders'  
11 decision not to endorse the Plan. The Company did make routine technical revisions and  
12 updates since the September EERMC meeting. The Company believes that the Plan as  
13 presented to those stakeholders, and now to the PUC, meets the obligations set forth by  
14 the LCP statute and standards, while also conforming to the 2021-2023 Three-Year  
15 Energy Efficiency and Conservation Procurement Plan (Three-Year Plan) as approved by  
16 the PUC in Docket No. 5076.

17

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<sup>1</sup> 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 have previously participated in the EE TWG. The EE TWG was previously referred to as the "Collaborative."



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1 **Q. Are you sponsoring any schedules through this testimony?**

2 A. Yes. We are sponsoring the Annual Plan which is attached hereto as Schedule A.

3 The Annual Plan includes a main text and the following attachments:

4 Attachment 1: 2022 Residential and Income Eligible EE Solutions and Programs

5 Attachment 2: 2022 Commercial and Industrial (C&I) EE Solutions and Programs

6 Attachment 3: 2022 Evaluation, Measurement, and Verification Plan

7 Attachment 4: 2022 Rhode Island Test Description

8 Attachment 5: 2022 Electric Energy Efficiency Program Tables

9 Attachment 6: 2022 Gas Energy Efficiency Program Tables

10 Attachment 7: 2022 Bill and Rate Impacts

11 Attachment 8: 2022 Pilots, Demonstrations and Assessment

12 Attachment 9: 2022 Cross-Program Summary

13 Attachment 10: Definitions

14 Attachment 11: Equity Working Group Report

15

16 **III. The Annual Plan**

17 **Q. Please describe the Annual Plan.**

18 A. The Annual Plan is built as the second year of the Three-Year Plan. The Annual Plan

19 provides firm savings goals, budgets, funding plans, and a proposed performance

20 incentive mechanism (PIM) earning opportunity. Further, the Annual Plan provides more

21 detail on the strategies, market approaches, programs, and measures that will be offered

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1 in the 2022 calendar year. The Annual Plan seeks to ensure that all Rhode Island energy  
2 consumers, regardless of their geographic location, income, home ownership status,  
3 primary language, business size, or other relevant barriers are empowered to be active in  
4 their energy choices, control their energy use, and enjoy the economic, environmental,  
5 and cost savings benefits of energy efficiency.

6  
7 **Q. What is the Annual Plan expected to accomplish?**

8 The Annual Plan is expected to create \$358.7M in total benefits over the life of the  
9 installed electric, demand response, and natural gas energy efficiency measures.

10 Investments made in energy efficiency to achieve these energy savings will add \$358.9M  
11 to Rhode Island's Gross State Product (GSP), the equivalent of 3,231 job years. The  
12 projected lifetime energy savings from this Plan will avoid 608,736 tons of carbon, the  
13 equivalent of removing 121,100 passenger vehicles from the road for one year. The  
14 electric portion of the Plan will save 1,145,371 lifetime MWh over the lifetime of the  
15 installed energy efficiency measures, 127,561 net annual MWhs, 17,359 net annual kW  
16 from passive energy efficiency, and 39,765 net annual kW from active demand response.

17 The natural gas portion of the plan will save 4,059,902 lifetime MMBtu over the lifetime  
18 of installed natural gas measures and 389,430 annual MMBtu. For all fuels (electric, gas,  
19 oil, propane), combined the plan will save 6,545,548 net lifetime MMBtu and 726,108  
20 net annual MMBtu. Of the total \$358.7M benefits, \$234.6M stems from the electric  
21 portfolio and \$124.0M is derived from the natural gas portfolio.

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

2 A. The statutory requirements for LCP are set forth in R.I. Gen. Laws § 39-1-27.7. The  
3 Annual Plan is consistent with the applicable Three-Year Plan and LCP Standards which  
4 were both approved in accordance with § 39-1-27.7. More specifically, the Annual Plan  
5 satisfies the statutory requirements for LCP because it is cost effective, prudent, reliable,  
6 environmentally reliable, and because the cost of energy efficiency savings is less than  
7 the cost of additional supply.

8

9 **1. Cost Effectiveness**

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

13 A. Consistent with the LCP Standards, both the portfolios as well as the programs proposed  
14 in the Annual Plan must be cost effective. Tables 17 and 18 in the Annual Plan provide  
15 the electric and natural gas benefit cost (BC) ratio at both the program, sector and  
16 portfolio level.

17

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

19 A. Yes. Attachment 5, Table E-5 shows that the proposed portfolio of electric programs,  
20 including active demand response, is expected to have a benefit/cost ratio of 1.64 in the

21

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1 primary presentation of BCR results, which means that approximately \$1.64 in monetized  
2 lifetime benefits is expected to be created for each \$1 spent on the portfolio. Attachment  
3 6, Table G-5 shows that the proposed portfolio of gas programs is expected to have a  
4 benefit/cost ratio of 2.74 in the primary presentation of BCR results, which means that  
5 \$2.74 in lifetime benefits is expected to be created for each \$1 spent on the portfolio.  
6 Notably, these tables compare the RI Test results without economic benefits and with  
7 economic benefits included using the multipliers as applied in the past two annual plans.  
8 The rationale for omitting quantified economic benefits from the primary presentation of  
9 BCR results as a conservative approach to avoiding double counting is described in  
10 additional detail in Attachment 4. While the removal of macroeconomic benefits from the  
11 calculation of the Primary RI Test results in lower benefit-cost ratios, all programs and  
12 portfolios still achieve benefit-cost ratios of at least 1.00.

13  
14 Each program contained within the electric and gas portfolios is also cost effective as  
15 shown in Tables E-5 and G-5, respectively. Figures 1 and 2 in the main text of the  
16 Annual Plan detail the costs and benefits for the electric and gas portfolios, respectively,  
17 calculated using the RI Test. A detailed summary of the benefits and costs included in the  
18 RI Test is included in Attachment 4 of the Annual Plan, including alignment of the  
19 electric portfolio investments to the to the Docket 4600 Benefit Cost Framework.  
20

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1 Attachment 5, Table E-5 and Attachment 6, Table G-5 of the Annual Plan provide the  
2 calculations of 2022 program year cost effectiveness. Attachment 5, Table E-6 and  
3 Attachment 6, Table G-6 show the energy savings goals based on the proposed budgets.  
4 Attachment 5, Table E-7 and Attachment 6, Table G-7 show a comparison of the goals  
5 with the approved program goals from 2021. This increase in efficiency investment  
6 continues the progress of acquiring all energy efficiency resources that are cost effective  
7 and lower cost than supply.

8  
9 **2. Prudency**

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

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

20

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

2 A. (1) **Investment supporting energy efficiency goals:** In aggregate the portfolios  
3 included in the Annual Plan submission are robustly cost effective, as the benefits exceed  
4 the costs to acquire the efficiency resources and implement the programs. The electric  
5 portfolio achieves a BC Ratio of 1.64 and the gas portfolio achieves a BC Ratio of 2.76.

6  
7 (2) **Equity:** Discussions of equity with EE TWG stakeholders have helped shape and  
8 elevate the Company's explicit equity commitments. Equity is a core strategic priority of  
9 this Annual Plan that builds on the themes presented in the Three-Year Plan. The  
10 Company is committed to ensuring all customers benefit from energy efficiency  
11 programs, regardless of circumstances such as their geographic location, income, home  
12 ownership status, primary language, or business size. As a result, the Company has  
13 added multiple specific, measurable actions across the portfolio of efficiency programs.  
14 The Company also believes program-related jobs and positive economic development  
15 impacts should reach all Rhode Island communities, with particular emphasis on  
16 environmental justice/disadvantaged communities. Using an equity lens involves  
17 consideration of how the programs have been traditionally planned, designed and  
18 delivered, as well as the systemic and institutional structures that have made it easier for  
19 some customers to access the energy efficiency programs than others. A full report on  
20 the EE EWG's activities can be found in Attachment 11 of the Annual Plan.

21

---

1 (3) **Rate and Bill Impact:** The rate and bill impact analysis conducted for this Annual  
2 Plan provides one quantitative data point in determining the merits of the investment in  
3 energy efficiency overall. The rate and bill impact estimates are considered in  
4 conjunction with the robust benefit cost analysis conducted on measures, programs, and  
5 portfolios included in the Annual Plan and the analysis of the cost of alternative supply  
6 compared to the proposed energy efficiency investments.<sup>2</sup>  
7

8 **Q. What are the two different approaches that the Company uses to analyze bill**  
9 **impacts?**

10 A. The first bill impact analysis provided below is a “traditional” bill impact analysis that is  
11 typically provided in other dockets. This analysis looks at an average residential  
12 customers’ typical bill and isolates the impact of the proposed EE plan and associated  
13 charges and its impact on a customers’ overall bill. This first analysis does not include an  
14 assessment of the long-term bill savings associated with proposed energy efficiency  
15 measures for the 2022 Annual Plan.

16 A second more detailed bill impact analysis looks at the impact to customer bills over the  
17 lifetime of energy efficiency measures proposed in the Annual Plan. This more detailed  
18 analysis is included in Section 7.1.4 of the Plan and additional detail is also available in  
19 Attachment 7 to the Annual Plan.

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<sup>2</sup> 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.

1 **Q. If the Plan were to be approved as filed, what would be the resulting bill impacts for**  
2 **an average residential electric customer?<sup>3</sup>**

3 A. An average residential electric customer on the A-16 rate would see a monthly bill  
4 increase of \$1.62 or 1.3%. An average residential electric customer on the A-60 rate  
5 would see a monthly bill increase of \$1.22 or 1.3%.

6 Traditional Bill Impact Analysis (Electric)

| Rate Class | Year | Starting Bill | Ending Bill | Dollar Increase | Percent Increase |
|------------|------|---------------|-------------|-----------------|------------------|
| A-16       | 2021 | \$125.64      | \$127.26    | \$1.62          | 1.3%             |
| A-60 (25%) | 2021 | \$93.46       | \$94.68     | \$1.22          | 1.3%             |

7  
8 Table 14 in the Plan summarizes the changes in rates based on the funding plan included  
9 in this proposed Plan.

10  
11 **Q. If the Plan were to be approved as filed, what would be the resulting bill impacts for**  
12 **an average residential gas customer?<sup>4</sup>**

13 A. An average residential gas customer on the Residential Heating rate would see an annual  
14 bill increase of \$30.51 or 2.2%. An average residential gas customer on the Residential  
15 Heating Low Income rate would see an annual bill increase of \$22.88 or 2.3%.

16 Traditional Bill Impact Analysis (Gas).

17

---

<sup>3</sup> An average electric residential customer means a customer who consumes an average of 500 kWh per month.

<sup>4</sup> An average gas residential customer means a customer who consumes an average of 845 therms per year.



| Rate Class                        | Year | Starting Bill | Ending Bill | Dollar Increase | Percent Increase |
|-----------------------------------|------|---------------|-------------|-----------------|------------------|
| Residential Heating               | 2021 | \$1,368.36    | \$1,398.87  | \$30.51         | 2.2%             |
| Residential Heating<br>Low Income | 2021 | \$1,016.34    | \$1,039.22  | \$22.88         | 2.3%             |

1

2 **Q. What are the year over year increases in the proposed energy efficiency rates from**  
3 **2021 to 2022?**

4 A. Please see table below for year over year increase.

| Rate Category                  | 2021    | 2022    | 2021 - 2022 Growth |
|--------------------------------|---------|---------|--------------------|
| Gas Residential SBC (\$/therm) | 0.0871  | 0.1221  | 40%                |
| Gas C&I SBC (\$/therm)         | 0.0596  | 0.0836  | 40%                |
| Electric SBC (\$/kWh)          | 0.01113 | 0.01425 | 28%                |

5

6 **Q. The proposed budget equates to approximately a 5% increase over last year. Why**  
7 **are the energy efficiency rate increases for average electric and gas customers**  
8 **higher than 5%?**

9 A. There are several factors behind the rate increases in addition to the increased budget.

10 They include (i) other sources of funding, such as ISO-New England (ISO-NE) capacity

11 market revenue; (ii) fund balances; and (iii) anticipated electric loads and natural gas

12 sales. The largest factor to the below increases in the Energy Efficiency Charge is the

13 change in the fund balance. These significant fund balance carry overs in the 2021

14 Annual Plan (that carried over from calendar year 2020) served to substantially depress

15 the 2021 EE charge from what it would have been had there been no fund balance carry

1 over. In the proposed Plan specifically for the electric charge, 27% out of the 28%  
2 proposed increase in rates is attributable to a lower fund balance carry over. 57%<sup>5</sup> out of  
3 the proposed 40% increase in the residential gas charge, and 18% out of the 40% increase  
4 in the C&I gas charge is attributable to a lower fund balance carry over.<sup>6</sup>

6 Electric SBC Charge – Key Drivers or Changes in Rates From 2021 to Proposed 2022 Plan

|   | (a)         | (b)               | (c)                | (d)                 | (e)                                | (f)              | (g)         |
|---|-------------|-------------------|--------------------|---------------------|------------------------------------|------------------|-------------|
| Rate Category   | 2021 Charge | 2022 kWh Forecast | 5% Budget Increase | Fund Balance Update | FCM Revenue Change (Electric Only) | 2021-2022 Growth | 2022 Charge |
| Electric SBC (\$/kWh) YoY Change  | 0.01113     | -0.00073          | 0.00086            | 0.00302             | 0.00025                            | 0.00312          | 0.01425     |
| Percent Change  |             | -6.6%             | 7.7%               | 27.1%               | 2.2%                               | 28.0%            | 28.0%       |
| (1) Sum of (b) - (e) does not exactly match column (f) because each change is calculated in isolation. Interdependencies between adjustments produce a slightly different overall proposed rate adjustment. |             |                   |                    |                     |                                    |                  |             |

7

<sup>5</sup> Other factors such as the updated load forecast and the updated C&I Charge Funding Allocation put downward pressure on the Gas Residential SBC, leading to the overall proposed increase (40%) being lower than the increase driven by the fund balance (57%).

<sup>6</sup> Other factors such as the updated load forecast and the updated C&I Charge Funding Allocation put downward pressure on the Gas Residential SBC, leading to the overall proposed increase (40%) being lower than the increase driven by the fund balance (57%).

1 Gas SBC Charges – Key Drivers or Changes in Rates From 2021 to Proposed 2022 Plan

|   | (a)         | (b)               | (c)                | (d)                 | (e)   | (f)              | (g)         |
|---|-------------|-------------------|--------------------|---------------------|---|------------------|-------------|
| Rate Category   | 2021 Charge | 2022 Dth Forecast | 5% Budget Increase | Fund Balance Update | C&I Charge Funding Allocation Update (Gas Only) | 2021-2022 Growth | 2022 Charge |
| Gas Residential SBC (\$/Dth) YoY Change   | 0.871       | -0.013            | 0.006              | 0.502               | -0.140  | 0.350            | 1.221       |
| Percent Change  |             | -1.5%             | 0.7%               | 57.6%               | -16.1%  | 40.2%            | 40.2%       |
| Gas C&I SBC (\$/Dth) YoY Change   | 0.596       | -0.071            | 0.091              | 0.111               | 0.154   | 0.240            | 0.836       |
| Percent Change  |             | -11.9%            | 15.3%              | 18.6%               | 25.8%   | 40.3%            | 40.3%       |
| (1) Sum of (b) - (e) does not exactly match column (f) because each change is calculated in isolation. Interdependencies between adjustments produce a slightly different overall proposed rate adjustment.   |             |                   |                    |                     |   |                  |             |
| (2) column (e) - 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. In 2021, \$5.06 million in C&I collections went to fund the residential and income eligible sectors. In 2022, this has been increased to \$7.46M. This increases the proposed C&I EE charge and decreases the proposed Residential EE charge. |             |                   |                    |                     |   |                  |             |

2

3 **Q. Please explain how the 5% budget increase affects the energy efficiency charge and**

4 **associated bill impacts.**

5 A. As shown in the tables above, the 5% budget increase in the electric and gas portfolios

6 contributes to an 8% increase in the electric System Benefits Charge (SBC), a 1%

7 increase Gas Residential SBC, and a 15% increase in the Gas C&I SBC. The main driver

8 of the higher increase in the Gas C&I Budget and associated SBC as compared to the Gas

9 Residential Budget is a reallocation of the budgeted performance incentive from all three

10 sectors in 2021 to only the C&I sector in 2022 to account for the updated PIM.

---

1 **Q. Could you briefly explain each factor behind the rate increase and the**  
2 **corresponding bill impact of each?**

3 A. Yes. Below is a brief explanation of each factor behind the rate increases in addition to  
4 the increased budget. For additional information, please see Section 10 of the Plan.

5

6 (i) Sources of Funding (outside of EE surcharges)

7 *ISO-NE Capacity Market Revenue:* This funding source impacts electric customers only.

8 In most years, ISO-NE capacity market revenue will be earned and available. This

9 revenue is added to the EE fund balance and, therefore, has a positive impact for

10 customers, meaning it will lower their bills. In the event that obligations are not filled,

11 this revenue may be offset by resulting penalties. For 2022, the Company anticipates

12 ISO-NE Capacity Market Revenue, net of penalties, of \$14,335,281. See Attachment 5,

13 table E-1, line 4. Greater detail regarding ISO-NE Capacity Market Revenue and

14 penalties is discussed on page 31 of our testimony.

15

16 (ii) EE Fund Balance

17 Each year, there is an impact on the proposed energy efficiency surcharge that correlates

18 with the projected EE fund balance as of December 31<sup>st</sup>. If there is a surplus, it will have

19 the effect of lowering the EE surcharges and customers' bills. If there is a negative

20 balance, it will result in increased surcharges and customers' bills. For the projected

21 2021 year-end electric fund balance, the Company projects a positive fund balance of

---

1       \$4,950,253. For the projected 2021 year-end gas fund balance, the Company projects a  
2       negative fund balance of \$5,076,096. Several components make up this fund balance.

3  
4       Gas Overspend During 2021 – The Company currently projects an overspend of  
5       \$4,447,232 of the 2021 gas portfolio implementation budget. Please see Section IV of  
6       this testimony for a discussion of why that overspend was prudent. The projected  
7       overspend of \$4,447,232 makes up approximately 26% out of the 40% increase in the  
8       residential gas surcharge.

9  
10      Forecast vs. Actual Electric Loads and Natural Gas Volumes – For each year, the  
11      Company forecasts electric loads and natural gas volumes. This forecast has an impact  
12      on bills as explained further in this testimony. But, for purposes of the year end fund  
13      balance, the Company makes a forecast in where it estimates that year’s actual electric  
14      kWh sales and Dth volumes using the most recently available data. If actuals come in  
15      over the forecast, this result is a decrease in the proposed energy efficiency charge for the  
16      next year, and therefore put downward pressure on customer bills the next year. If the  
17      actuals come in under the forecast, the result is a decrease in the proposed energy  
18      efficiency charge for the next year. For 2021, the Company’s forecasted year end fund  
19      balance estimates that actual kWh sales and natural gas volumes will come in over the  
20      forecasts approved in the 2021 Annual Plan, resulting in lower proposed energy  
21      efficiency charges for 2022 and corresponding downward pressure on customer bills. The

---

1 forecasted 2021 year end actual kWhs and Dth volumes result in downward pressure on  
2 proposed 2022 energy efficiency rates. Specifically, the updated kWh sales forecast  
3 results in a 4.9% reduction for the proposed 2022 electric SBC charge, and a 5.6%  
4 reduction for both the proposed Gas Residential SBC and Gas C&I SBC 2022 electric  
5 surcharge.

6  
7 (iii) Forecast of electric loads and natural gas sales:

8 As mentioned above, for each year, the Company forecasts electric loads and natural gas  
9 volumes. The more utilization forecasted, the lower the bill. For 2022, the Company is  
10 forecasting 7,339,258,798 kWh sales for electric and 41,439,707 Dth for gas. In  
11 comparison, for 2021, the approved 6,856,927,553 kWh sales forecast for electric and  
12 38,608,003 Dth for gas. The increase in electric kWh sales forecast contributes a 6.6%  
13 decline to the electric SBC charge. The increase in the gas Dth forecast contributes a  
14 1.5% decline to the Gas Residential SBC charge and 11.9% decline to the Gas C&I SBC  
15 charge.

16  
17 Please note that updated electric and gas fund balance forecasts will be provided by  
18 November 17, 2021 per section 10 of the Plan. The proposed EE SBC charges will be  
19 adjusted accordingly.

---

1 **Q. How is the proposed Plan prudent given the bill impacts for 2022?**

2 A. One of the biggest challenges the Company faced when developing the proposed Plan  
3 was determining what is a prudent amount to invest in energy efficiency for 2022.

4 Foregoing available energy efficient investments is to the long-term detriment of  
5 customers and Rhode Islanders. On the other hand, investing too much contributes to  
6 significant surcharge increases in 2022. The Company received input from the Division,  
7 OER and EERMC. The Company considered the different perspectives offered by these  
8 agencies. Ultimately the Company determined that the current proposal strikes the right  
9 balance.

10

11 **Q. Is the Annual Plan Prudent?**

12 A. Yes. For the reasons summarized in our discussion of the factors considered when  
13 assessing prudence and provided in greater detail in Section 7.1 of the Annual Plan, the  
14 Company believes that the proposed Annual Plan meets the prudence requirement as  
15 defined in the current LCP Standards. This Plan secures cost effective energy efficiency  
16 resources that drive the realization of benefits as enumerated in the Rhode Island Test  
17 including Electric Energy Benefits, Electric Generation Capacity Benefits, Electric  
18 Transmission Capacity and Distribution Capacity Benefits, Natural Gas Benefits, Fuel  
19 Benefits, Water and Sewer Benefits, Non-Energy impacts, Price Effects, Non-embedded  
20 Greenhouse Gas Reduction Benefits, Economic Development Benefits, Non-embedded  
21 NOx Reduction Benefits, and Value of Improved Reliability.

1   **3.    Reliability**

2   **Q.    Is the proposed Annual Plan reliable?**

3    A.    Yes. Supporting the Company’s efforts to deploy energy efficiency to Rhode Island  
4       customers is a robust and long-standing evaluation, measurement, and verification  
5       (EM&V) apparatus, as noted in Section 4 of the Annual Plan. In building this Annual  
6       Plan, the Company’s Customer Energy Management team worked closely with program  
7       implementation professionals, industry experts, and vendors to assess the current state of  
8       existing programs, the potential for program scalability, the prevailing economic  
9       conditions, and the ability to deliver reliable energy savings as a result.

10

11   **4.    Environmental Responsibility**

12   **Q.    Is the proposed Annual Plan environmentally responsible?**

13    A.    Yes. As detailed in Section 5.3 of the Plan, the recently passed Act on Climate stipulates  
14       aggressive, mandatory, and time-bound emissions reductions for the state. This Annual  
15       Plan seeks to continue the progress that has been made in reducing emissions by  
16       providing customers across all sectors with ways to reduce their energy consumption.  
17       Energy efficiency can therefore contribute directly to meeting the Act on Climate’s goals.  
18       In addition to direct emissions reductions benefits, energy efficiency investments reduce  
19       the potential environmental costs and footprint of avoided infrastructure investments,  
20       support the ongoing growth and development of a sustainable, green job ecosystem in



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1 Rhode Island, and contribute to the realization of other state environmental policy goals  
2 and initiatives.

3  
4 The electric and natural gas portfolios, considered together, will reduce lifetime  
5 emissions of 608,736 tons of Carbon Dioxide. The non-embedded values of CO2 and  
6 NOx benefits generated by the Plan over the lifetime of the measures are \$71,932,048  
7 and \$2,872,086, respectively. These monetized values of non-embedded emissions are  
8 included as benefit streams in the RI Test benefit-cost assessment and in the assessment  
9 of cost of supply for the portfolio.

10  
11 In addition, the Company's energy efficiency programs help to ensure that the local  
12 workforce will exist to support the state's environmental policy goals and plays a key role  
13 in raising customer awareness of environmental issues and the impacts of their choices.  
14 Please refer to Section 7.3 of the Annual Plan for further discussion of environmental  
15 responsibility.

16  
17 **5. Cost of Additional Supply**

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

20 **A.** When analyzing the cost of additional supply, the Company evaluates at the portfolio  
21 level and not at the program or measure level. The portfolio level is appropriate to assess

---

1 the cost of energy efficiency compared to additional supply because of the aggregate  
2 impact generated by the set of measures and programs included within the portfolios. A  
3 single measure may not be cost effective or less than the cost of additional supply when  
4 viewed on its own, however, as part of a program and portfolio it may play a key role in  
5 serving a particular market segment, driving savings and further opportunities for  
6 customers to manage their energy use.

7  
8 **Q. Please describe the cost of additional supply compared to the cost of energy**  
9 **efficiency or conversation portfolios.**

10 A. Based on the Company's calculation, the total cost of energy efficiency for the electric  
11 portfolio is \$ 143.2 million and the total cost of electric supply is \$ 205.3 million. This is  
12 a total savings of \$ 62.1 million over the life of the installed energy efficiency measures  
13 from investing in energy efficiency instead of electric supply. The total cost of energy  
14 efficiency for the natural gas portfolio is \$ 45.3 million and the total cost of natural gas  
15 supply is \$ 64.2 million. This is a total savings of \$ 18.9 million over the life of the  
16 installed energy efficiency measures from investing in energy efficiency instead of  
17 natural gas supply. The methodology for calculating Cost of Supply is detailed in Section  
18 7.5 of the Annual Plan and is consistent with the methodology used in the Three-Year  
19 Plan.

20

1        **Docket 4600 Goals**

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

3        A.     Yes. Along with the quantitative benefits detailed in the Annual Plan, as measured by the  
4        RI Test, the energy efficiency investments and innovation planned for 2022 also advance  
5        the Docket 4600 principles and goals. The Company describes how the Annual Plan  
6        either advances, detracts, or remains neutral on achieving the Docket 4600 goals for the  
7        electric system in Table 22 of the Annual Plan.

8

9        **Combined Heat and Power**

10      **Q.     What CHP incentive is the Company proposing?**

11      A.     The Company is currently working with a customer, Rhode Island Grows, that is  
12      pursuing an energy efficiency incentive for a 13.3 megawatt combined heat and power  
13      system that would provide electricity, hot water, and CO<sub>2</sub> to their facility. The unique  
14      design of this CHP will allow the customer to capture the CO<sub>2</sub> from the CHP system and  
15      use the gas for their business operation.

16

17      **Q.     What is Rhode Island Grows?**

18      A.     Rhode Island Grows is an advanced controlled environment vegetable produce company  
19      with headquarters in Exeter, Rhode Island. The Company specializes in the development  
20      of advanced greenhouse facilities and vegetable produce production for the Northeast  
21      Corridor.

---

1 **Q. How does the Company plan on seeking regulatory approval of RI Grows?**

2 A. The Company notified the Division of the potential incentive for RI Grows per the  
3 standard CHP notification and approval process first approved with the 2021 Annual  
4 Plan.<sup>7</sup> On September 24, 2021, the Division informed the Company that it does not  
5 support the RI Grows CHP project as proposed at this time. The Company is currently  
6 evaluating whether to seek PUC approval of RI Grows.<sup>8</sup> If the Company elects to proceed  
7 in seeking PUC approval, it will submit a filing separate from this Annual Plan.

8  
9 **Q. Does the Company have a provisional plan in place in the event that it does not seek**  
10 **approval for the RI Grows project or if that project is not approved by the PUC in**  
11 **the separate proceeding?**

12 A. Yes. As requested by the PUC on September 22, 2021, the Company is developing a  
13 provisional plan. At a high level, the Company plans to reallocate the \$9,154,400  
14 previously allocated to RI Grows to C&I electric measures and associated support costs.  
15 This reallocation will result in more savings and benefits when compared to not  
16 reallocating the funds. However, the Company anticipates there will be fewer electric

---

<sup>7</sup> The “Authorized CHP Process” is detailed within Bates Pages 393-395 of the Company’s Combined 2021-2023 Energy Efficiency and Conservation Procurement Plan (“Three-Year Plan”) and 2021 Annual Energy Efficiency and Conservation Procurement Program Plan (“Annual Plan”) that was approved by the Public Utilities Commission in Docket No. 5076 and the Settlement Agreement, entered into on June 18, 2020, by and between the Company and the Division of Public Utilities and Carriers, that was approved by the Commission in Docket No. 4755. See Open Meeting on December 22, 2020 for approval of Combined Three-Year Plan and Annual Plan. See Open Meeting on September 1, 2020 for approval of the Settlement Agreement.

<sup>8</sup> Per Section 11.6 of the 2021 Annual Plan, the Company, through its own discretion, may proceed with an incentive offer to the customer subject to PUC approval.

---

1 energy savings than if RI Grows is approved because CHP projects typically produce  
2 savings at a lower cost of acquisition than other forms of energy efficiency, and any  
3 alternative approach to achieving savings through other programs with those re-allocated  
4 funds will be more expensive. The Company anticipates filing a provisional Attachment  
5 5 (Tables E-1 through E-10) by October 8, 2021 consistent with discussions with PUC  
6 counsel. The Company notes that the EERMC will not have an opportunity to review the  
7 provisional plan prior to the anticipated filing date.

8  
9 **Performance Incentive**

10 **Q. Please describe the Performance Incentive Mechanism and the shareholder**  
11 **incentive that the Company is seeking in the proposed Plan?**

12 A. The proposed Plan does not include any changes to the structure of the performance  
13 incentive mechanism that was approved by the PUC in docket 5076. The benefits and  
14 costs used as inputs to the PIM have been updated consistent with the benefit-cost  
15 screening and proposed budget in the 2022 Plan. Consistent with the approved  
16 performance incentive mechanism in Docket 5076, the Company is seeking electric  
17 performance incentives of \$5.5 million (all through C&I) and natural gas performance  
18 incentives of \$1.7 million (also all through C&I).

19

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1        **Forward Capacity Market**

2        **Q.     What is the Forward Capacity Market?**

3        A.     ISO-NE administers and operates wholesale energy markets across its New England  
4        territory. One of those is the Forward Capacity Market (FCM) which ensures long-term  
5        reliability of the electric grid. To do this ISO-NE administers annual Forward Capacity  
6        Auctions (FCAs) three years in advance of a 12-month Capacity Commitment Period  
7        (CCP) (e.g., the FCA auction held in February 2021 determined the Capacity Supply  
8        Obligations for the June 2024-May 2025 CCP). The purpose of the auction is for ISO-NE  
9        to ensure that it has procured (a) sufficient capacity to satisfy the reliability needs at the  
10       (b) the least-cost resource mix among the available capacity resources in New England.  
11       Capacity resources that clear the auction earn capacity supply obligations (i.e., a  
12       commitment to deliver a certain MW amount of capacity for the associated CCP).

13  
14       According to ISO-NE,

15            “The Forward Capacity Market (FCM) ensures that the New England power  
16            system will have sufficient resources to meet the future demand for  
17            electricity. Forward Capacity Auctions (FCAs) are held annually, three years  
18            in advance of the operating period. Resources compete in the auctions to  
19            obtain a commitment to supply capacity in exchange for a market-priced  
20            capacity payment. These payments help support the development of new  
21            resources. Capacity payments also help retain existing resources. For

---

1 example, they incentivize investment in technology or practices that help  
2 ensure strong performance. They also serve as a stable revenue stream for  
3 resources that help meet peak demand but don't run often the rest of the year.

4 Forward Capacity Market, ISO New England (September 30, 2021),

5 <https://www.iso-ne.com/markets-operations/markets/forward-capacity->

6 [market/](https://www.iso-ne.com/markets-operations/markets/forward-capacity-market/).

7  
8 **Q. How is Energy Efficiency related to the FCM?**

9 A. The FCM has participation models for a variety of resource types including both supply  
10 resources (i.e., power plants) and demand resources (i.e., behind the meter resources).

11 Energy efficiency is eligible to participate in the FCM as an on-peak passive demand  
12 resource. Energy efficiency program administrators such as National Grid, or any of the  
13 other New England utilities, are eligible to aggregate by region and offer energy  
14 efficiency capacity into the FCM over the useful life of the installed measures and earn  
15 payments for capacity supply obligations similar to any other generating resource. Each  
16 MW of capacity delivered by an energy efficiency resource represents a verified MW of  
17 system peak demand reduction relative to a baseline in which those energy efficiency  
18 devices had not been installed.

19

---

1 **Q. How have customers benefited from EE participation in the FCM?**

2 A. To date, National Grid has earned over \$110 million dollars in revenue which has gone  
3 directly back to Rhode Island customers by offsetting the energy efficiency systems  
4 benefit charge. The next four years will bring in an additional estimated \$50 million  
5 dollars in revenue.

6  
7 **Q. What is Financial Assurance?**

8 A. Financial Assurance is a financial mechanism in the ISO-NE FCM designed to ensure  
9 that resources (and all associated MWs) are fully constructed, commissioned, and  
10 operational (collectively referred to by ISO-NE as “commercially operational”) ahead of  
11 their capacity obligation date. The Company is expected to incur a Financial Assurance  
12 penalty of approximately \$250,230 on behalf of its energy efficiency resource in the  
13 FCM.

14  
15 **Q. How have expiring measures led to a decrease in net claimable savings?**

16 A. The portfolio will soon see a decrease in net claimable savings because of hundreds of  
17 measures that were installed toward the beginning of the FCM (such as large mechanical  
18 measures with longer-term measure lives around 10 years) will begin to come to the end  
19 of their “useful life” after which point the program can no longer claim savings for the  
20 measure. The portfolio has been structured around an aggregation of measures over years,  
21 with new measures being added to previously installed measures from the EE programs.



---

1           However, once a measure reaches the end of its “useful life” the program can no longer  
2           claim demand reduction savings for it.

3  
4           Another reason is an affective plateauing of future claimable savings due to the lighting  
5           program going away. This will happen to occur around the same time that there will be a  
6           large drop off in the claimable savings in the measures that were mentioned above with  
7           longer measure lives.

8  
9   **Q.    Why is the Company facing a financial assurance penalty?**

10  A.    Our EE FCM resources will not be able to mark all new MW as commercial, due to the  
11       pending peak in net claimable EE savings in 2022, largely due to the lighting program  
12       going away. Simultaneously, there will be a sharp decline in claimable savings from  
13       measures installed up to 10 years ago. While these concurring events are independent of  
14       each other, they will lead to our being unable to fulfill some of our capacity supply  
15       obligations (CSOs).

16  
17  **Q.    How will the Company attempt to avoid facing financial assurance penalties in the**  
18       **future?**

19  A.    Our EE FCM participation strategy is changing to mitigate FA risk of future CSOs. New  
20       resources will need to be created annually as opposed to being aggregated year over year.  
21       This will help to avoid facing a financial assurance penalty in two ways. First, the

---

1 Company will no longer be impacted by expiring measures mapped to existing resources.  
2 Instead, the Company will only need to look at forecasted new installed measures.  
3 Second, this will mean less reliance on forecasted performance. Shorter lead time  
4 between decision of new capacity obligations and fulfillment of CSO. Before each  
5 primary forward capacity auction, we will know actual installs that will count towards  
6 commercializing the CSO we have yet to pick up for about half of the CSO as opposed to  
7 having it all based on forecasted data from more than three years in advance. This new  
8 approach aims at marking each new resource CSO entirely commercial in less than one  
9 year, instead of multiple years as has been the practice up to this point.

10  
11 **Q. Can the Company recover costs where it owes Financial Assurance?**

12 A. Yes. The Settlement of the Parties in PUC Docket No. 3892, explicitly allows for this  
13 financial assurance penalty to be recovered. Specially, the Settlement of the Parties  
14 provides that,

15 In addition, as part of the FCM, all qualified auction participants are  
16 required to post Financial Assurance to provide security that the promised  
17 resource will deliver the promised MW at the promised time. If, as a result  
18 of circumstances beyond the control of the Company, the Company is  
19 unable to provide all or a portion of the megawatts of capacity proposed in  
20 its qualification packages and capacity auction bids, some or all of the  
21 financial assurance monies would be forfeited. Accordingly, the Parties

---

1           agree that the *Company should recover all prudently incurred Financial*  
2           *Assurance expenses from ISO-NE capacity payments generated by the*  
3           *demand savings represented by the Company or the energy efficiency*  
4           *program fund*, similar to the procedures described above for administrative  
5           and M&V compliance costs. (Emphasis added). Settlement of the Parties,  
6           The Narragansett Electric Company d/b/a/ National Grid Electric Demand-  
7           Side Management Programs For 2008, Appendix A, Page 9 (September 30,  
8           2021), [http://www.ripuc.ri.gov/eventsactions/docket/3892-NGrid-](http://www.ripuc.ri.gov/eventsactions/docket/3892-NGrid-DSMSettlement(11-1-07).pdf)  
9           [DSMSettlement\(11-1-07\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/3892-NGrid-DSMSettlement(11-1-07).pdf).

11   **IV.   Recovery of Projected 2021 Gas Budget Overspend**

12   **Q.    Is the Company projecting an overspend of its approved 2021 EE implementation**  
13    **budget?**

14    A.   Yes, in the gas portfolio the Company is projecting to exceed the approved  
15    implementation budget. The approved 2021 EE implementation budget for the gas  
16    portfolio was \$33,275,200, the Company's projected actual spend is \$37,722,432, which  
17    is 13% percent above the total gas portfolio implementation budget.

---

1 **Q. Is the Company requesting recovery of the projected overspend?**

2 A. Yes.

3

4 **Q. Please describe why the PUC should approve recovery of the projected overspend?**

5 A. In this case, the projected overspend is the result of the Company's decision to continue  
6 to serve gas customers within the EnergyWise SingleFamily program, which is a program  
7 in the gas portfolio. The Company notified EERMC, OER and the Division that it  
8 planned on continuing the program and provided the EERMC, OER, and Division with  
9 the projected overspend that would result from that decision. The EERMC voted in  
10 support of the decision and resulting projected overspend, provided that the overspend  
11 would not exceed 115% of the approved gas portfolio budget. The Division and OER did  
12 not object and the Division suggested that the Company provide a courtesy notification to  
13 the PUC, which the Company did on September 28, 2021. While the Company  
14 understands that the EERMC's vote to continue the program and incur the projected  
15 overspend does not automatically satisfy prudence requirements, it does serve as an  
16 important indicator that the Company made a prudent decision.

17

18 In June, the Company recognized that continuing to serve gas residential customers who  
19 have executed weatherization contracts as part of the EnergyWise Single Family program  
20 would result in a projected overspend. Immediately, active marketing for the program  
21 was suspended, wherever possible. Incentives for the gas EnergyWise Single Family

---

1 program were reduced to maximize savings and customer participation. The Company  
2 also reduced spending through coordination between programs. One example of this  
3 coordination was to not offer enhanced incentives in the gas residential HVAC program.  
4

5 The projected overspend appears to be the result of unprecedented demand in  
6 weatherization services. In 2020, the Company offered a 100% incentive in response to  
7 the COVID-19 pandemic. This incentive resulted in increased participation which carried  
8 over in 2021. Furthermore, the increased participation came at a time when the workforce  
9 was recovering from the backlogs caused by the COVID-19 pandemic. These workforce  
10 constraints and increased customer participation resulted in long backlogs that pushed  
11 2020 work into 2021. In order to best serve customers, maintain a robust workforce, and  
12 support continued program growth, the decision was made to continue to serve  
13 customers. Suspending the gas EnergyWise Single Family program could have  
14 jeopardized a workforce which took a year to rebuild and may have resulted in customer  
15 attrition due to longer wait times.  
16

17 **Q. Did the new performance incentive mechanism impact the Company's decision to**  
18 **continue serving gas customers within the EnergyWise SingleFamily in 2021. If so,**  
19 **please describe how.**

20 A. Yes. The new PIM design contributed to the Company's decision to reduce program  
21 spend where possible while minimizing potential long-term risks and negative impacts to

---

1 the programs. While the Company recognizes that, as a result of the new PIM design, the  
2 Company will earn less of a performance incentive for 2021. Despite the negative impact  
3 on the Company's 2021 shareholder incentive, the Company believes it was prudent to  
4 continue to serve customers and not take more drastic actions to reduce spend to stay  
5 within spend parameters. The Company was concerned about negative impacts on  
6 customers and contractors, and potentially long-term negative impacts on the Company's  
7 ability to drive future benefits.

8  
9 **Q. Please describe how this projected overspend may impact the Company's**  
10 **shareholder incentive.**

11 A. As of the time of this filing, the Company estimates a possible downward adjustment of  
12 \$386,750 in performance incentives due to a Service Quality Adjustment related to the  
13 projected overspend in the gas portfolio implementation budget, specifically attributable  
14 to the Residential (non-income eligible) sector.

15  
16 **Q. The Company made the decision to continue to serve gas EnergyWise Single Family**  
17 **customers and projected an overspend as a result of this decision. Does the**  
18 **Company now have insight into the results of its decision (i.e. is the program still**  
19 **cost effective)?**

---

1 A. Yes, looking at savings and spend through August 2021, the program will still be cost  
2 effective when applying the RI Test in the 2021 Annual Plan.<sup>9</sup>

3  
4 **V. Requested Approvals**

5 **Q. What approvals are the Company seeking from the PUC in connection with the**  
6 **Annual Plan?**

7 A. The Company respectfully requests that the PUC approve the following items:

8 (1) To approve the 2022 Annual Energy Efficiency and Conservation Procurement Plan  
9 as filed by the Company.

10 (2) To continue utilization of the performance incentive mechanism approved via Order  
11 No. 24225 in Docket No. 5076 for the 2022 program plan year and to approve the  
12 associated earning opportunity for 2022 as further detailed in the 2022 Annual Plan  
13 consistent with such performance incentive mechanism.

14 (3) To approve the Narragansett Electric Company's electric Energy Efficiency Program  
15 charge of 0.01425/kWh for effect on and after January 1, 2022.

16 (4) To approve the Narragansett Electric Company's gas Energy Efficiency Program  
17 charge of \$1.221/Dth for residential customers for effect on and after January 1, 2022.

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<sup>9</sup> Consistent with prior decisions on prudence, a prudence evaluation is limited to the decision made by the Company based on the facts that were known or should have been known by the Company at the time of its decision, as opposed to evaluating the results of the decision. See *In re: City of Newport Water Division Application to Change Rate Schedules*, 2010 WL 1383720 (R.I.P.U.C.).

---

1 (5) To approve the Narragansett Electric Company’s gas Energy Efficiency Program  
2 charge of \$0.836/Dth for commercial and industrial customers for effect on and after  
3 January 1, 2022.

4 (6) To approve the Company’s proposed provisional plan provided that the provisional  
5 plan only becomes effective in the event that the Company does not seek approval of  
6 the RI Grows project or if the RI Grows project is not approved by the PUC.

7 (7) To find that the Company’s decision to continue to serve customers within the gas  
8 EnergyWise Single Family program was prudent and to permit cost recovery of the  
9 resulting overspend.

10

11 **VI. Conclusion**

12 **Q. Does this conclude this joint testimony?**

13 **A.** Yes, it does.



**Schedule A  
2022 EE Plan**

**STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION**

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**In Re: The Narragansett Electric Company**

**d/b/a National Grid**

**Annual Energy Efficiency Plan for 2022**

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**Docket No. XXXX**

**ANNUAL ENERGY EFFICIENCY PLAN FOR 2022**

**October 1, 2021**

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# INTRODUCTION

## 1 Introduction

The Narragansett Electric Company d/b/a National Grid (National Grid or the Company) submits this 2022 Annual Energy Efficiency and Conservation Procurement Plan (Plan or Annual Plan) as the second annual plan submitted within 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.<sup>1</sup>

Energy efficiency is the most cost-effective way to meet customers' energy needs and is foundational to meeting Rhode Island's greenhouse gas emissions reduction mandates set forth in the 2021 Act on Climate legislation. 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 can reduce the need for additional generation, distribution, 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 demand response, and to identify their costs, benefits, and energy savings.

The Annual Plan identifies the energy savings goals for 2022 and describes the detailed strategies, programming, and investments the Company is undertaking to achieve these goals, in pursuit of the overarching goals, 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 recovery of the Rhode Island economy due to the impacts of the COVID-19 pandemic. The Company is also aware of the significant economic benefits that energy efficiency programming can offer towards recovery. The planned programs and budgets attempt to maintain flexibility to ensure continued delivery of energy efficiency services and maintain and build clean energy jobs for the 2022 program year.

This Plan will create significant benefits for Rhode Island. In total, the Plan is expected to create \$358.7M in total benefits over the life of the installed electric, demand response, and natural gas energy efficiency measures.<sup>2</sup> Investments made in energy efficiency to achieve these savings will add \$358.9M

---

<sup>1</sup> The RI Legislature recently passed an update to the 2006 Least Cost Procurement Legislation, specifically impacting the company's transfer of funds to support the Efficient Buildings Fund administered by the Rhode Island Infrastructure Bank. Refer to R.I. Pub. Laws Ch. 224 (2021), <http://webserver.rilin.state.ri.us/PublicLaws/law21/law21224.htm>

<sup>2</sup> Total benefits does not include quantified economic benefits.



to Rhode Island's Gross State Product (GSP),<sup>3</sup> the equivalent of 3,231 job years. The projected lifetime energy savings from this Plan will avoid 608,736 tons of carbon, the equivalent of removing 121,100 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 1,145,371 lifetime MWh over the lifetime of the installed energy efficiency measures, 127,561 net annual MWhs, 17,359 net annual kW from passive energy efficiency, and 39,765 net annual kW from active demand response. The natural gas portion of the plan will save 4,059,902 lifetime MMBtu over the lifetime of installed natural gas measures and 389,430 annual MMBtu. For all fuels (electric, gas, oil, propane), combined the plan will save 6,545,548 net lifetime MMBtu and 726,108 net annual MMBtu.

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<sup>4</sup> (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)<sup>5</sup> and the Energy Efficiency and Resource Management Council (EERMC) and the Energy Efficiency Equity Working Group (EWG).

The 2022 Plan satisfies the statutory requirements for Least Cost Procurement and the Least Cost Procurement Standards and is consistent with the approved Three-Year Energy Efficiency Procurement Plan (Three-Year Plan) for 2021-2023. 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.

## 1.1 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 1,145,371 net lifetime MWhs, 127,561 net annual MWhs, and 17,359 net

---

<sup>3</sup> RI GDP as of 2020: \$60.2 Billion <https://fred.stlouisfed.org/series/RINGSP>

<sup>4</sup> 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](http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf)

<sup>5</sup> 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 stakeholders. 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 Wile 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. Since 1991, membership in the EE TWG has varied because some organizations have withdrawn, and others have joined.

annual kW from passive energy efficiency. In addition, the Plan will generate savings of 39,765 net annual kW from active demand reduction measures. The natural gas-funded portion of the Plan will create savings of 4,059,902 net lifetime MMBtus and 389,430 net annual MMBtus. The Plan will generate total benefits of \$358.7 Million over the life of the measures. Of these total benefits, \$234.6 Million come from electric efficiency, passive demand reductions, and active demand response. \$124.0 Million 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 portfolios, 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 13.<sup>6</sup>

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.

---

<sup>6</sup> PUC Report and Order No. 22851 accepting the Stakeholder Report. Written Order issued July 31, 2017.

Table 1. 2022 Energy Efficiency Program Plan Summary

| Electric Programs by Sector <sup>(3)</sup> | Energy Efficiency Budget (\$000) <sup>1)</sup> | Customer Contribution (\$000) | Annual Savings (MWh) | Lifetime Savings (MWh) | \$/lifetime kWh | Summer Annual Demand Savings (kW) <sup>(5)</sup> | Active Demand Response (kW) | Total Benefits (\$000) <sup>(7)</sup> | RI Test B/C Ratio <sup>(7)</sup> | Participants <sup>(6)</sup> |
|--|--|-------------------------------|----------------------|------------------------|-----------------|--|-----------------------------|---------------------------------------|----------------------------------|-----------------------------|
| Non-Income Eligible Residential            | \$32,998                                       | \$5,065                       | 43,435               | 201,325                | 18.9            | 5,691  | 7,365                       | \$59,680                              | 1.57                             | 383,409                     |
| Income Eligible Residential <sup>8)</sup>  | \$16,801                                       | \$0                           | 4,851                | 62,816                 | 26.7            | 529  | N/A                         | \$34,126                              | 2.03                             | 7,183                       |
| Commercial and Industrial                  | \$64,631                                       | \$15,560                      | 79,275               | 881,230                | 8.5             | 11,139   | 32,400                      | \$140,814                             | 1.76                             | 3,005                       |
| Regulatory <sup>(2)</sup>                  | \$8,186  |                               |                      |                        |                 |  |                             |                                       |                                  |                             |
| <b>Subtotal</b>                            | <b>\$122,616</b>                               | <b>\$20,625</b>               | <b>127,561</b>       | <b>1,145,371</b>       | <b>12.0</b>     | <b>17,359</b>                                    | <b>39,765</b>               | <b>\$234,620</b>                      | <b>1.64</b>                      | <b>393,597</b>              |

| Gas Programs by Sector          | Energy Efficiency Budget (\$000) <sup>1)</sup> | Customer Contribution (\$000) | Annual Savings (MMBtu) | Lifetime Savings (MMBtu) | \$/lifetime MMBtu | Total Benefits (\$000) | RI Test B/C Ratio | Participants   |
|---------------------------------|--|-------------------------------|------------------------|--------------------------|-------------------|------------------------|-------------------|----------------|
| Non-Income Eligible Residential | \$14,976                                       | \$5,354                       | 153,027                | 1,223,778                | 16.61             | \$27,715               | 1.36              | 161,436        |
| Income Eligible Residential     | \$9,321  | \$0                           | 25,642                 | 491,932                  | 18.95             | \$30,607               | 3.28              | 4,248          |
| Commercial and Industrial       | \$11,208                                       | \$3,209                       | 210,760                | 2,344,192                | 5.42              | \$65,726               | 4.56              | 1,056          |
| Regulatory <sup>(2)</sup>       | \$1,219  |                               |                        |                          |                   |                        |                   |                |
| <b>Subtotal</b>                 | <b>\$36,723</b>                                | <b>\$8,563</b>                | <b>389,430</b>         | <b>4,059,902</b>         | <b>10.74</b>      | <b>\$124,049</b>       | <b>2.74</b>       | <b>166,740</b> |
| <b>TOTAL Plan</b>               | <b>\$159,340</b>                               | <b>\$29,187</b>               |                        | <b>6,530,609</b>         |                   | <b>\$358,669</b>       | <b>1.89</b>       | <b>560,338</b> |

(1) The Energy Efficiency Budget comes from E-2 and G-2 tables.

(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.

(7) "Total Benefits" and the "RI Test B/C Ratio" no longer include economic benefits previously included in the RI Test in the 2020 and 2021 plans.

Table 2. 2022 Active Demand Response Program Plan Summary

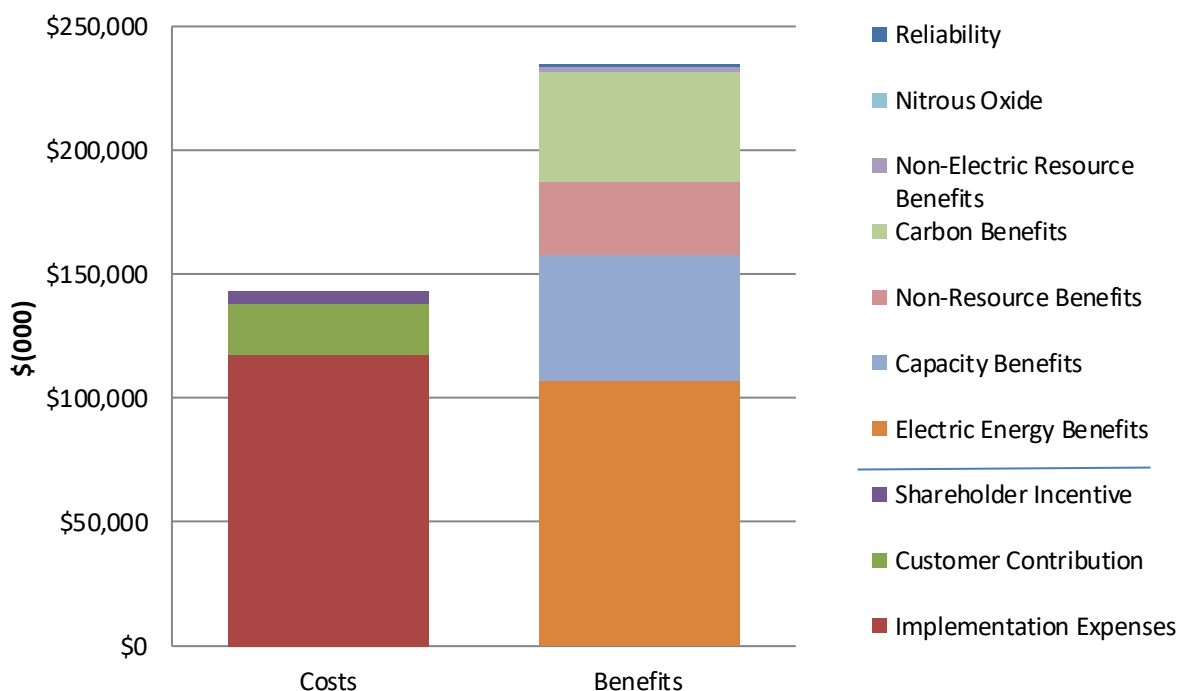
| Programs     | Implementation Spending (\$000) | Customer Contribution (\$000) | Active Demand Response (kW) | \$/kW <sup>(2)</sup> | Total Benefits (\$000) | RI Test B/C Ratio | Participation |
|--------------|---------------------------------|-------------------------------|-----------------------------|----------------------|------------------------|-------------------|---------------|
| Residential  | \$1,802                         | \$-                           | 7,365                       | \$245                | \$2,886                | 1.60              | 4,178         |
| Commercial   | \$4,386                         | \$-                           | 32,400                      | \$135                | \$10,621               | 2.42              | 180           |
| <b>Total</b> | <b>\$6,188</b>                  | <b>\$-</b>                    | <b>39,765</b>               | <b>\$156</b>         | <b>\$13,507</b>        | <b>2.18</b>       | <b>4,358</b>  |

- (1) All Residential electric customers (including Income Eligible customers) are eligible to participate in the Residential Connected Solutions program if they have the necessary equipment – a smart thermostat and central air conditioning, or a behind the meter battery.
- (2) (Implementation Spending \*1000) / Active Demand Response (kW)
- (3) "Total Benefits" and the "RI Test B/C Ratio" no longer include economic benefits previously included in the RI Test in the 2020 and 2021 plans.

## 1.2 Benefits of Investment in Energy Efficiency

Each \$1 spent on the electric energy efficiency portfolio will create \$1.64 in monetized benefits over the lifetime of the investment, and every \$1 spent on the natural gas portfolio will create \$2.74 in monetized benefits over the lifetime of the investments. Figure 1 and Figure 2 below 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 Rhode Island Test are included in Attachment 4 Rhode Island (RI) Benefit Cost Test.

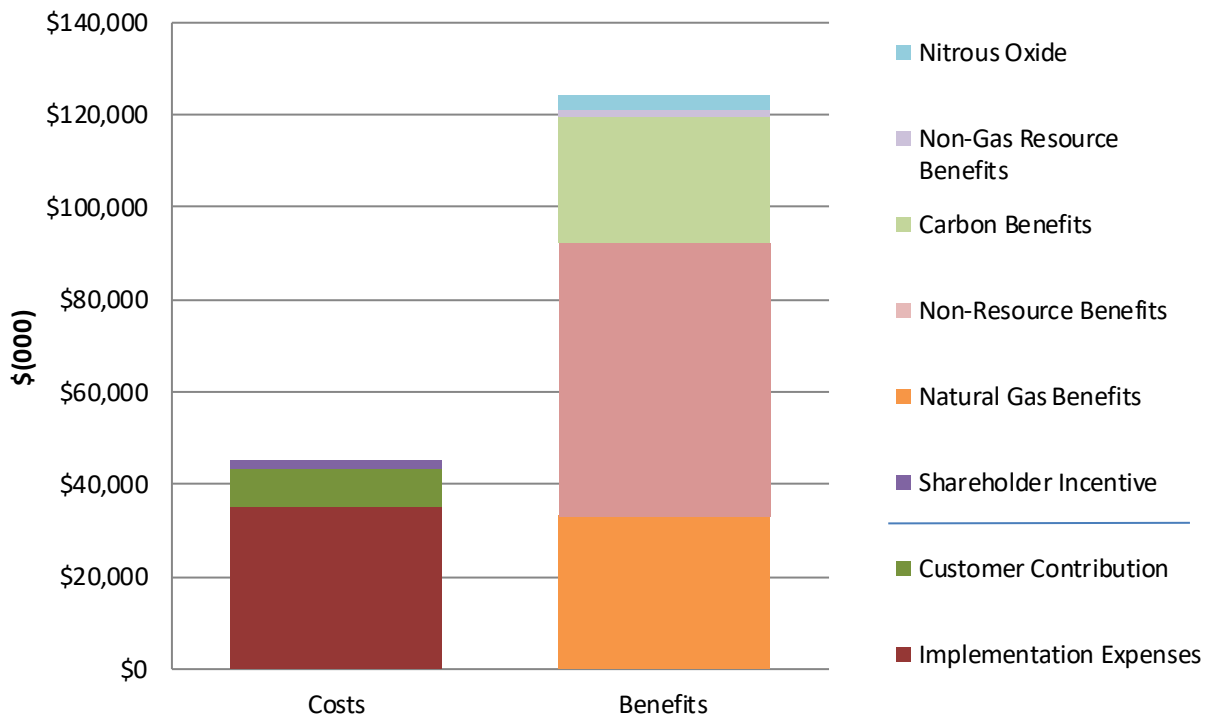
*Figure 1. 2022 Annual Plan Total Benefits and Total Costs (RI Test) for the Electric Energy Efficiency and Demand Response Portfolio<sup>7</sup>*



As described in Attachment 4, unlike in the 2020 and 2021 Annual Plans, the primary calculation of benefits conservatively excludes Economic Development because of concerns over double counting of benefits with other categories. The monetized RI Test benefits for the electric energy efficiency and demand response portfolio are calculated to be \$235M. The monetized RI Test benefits for the gas portfolio are calculated to be \$124M.

<sup>7</sup> 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 2. 2022 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 608,736 tons of carbon.<sup>8</sup> This is the equivalent of removing approximately 120,100 passenger vehicles from the road for one year.<sup>9</sup>

The Company expects that investments made in energy efficiency under this Plan will add \$359M to Rhode Island’s Gross State Product (GSP), the equivalent of 3,231 job years.<sup>10</sup> 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 2020 energy efficiency programs found that 73% of companies that deliver services on behalf of the Company’s energy efficiency programs are either headquartered or have a presence in Rhode Island.<sup>11</sup> Investments in energy

<sup>8</sup> This 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: 2021 Report” Appendix K.

<sup>9</sup> <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

<sup>10</sup> 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. These macroeconomic multipliers reflect the total impact to the Rhode Island economy and do not remove benefits counted elsewhere in the RI Test, so are shown as a separate economic impact analysis estimate.

<sup>11</sup> Guidehouse, “Rhode Island 2020 Energy Efficiency Workforce Analysis Report,” May 1, 2021 (filed as part of National Grid’s 2020 Year-End Report).

efficiency contribute to Rhode Island’s economy overall and benefit business owners and their employees who deliver these programs and services.

The cost of procuring 1,145,371 net lifetime MWh electric energy efficiency savings through the Plan is \$62.1 million less than if that electric load was met by purchasing additional electric supply. The cost of procuring 4,059,902 MMBtu lifetime natural gas energy efficiency savings through the Plan is \$18.9 million less than if that natural gas load was met by purchasing additional natural gas supply.<sup>12</sup>

This Plan includes an investment of \$122.6 million in the cost-effective electric energy efficiency portfolio in 2022. If approved, this will be funded by \$14.3 million in proceeds from the ISO New England (ISO-NE) Forward Capacity Market (FCM), revenues from the existing energy efficiency program charge of \$0.01113 per kWh, and revenues from a fully reconciling mechanism of \$0.00312 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 2022.<sup>13</sup>

This Plan also includes an investment of \$36.7 million in the cost-effective natural gas energy efficiency portfolio in 2022. If approved, this investment will be funded by revenues from the existing energy efficiency program charge of \$0.871 per dekatherm for residential customers and \$0.596 per dekatherm for non-residential customers plus revenues from a fully reconciling mechanism of \$0.350 per dekatherm for residential customers and \$0.240 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 2022.<sup>14</sup>

### 1.3 The Planning Process and Major Changes

This plan benefited from the planning process undertaken in the 2020 calendar year that resulted in the 2021 – 2023 Three-Year Plan. This Annual Plan reflects a refinement of the planning that was undertaken for the second year of that Three-Year Plan, including incorporating the latest Evaluation, Measurement, and Verification (EM&V) studies and Avoided Cost study. The Three-Year Plan was informed by 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 selected 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 prudence and reliability that are required of the Company’s proposed investments in energy efficiency, and that are applied in this and other Annual Plans.

This Annual Plan has also been guided by the LCP Standards in RI PUC Docket 5015. The Standards include an extensive set of “principles of program design” referenced in Section 2.1.1.

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<sup>12</sup> For more information on how this was calculated, see Section 7.5 of the Main Text, “Cost of Annual Plan Compared to the Cost of Energy Supply”

<sup>13</sup> See Attachment 5 Electric EE Program Tables, Table E-1 for list of funding sources and calculation of the charge.

<sup>14</sup> See Attachment 6 Gas EE Program Tables, Table G-1 for list of funding sources and calculation of the charge.

The 2022 Plan is the first year without the Residential ENERGY STAR® Lighting program. 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 continues to focus 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 through a series of Deep Dive Meetings to identify measures from the Market Potential Study and to inform the savings programs and strategies included in this Annual Plan. This has resulted in specific emphasis 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 2021, TWG members were asked to identify their priorities for this Annual Plan. TWG members also previewed and provided input on key themes and major changes in an Annual Plan Outline Memorandum circulated in June 2021. The Company is grateful for the substantive critiques and innovative ideas that have come through this process of continued engagement. The Company has incorporated many priorities of TWG stakeholders into many components of this Annual Plan. In particular, the discussions of equity 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.

#### 1.4 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 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 2022. 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 Prudence (including a detailed discussion of equity and rate and bill impacts), Reliability, Environmentally Responsible, Cost Effectiveness, and comparison to alternative cost of supply 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 eleven 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. **Attachment 10 Definitions** provides definitions of energy efficiency terms used throughout the annual plan. **Attachment 11 Equity Working Group Final Report** provides a summary of actions taken through the working group.

## STRATEGIES AND APPROACHES TO PLANNING

### 2 Programs and Priorities

#### 2.1 Strategic Overview of Programs and Priorities

This Annual Plan is built as the second year of the 2021-2023 Three-Year Energy Efficiency Plan. The Three-Year Plan set 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. This Annual Plan will help continue the trajectory of Rhode Island homes and businesses towards greater efficiency, while contributing to recovery from 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.

The Plan 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, workforce development enhancements, 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 and evolve Active Demand Response.
- Achieve cost optimization and efficiency.



- Apply a pertinent equity lens across all EE program planning and delivery, with the input and guidance of the Rhode Island Equity Working Group (EWG).

Section 2.1.1 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 2.2, 2.3, and 2.4 provide high-level summaries of program designs and changes for 2022 to Residential, Income Eligible Services, and Commercial and Industrial Programs. Section 2.5 offers detail on the cross-cutting programs for 2022, including the Community-Based Initiative, codes and standards, workforce development, and equity. Lastly, Section 2.6 provides participant definitions and planned participation numbers.

#### *2.1.1 Principles of Program Design*

This Annual Plan has been guided by the LCP Standards as updated in RI PUC Docket 5015, 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 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 5 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 Attachment 8 Pilots, Demonstrations and Assessments.

**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,<sup>15</sup> and the scale-up of the Equipment and System Performance Optimization Initiative<sup>16</sup> 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 (EnergyWise, 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 Sections 2.2, 2.3, and 2.4. Attachments 1 and 2 provide details on new measures, implementation strategies, measures specifically intended for demand or load management, and new programs. The Company intends to work towards commitments in the Annual Plan that were made from the best information available at the time. Should extenuating circumstances arise, the Company will inform stakeholders of the inability to execute a commitment or need to revise.

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 and 2021. In this Plan, the Company proposes to continue growing active demand response offerings and expanding them to new technologies that will provide new program pathways to

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<sup>15</sup> See Attachment 2 C&I Programs, Section 2 Large C&I New Construction Program.

<sup>16</sup> See Attachment 2 C&I Programs, Section 5.7 Equipment & System Performance Optimization.

additional peak demand savings.<sup>17</sup> 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** is a core strategic priority of this 2022 Annual Plan that builds on the themes presented in the 2021 - 2023 Three-Year Plan. The Company is committed to ensuring all customers benefit from the energy efficiency programs, regardless of circumstances such as their geographic location, income, home ownership status, primary language, or business size. The Company also believes program-related jobs and positive economic development impacts should reach all Rhode Island communities, with particular emphasis on environmental justice/disadvantaged communities. Using an equity lens involves consideration of how the programs have been traditionally planned, designed and delivered, as well as the systemic and institutional structures that have made it easier for some customers to access the energy efficiency programs than others. A full report on the Equity Working Group's activities can be found in Attachment 11.

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. The Company has combined this with **additional assessments** and analysis of results from EM&V, program experience, and customer and vendor feedback loops. Comprehensive projects emphasize capturing the specific opportunities identified in the Market Potential Study. For example, the bundled incentive designs in EnergyWise 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.<sup>18</sup> 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.<sup>19</sup> 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 2.5.4 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, or thought adding incremental Regional Greenhouse Gas Initiative (RGGI) incentives for

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<sup>17</sup> See Attachment 1 Residential & IES Programs, Section 9 Residential ConnectedSolutions and Attachment 2 C&I Programs, Section 8 C&I ConnectedSolutions.

<sup>18</sup> See Attachment 1 Residential & IES Programs, Section 2 EnergyWise Single Family.

<sup>19</sup> See Attachment 2 C&I Programs, sections 3.1 Performance Lighting Plus, 6.1 and 6.2 Customer and Company Owned Street Light Equipment, 6.5.1 Upstream Lighting, 6.5.2 Upstream HVAC, and 7. Small Business Direct Install.

weatherization related measures.<sup>20</sup> 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.<sup>21</sup>

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 2022 Annual Plan. As Rhode Island energy consumers face economic repercussions from COVID-19, the Company has incorporated opportunities to balance the portfolio of energy savings measures and program approaches to drive higher cost efficiencies (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.” The Company will coordinate with the Department of Labor and Training’s Real Jobs Rhode Island program<sup>22</sup>, the RI Department of Education’s PrepareRI initiative<sup>23</sup>, and other entities to help promote existing solutions to reduce or eliminate duplication of effort and expenditures. For more information see Section 2.52.5.4.

**Cost effectiveness:** The Company updates its cost effectiveness models during planning and as evaluation data and program implementation insights arrive. Refer to Attachment 4 for details of the RI Test as applied to the portfolio of 2022 Programs. The application of cost effectiveness as a design principle at a program level as required by the LCP Standards, 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.

The intentional **transformation of the lighting market** to 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 pushed for rapid adoption through multiple channels across the portfolio. This rapid adoption of high efficiency lighting was a valuable opportunity for both customers and energy efficiency program offerings in Rhode Island.

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<sup>20</sup> See Attachment 2 C&I Programs, Section 5.1 Grocery Initiative.

<sup>21</sup> See Attachment 1 Residential & IES Programs, Section 3 Multifamily.

<sup>22</sup> <https://dlt.ri.gov/realjobsri/>

<sup>23</sup> <https://www.prepare-ri.org/>

The Company anticipates a saturated residential LED lighting market by the end of 2022, at which point residential lighting will no longer be a significant driver of claimable savings or a cornerstone of residential programs. The programs phased out residential upstream lighting in 2021 and in-home installs will conclude in 2022.

When programs assess measure lives for energy efficiency products, they can be understood in two ways: the usable life of the product, or the lifespan for which the utility energy efficiency program can claim savings. The latter case is how the Company’s energy efficiency programs measure lifetime savings and is often referred to as adjusted measure lives (AMLs).

AMLs seek to account for the decision customers make to purchase an energy efficient product and whether the efficiency programs are still influencing that decision. This is done by measuring the alternative efficiency technologies in the market, their saturation, prevalence, and trajectory. For example, if today there were still a choice between incandescent lightbulbs and LED bulbs, then the programs have the opportunity to convince customers to select a more efficient option and therefore claim savings. If the market is moving rapidly towards only offering LED bulbs for customer purchase, the Company must consider that a year from today or 5 years from today, customers may not have the same choice of differing technologies. If LEDs are fully saturated in the market and are the only option to purchase, PAs cannot claim they are causing those energy savings anymore because the market moved to that point. Therefore, AMLs are adjusted down to account for this future loss of lesser efficient products. Note that the long term presence of more efficient products in the market is due, in part, to the Company’s efforts, and a mechanism should be created to give credit to the Company for its role in transforming the market.

## 2.2 Residential Programs

In 2022, the Company will continue all residential programs offered in 2021, except for the ENERGY STAR® Lighting program, while examining the potential of new technologies for inclusion in future years.

*Table 3. Overview of 2022 Residential Energy Efficiency Programs*

| Program Name  | Program Description  | Changes for 2022   |
|---|--|--|
| EnergyWise Single Family (Funded by Electric and Gas) | EnergyWise 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 | <ul style="list-style-type: none"> <li>• Equity reporting of minority and/or women owned Independent Insulation</li> <li>• Concierge service for electric resistance heated homes to facilitate the design and right sizing of a heat pump electric heating system installation.</li> <li>• Continue workforce development upskilling to support program success.</li> </ul> |

| Program Name  | Program Description  | Changes for 2022  |
|---|--|---|
|   | <p>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 well as solar opportunities provided through statewide solar initiatives. The program will continue to deliver finance opportunities to customers, such as the Heat Loan.</p> | <ul style="list-style-type: none"> <li>• Introduce 100% weatherization incentive for moderate income customers, defined as households at or below 80% state median income.</li> <li>• Optimize deeper energy upgrades by pairing weatherization at time of gas heating system upgrades to encourage downsizing of equipment, when possible. Continue incentives research.</li> </ul>  |
| <p>Multifamily<br/>(Funded by Electric and Gas)</p> | <p>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&amp;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</p>   | <ul style="list-style-type: none"> <li>• Re-launch a tiered incentive approach to encourage building owners and facility managers to include more residential unit owners in multifamily projects.</li> <li>• Provide greater customer choice to the condominium market by enabling customers to choose their own ASHP contractor and assess the impact on participation.</li> <li>• Implement recommendations from Multifamily Impact and Process Evaluations.</li> <li>• Leverage the Multifamily Census and the Nonparticipant Study to implement targeted marketing to</li> </ul> |



| Program Name | Program Description   | Changes for 2022   |
|--------------|---|--|
|              | will handle all program overlap and offer a seamless customer experience. | <p>newly identified five to 20 unit small- and medium-sized multifamily owners not served to date.</p> <ul style="list-style-type: none"> <li>• Utilize customer research to further explore new motivators to increase customer participation including Non-Energy Impacts (NEIs).</li> <li>• Explore financing opportunities for property managers and landlords to help reduce upfront co-payment burdens.</li> <li>• Explore different tactics that provide opportunities to offer relevant content in a more personalized way to customers by updating website landing pages, partaking in community events, and utilizing content hubs.</li> <li>• Continue to provide professional development opportunities for multifamily energy auditors and sub-contractors to improve sales acumen and deepen savings.</li> <li>• Provide clearer pre-weatherization remediation barrier resources to customers.</li> <li>• Examine new technologies such as monitoring-based commissioning to help serve the more unique needs of multifamily buildings.</li> </ul> |

| Program Name   | Program Description  | Changes for 2022  |
|--|--|---|
| 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.   | <ul style="list-style-type: none"> <li>• Provide a new HVAC consulting support service (in coordination with the ENERGY STAR HVAC program) targeted to high performance projects.</li> <li>• Refresh program content related to codes and standards to reflect the State’s expected code update.</li> </ul> |
| 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 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. | <ul style="list-style-type: none"> <li>• Continue 1-click promotion opportunities which were started in 2021. Enables additional data collection about customer residence to customize future marketing.</li> </ul>   |
| 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. This program trains retail sales staff about products. The program also offers refrigerator recycling.   | <ul style="list-style-type: none"> <li>• Roll out the ENERGY STAR® Retail Products Platform (ESRPP) to introduce ENERGY STAR most efficient clothes washers and refrigerators to the program.</li> </ul>  |
| Residential High-Efficiency Heating, Cooling, and Hot                                      | This program promotes the installation of high efficiency central air conditioners for electric customers and new energy efficient natural gas   | <ul style="list-style-type: none"> <li>• In both the electric and gas HVAC Programs, the heat loan has been added to the Program budget</li> </ul>  |

| Program Name  | Program Description   | Changes for 2022  |
|---|---|---|
| Water (ENERGY STAR® HVAC)<br>(Funded by Electric and 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. | <ul style="list-style-type: none"> <li>• In the Gas HVAC Program, the lower efficiency boiler and combo condensing measures were removed to increase participation in the higher efficiency boiler and combo condensing measures.</li> <li>• The Electric HVAC Program and the Residential New Construction/Major Renovations Program will work closely together to develop and implement an HVAC contractor training for the design and have installation of heating/cooling/ventilation systems in projects striving to meet Zero Net Energy and Passive House. <ul style="list-style-type: none"> <li>○ HVAC Contractors will be listed on the Program’s webpage as having completed the training and/or for the completing Zero Net Energy and Passive House projects.</li> </ul> </li> </ul> |
| Residential ConnectedSolutions (Active Demand Response)<br>(Funded by Electric) | ConnectedSolutions is National Grid’s demand response program that sends control signals to customer owned electric devices to reduce peak energy use and improve power quality on the grid. Consumers with eligible controllable equipment (e.g. Smart thermostats, batteries, and pool pumps) can enroll to participate in ConnectedSolutions. All electric consumers are eligible to participate in ConnectedSolutions.  | <ul style="list-style-type: none"> <li>• Offer a pool pump demand response program to cost-effectively reduce peak loads: enroll 25 pool pumps in 2022.</li> </ul>  |

## 2.3 Income Eligible Programs

The Company wants customers who meet the income eligibility requirements, have a high proportion of energy burden and/or difficulty paying their electric bills to participate in, and benefit from, the Company's energy efficiency programs. Therefore, the income eligible sector of the customer base is designated as a unique sector, and funding for this sector is subsidized by both non-income-eligible residential customers and commercial and industrial customers using 14.3% of total implementation funding for the electric programs, and 26.6% for natural gas programs. Total implementation funding for income eligible electric programs increased 2.3% from 2021 levels from \$16.4M to \$16.8M. Total implementation funding for income eligible gas programs increased 4.0% from 2021 levels from \$9.0M to \$9.3M in 2022.

*Table 4. Overview of 2021 Income Eligible Programs*

| Program Name   | Program Description  | Changes for 2022   |
|--|--|--|
| 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 assessment. 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. | <ul style="list-style-type: none"> <li>• Full implementation of a third-party support model to expand CAP capacity for completing weatherization jobs. This support will help ensure customers have robust services across all CAP territories and will improve the timelines for completion of weatherization jobs.</li> <li>• Rebuild and stabilize the number of qualified AMP/weatherization and heating assessors. The IES Program will prioritize assisting CAPs to train, hire and retain assessors. Indicators of success include training and hiring new assessors and regularly tracking the number of assessors.</li> <li>• Implement a workforce development program with a clear pathway to IES workforce opportunities.</li> <li>• Focused communication and engagement with landlords on behalf of interested tenants. The Company aims to increase renter participation, via landlord outreach, to effectively improve the equitable share of program resources</li> <li>• Leverage the results from the research conducted in 2021 on oil/propane heating systems to decrease the amount of emergency oil/propane heating systems replacements with like systems</li> </ul> |

| Program Name   | Program Description  | Changes for 2022   |
|--|--|--|
|  |  | <p>and alternatively defer replacement in non-emergency months with air source heat pump. In parallel, funding sources will be sought out to fund the fuel switching of oil/propane heating systems to air source heat pumps heating systems.</p> <ul style="list-style-type: none"> <li>• 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 customer education campaign on thermostat temperature control.</li> </ul> |
| 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. In most cases, there are no costs to the customer for these services as most income eligible upgrades are covered at 100%. | <ul style="list-style-type: none"> <li>• Launch a specific marketing and outreach campaign for the income eligible multifamily program.</li> <li>• Leverage the Multifamily Census to identify new prospective income eligible properties.</li> <li>• Update the website landing page and program brochure to increase ease and transparency of program offerings.</li> </ul>  |

**Income Eligible Multifamily**

\*Income Eligible Multifamily is combined with Multifamily above.

2.4 Commercial and Industrial Programs

The Commercial and Industrial (C&I) programs consistently offer highly cost-efficient savings. In planning these programs, the Company continuously evaluates evolving customer needs and market

dynamics to develop enhancements that secure deeper, more comprehensive savings while evolving program designs to drive market transformation across all customer classes and multiple end-uses.

The Company is observing a rapid reduction in claimable lighting savings due to a combination of market saturation and evaluation impacts that limit savings due to the rapid market transformation underway. Thus, in the 2022 plan, the Company has focused on new ways to help customers capture non-lighting savings while continuing to help late adopters to leverage remaining lighting savings opportunities. The specific priority measures are generally reflective of opportunities highlighted in the Market Potential Study. The innovations and enhancements in this plan 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. Finally, the Company engaged a third-party consultant to assess the barriers and opportunities associated with new and underutilized technologies listed in the Market Potential Study, and this plan incorporates the early results of that assessment.

Specific areas of focus in 2022 to increase short- and long-term adoption of non-lighting:

- Implement recommendations from a 2021 study of market barriers and opportunities, which explores measures highlighted in the Market Potential Study.
- Streamline and scale up the retro-commissioning process.
- Fund monitoring-based commissioning set-up costs.
- Scale up Small Business weatherization, leveraging additional funds provided by OER.
- Increase Active Demand Response (ADR) targets by 23% above 2021 estimates.
- Expand the focus on non-lighting measures and ADR within existing vendor-driven initiatives.
- Conduct targeted training activities for program delivery workforce on specific non-lighting measures.
- Investigate several promising new measure offerings, such as enhanced rooftop unit (RTU) controls and refrigerator leak repairs.

In addition to these focus areas, the plan describes the Company's ongoing initiatives. Changes to these program changes are summarized in Table 6 below and described in more detail in Attachment 2 C&I Programs. Some initiatives focus on specific market segments, including industrial, grocery, chain restaurant, and telecommunications. Other enhancements make participation easier or more attractive (such as the Equipment and Systems Performance Optimization), provide attractive incentives for specific customer classes (especially Small Business), and other enhancements are designed to reduce barriers to comprehensive measure adoptions (e.g., the Whole Building Streamlined pathway in New Construction introduced in 2021).

For each of the C&I programs listed in Table 5 below, an overview of 2022 offerings and changes is provided in Table 6. For more detailed program descriptions and rationales for changes, please refer to the program description tables in Attachment 2 C&I Programs.

Table 5. 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 6. Overview of 2022 Commercial and Industrial Energy Efficiency Programs

| Program Name   | Program Description  | Changes for 2022  |
|--|--|---|
| <p>Large Commercial and Industrial New Construction and Building Energy Code Support</p> <p>(Funded by Electric and Gas)</p> | <p>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. C&amp;I customers with annual electric consumption greater than 1,000,000 kWh per year are eligible.</p> <p>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</p> | <ul style="list-style-type: none"> <li>• Leverage available municipal electronic permitting information to identify trends and better characterize the State’s C&amp;I new construction market.</li> <li>• Update program elements to reflect the state’s new energy code (adoption is anticipated in early 2022)</li> <li>• Revise the <i>Performance Lighting Plus</i> 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.</li> <li>• <i>Boilers</i>: Baseline efficiency requirements may increase in 2022, which could eliminate the Company’s ability to incentivize new boilers. (New boilers represent 63% of C&amp;I Gas savings in the Marketing Potential Study.</li> <li>• <i>Upstream Products</i>: Increase goals for Upstream Food Service and HVAC due to growing demand in the past two years.</li> </ul> |

| Program Name  | Program Description  | Changes for 2022  |
|---|--|---|
|   | <p>remodeling or equipment failure and replacement. A customer who does not install energy efficient equipment at the time of construction or equipment replacement will likely never make the investment or will do so at a much greater cost later. Operations Verification or quality assurance is also offered to ensure that the equipment and systems operate as intended.</p> <p>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.</p> |   |
| <p>Large Commercial and Industrial Retrofit<br/><br/>(Funded by Electric and Gas)</p> | <p>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</p>  | <ul style="list-style-type: none"> <li>• Scale up <i>Telecommunications Initiative</i> launched in 2021, which serves mobile, fiber optic, and cable data companies through technical assistance, project management, and incentives; primarily delivering non-lighting savings.</li> </ul> |



| Program Name | Program Description  | Changes for 2022   |
|--------------|--|--|
|              | <p>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 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.</p> <p>The Company also offers education and training, such as the building operator certification (BOC) training, to support the implementation and adoption of energy efficiency.</p> | <ul style="list-style-type: none"> <li>• <i>Industrial:</i> Increase focus on mid-sized customers with 200-400 kW. Drive ADR engagement through Industrial Initiative.</li> <li>• <i>Strategic Energy Management Planning:</i> 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.</li> <li>• <i>Equipment &amp; Systems Performance Optimization:</i> Fund set-up costs for monitoring-based commissioning systems. Standardize guidance on savings calculations and baseline documentation, especially for schools. Add new gas and CHP measures to the low-cost tuning pathway, if feasible. Revisit measure persistence assumptions to reflect full lifetime benefits to customers.</li> <li>• <i>Lighting Designer Incentives:</i> Create a one-pager for new construction or major retrofit customers that articulates the benefits of hiring a lighting designer.</li> <li>• <i>Farm/Agriculture:</i> Explore simplifying the initiative for customers with multiple meter types to increase participation.</li> <li>• <i>Commercial Real Estate:</i> Explore the opportunity to develop a peer group of local commercial real estate investors or property managers interested in energy efficiency. Determine the measure mix to promote.</li> <li>• <i>Lodging:</i> Support packaged terminal heat pumps (PTHPs), potentially as a prescriptive measure. Develop marketing collateral explaining common measures for lodging facilities (PTHP's, guest room</li> </ul> |

| Program Name | Program Description | Changes for 2022  |
|--------------|---------------------|---|
|              |                     | <p>energy management systems, lighting, HVAC, kitchen equipment, etc.).</p> <ul style="list-style-type: none"> <li>• <i>Combined Heat &amp; Power optimization:</i> 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.</li> <li>• <i>Combined Heat and Power:</i> The Company is currently working with a customer that is pursuing an energy efficiency incentive for a 13.3 megawatt combined heat and power system that would provide electricity, hot water, and CO<sub>2</sub> to their facility. The unique design of this system will allow the customer to capture the CO<sub>2</sub> from the CHP and use the exhaust CO<sub>2</sub> for their business operation. The CO<sub>2</sub> harvesting will substantially reduce the greenhouse gas emissions from the CHP plant, while also reducing or eliminating the customers need to purchase food quality CO<sub>2</sub>. The incentive cost per a unit of energy is expected to be below \$0.03 per lifetime kWh, making the project one of the most cost-efficient offerings in the energy efficiency portfolio.</li> <li>• <i>Upstream Products: <b>Maintain strong</b></i> incentive support for Luminaire Level Lighting Controls (LLLCs).</li> <li>• <i>Lighting:</i> Savings will decline significantly in 2022 due to a combination of slowing demand (fewer LED conversion opportunities remain) and evaluation impacts that limit claimable savings as LED's have become much more common. Net lifetime lighting savings, excluding</li> </ul> |

| Program Name   | Program Description  | Changes for 2022  |
|--|--|---|
|  |  | Small Business, will decline roughly 42% compared to the 2021 plan.   |
| <p>Small Business<br/>Direct Install<br/><br/>(Funded by Electric and Gas)</p> | <p>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 funds are available.</p> | <ul style="list-style-type: none"> <li>• Maintain focus on non-lighting opportunities (e.g., hood controls, other HVAC controls) and savings.</li> <li>• Dramatically increase the weatherization volume for all fuel types. This is possible due to a \$1,100,000 RGGI allocation to the Company from OER for this purpose. The Company has committed, at the request of OER, to spend 50% of these funds in areas hit hardest by COVID-19. Many of these areas contain customers who may be more comfortable discussing our services in languages other than English. The Company and its vendor will deploy bilingual auditors. In addition to English, the auditor will speak either Spanish or Portuguese (the most widely spoken languages besides English in Rhode Island).</li> <li>• Work to achieve 40% of installed luminaires and retrofit kits with integrated controls.</li> <li>• Introduce a short, formal customer satisfaction survey in 2022. In addition to typical customer satisfaction questions, the Company will ask an optional question about whether the business owner identifies as a woman, minority, or LGBT. This will increase the Company's understanding the customers it serves.</li> <li>• Expand marketing to Woman and Minority Owned Enterprises (WME). This effort will extend beyond the WME registered with the state and will seek to develop relationships with groups</li> </ul> |

| Program Name  | Program Description  | Changes for 2022  |
|---|--|---|
|   |  | <p>such as the RI Black Business Association and the RI Hispanic Chamber of Commerce to understand how we can better serve these businesses.</p>  |
| <p>Commercial Connected Solutions (Active Demand Response)<br/>(Funded by Electric)</p> | <p>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 neutral and provides a customer incentive for verifiable shedding of load in response to a signal or communication from the Company.</p> | <ul style="list-style-type: none"> <li>At this time, no program changes are anticipated related to Targeted or Daily Dispatch for 2022. However, there has been a shift in customer participation from the Targeted Dispatch initiative to the Daily Dispatch offering. The increased enrollment in the Daily Dispatch is a welcome trend, which generates greater system benefits per curtailed MW than the Target Dispatch offering. Additionally, an ongoing review of summer 2021 performance may generate opportunities to improve the program in 2022. 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.</li> <li>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.</li> </ul> |
| <p>Commercial and Industrial Multifamily<br/>(Funded by Gas)</p>                        | <p>Comprehensive energy services for market-rate multifamily customers (buildings with five plus dwelling units) include energy</p>  | <ul style="list-style-type: none"> <li>Implement recommendations from Multifamily Impact and Process Evaluations (e.g., health and safety barrier remediation, redesigning the customer energy report, identifying the long-term</li> </ul>   |

| Program Name | Program Description   | Changes for 2022  |
|--------------|---|---|
|              | <p>assessments and incentives for heating and domestic hot water systems and 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&amp;I Retrofit, Residential New Construction, Income Eligible, and the ENERGY STAR® HVAC programs.</p> | <p>role of virtual energy assessments in multifamily buildings).</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Reevaluate co-branding with the Multifamily vendor to consider more prominent Company placement to facilitate greater customer trust, ease, and ultimately participation.</li> <li>• Invest in professional development for multifamily energy auditors to improve sales acumen and deepen savings.</li> </ul> |

## 2.5 Cross-Cutting Programs

### 2.5.1 Equity

The Company is committed to using the rigor of the forthcoming Participation and Multifamily Census, as well as the Nonparticipant Market Barriers Study, to understand how biases may have impacted program and customer outcomes. The Company is not waiting for full study results to begin taking action when clear opportunities to achieve greater equity in the programs exist. In 2022 the Company commits to:

- Continuing to track and report renters and rental unit participation (see Section 12.2.1);
- Tracking and reporting on minority and women owned businesses that are providing services to the EnergyWise program;

- Continuing to identify and encourage customers eligible for the discount rate to move to the discount rate;<sup>24</sup>
- Encouraging participation in Residential Income Eligible Services (IES) for new customers enrolled on the discount rate via a “welcome package”; and<sup>25</sup>
- Utilizing the Company’s new codes and standards advancement support service to target nonparticipant markets across all sectors. While the program is in its infancy, this approach overcomes traditional barriers of access by ensuring that efficiency levels are rising for all. See Section 2.5.3 Cross Cutting Programs, Codes and Standards Support for more information.
- Also, as a part of National Grid’s 2021 Annual Energy Efficiency Program Plan (2021 Annual EE Plan) and 2021-2023 Energy Efficiency Program Plan (2021-2023 EE Plan), the Company committed to working with the RI Office of Energy Resources (OER) to co-host an Equity Working Group (EWG). The objective of EWG was to provide the Company with recommendations on incorporating equity into the planning, design, and delivery of the energy efficiency programs. The EWG included over 20 people from diverse organizations and personal backgrounds. EWG members met six times between May-August 2021 to discuss and recommend strategies that could significantly increase equity in the energy efficiency programs. A full report on the EWG’s activities can be found in Appendix 11. The EWG prioritized fourteen recommendations, which the Company has used to develop additional, overarching equity-related enhancements for this 2022 Annual Plan, as shown below in Table 7:

*Table 7. EWG Recommendations and 2022 Plan Enhancements*

| <b>Rhode Island Energy Efficiency Equity Working Group (EWG) Recommendations for National Grid’s Annual Energy Efficiency Plan for 2022</b> |   |
|---|---|
| <b>1. Develop multilingual marketing and outreach materials. Use accessible language to target audiences in each publication.</b>           |   |
| Current Activity  | Program collateral is provided in multiple languages on a case-by-case basis. The Company has done research into how to reach multi-cultural customers better, including a multi-cultural focused refrigerator recycling outreach campaign in 2020. The Company has also completed research on its primary customer personas, which give consideration to educational backgrounds. The customer personas have helped the Company understand what types of messaging may resonate most with different customers. |

<sup>24</sup> See Attachment 1 Residential & IES Programs, Section 4 Income Eligible Services.

<sup>25</sup> See Attachment 1 Residential & IES Programs, Section 4 Income Eligible Services.

|   |  |
|---|--|
| 2022 Enhancement(s)   | <p>1. All Residential and Income Eligible (IE) email and direct mail will more consistently be translated into both English and Spanish.</p> <p>2. Additionally, using lessons learned from the 2020 multi-cultural focused refrigerator recycling outreach campaign, the Company will launch a new, larger multi-cultural energy efficiency education campaign with the goal of increasing energy efficiency awareness and program participation among multi-cultural customers. Beginning with Hispanic customers, the effort will support the entire customer journey using new linguistic and cultural elements for web pages, customer toolkits, call-center support, and third-party partners. If the campaign is successful, it will be expanded beyond Hispanic customers.</p> |
| Determination of Success  | A comparison of baseline data against post campaign data.  |
| <p><b>2. Hire multilingual staff and partner with trusted leaders who have the same ethnic background and that frequent popular community gathering places such as community centers and faith-based organizations.</b></p> |  |
| Current Activity  | The Company has three (3) Customer Advocates with multi-lingual capacity who provide one-on-one individual assistance to customers through community-based efforts.  |
| 2022 Enhancement(s)   | <p>1. Provide additional energy efficiency program training to the Company's existing Customer Advocates so they can more effectively speak to the benefits of the programs.</p> <p>2. Hire an additional Customer Advocate that will focus on promoting the energy efficiency programs. The new Customer Advocate will have community organizing experience and will be multi-lingual. The Advocate will deliver energy efficiency program information at community centers, faith-based organizations, multi-family housing, and other community gathering places. The Customer Advocate will leverage the expertise of existing community organizations that serve diverse households. The new hire will occur by mid-2022, before summer events begin.</p>                         |
| Determination of Success  | <p>1. The completion of additional energy efficiency training for the Company's existing Customer Advocates.</p> <p>2. The hire of a new Customer Advocate that will focus on energy efficiency.</p> <p>3. The number of events the new Customer Advocate hosts/attends.</p> <p>4. The number of customers reached at these events.</p>  |

|   |  |
|---|--|
|   | 5. The number of customers that sign up for a home energy assessment or an additional program related action as a direct result of the new Customer Advocate's community-based outreach efforts.   |
| <b>3. Include in messaging that National Grid is not code enforcement so residents can feel more comfortable.</b>   |  |
| Current Activity  | This information is not currently communicated in current program communications.  |
| 2022 Enhancement(s)   | 1. Provide vendor call centers with scripts to help answer any customer/landlord inquiries on this subject.<br><br>2. Consider adding the language to landlord outreach, as appropriate.   |
| Determination of Success  | Whether or not a script has been provided to vendor call centers.  |
| <b>4. Develop age-appropriate marketing strategies to connect with various age groups that live in a household such as utilizing social media, apps, and text messaging to reach new audiences and help engage customers with their energy usage.</b> |  |
| Current Activity  | Social media is one of the Company's primary outreach and communication methods, with advertisements and messages placed on Facebook, Instagram, Twitter, Snapchat, and NextDoor. Because of legal limitations and to ensure emergency communications are seen by customers, text messaging is currently only used to convey outage information. |
| 2022 Enhancement(s)   | N/A  |
| Determination of Success  | N/A  |
| <b>5. Partner with other home visiting programs to expand the reach and impact of National Grid's energy efficiency programs.</b>   |  |
| Current Activity  | The Company provides energy efficiency outreach and educational materials to other programs on a case-by-case basis (e.g. "Cooling Flyer" for HousingWorksRI).   |



|  |   |
|--|---|
| 2022 Enhancement(s)  | By March 2022, establish a working group to explore how to more comprehensively leverage other home visiting programs for energy efficiency outreach and education. The working group will be facilitated by the Company and will include home visiting program representatives. The working group will make related recommendations for the 2023 Annual Energy Efficiency Plan.                            |
| Determination of Success   | 1. Whether or not a working group is established by March 2022.<br>2. Whether or not the working group completes recommendations by August 2022 for the 2023 Annual Energy Efficiency Plan.   |
| <b>6. Allocate a proportion of Energy Efficiency marketing budgets to municipalities for mailing energy efficiency materials; some municipalities use third parties for mailing.</b> |   |
| Current Activity   | The Company's Community Initiative currently supports participating municipalities in promoting the energy efficiency programs.   |
| 2022 Enhancement(s)  | 1. Continue to support municipality efforts to promote energy efficiency through the Community Initiative.<br>2. Test the inclusion of energy efficiency program information in the water/sewer bills of one or more of the 2022 Community Initiative participants.   |
| Determination of Success   | 1. The continuation of the Community Initiative.<br>2. Call volume after the water/sewer bill insert(s).  |
| <b>7. Provide incentives to community groups that are serving vulnerable populations.</b>  |   |
| Current Activity   | The Company does not provide direct incentives to community groups that serve vulnerable populations. The Company has regularly partnered with food banks to provide LED bulbs and energy efficiency information with household distributions. As mentioned under recommendation 5, the Company also provides energy efficiency outreach and education materials to other programs on a case-by-case basis. |
| 2022 Enhancement(s)  | The Company will expand collateral for more community groups that serve vulnerable populations.   |
| Determination of Success   | Number of community groups that receive collateral for distribution.  |
| <b>8. Develop a mechanism that allows participation or action to occur immediately after the marketing step.</b>   |   |

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|--|---|
| Current Activity   | Each program has a different lead time based on the customer journey for that specific program.   |
| 2022 Enhancement(s)  | Expand follow-up outreach for customers who receive a recommendation from the on-line home energy assessment, in-home/virtual home energy assessment, and/or home energy reports.   |
| Determination of Success   | Tactics completed to increase follow-up outreach for customers.   |
| <b>9. Benchmark Energy Efficiency Program participation data for race, geography, socioeconomic status, language, age of home, age of owner, age of renter, heating fuel type, type and age of heating /hot water/cooling systems.</b> |   |
| Current Activity   | Through the Evaluation, Measurement and Verification team (EM&V) the Company is currently conducting a Participant and Multifamily (MF) Census study, and a Nonparticipant study, which will be completed in early 2022. The dataset produced for these studies will include account level detail on customer geography, socio-economic status, primary language spoken, age of home, age of owner/renter, age of heating/hot water/cooling system(s) being replaced, type of primary household heating system, primary heating fuel, and program participation. Education, race and ethnicity will be gathered by block group. Some information will be populated with third party data but will be useful in aggregate. The information from these studies will be compiled for public reports. The Participant and MF Census study will also provide implementation and marketing teams with a comprehensive database of MF buildings that includes building characteristics and an indicator of whether or not each building has participated in a program. |
| 2022 Enhancement(s)  | <ol style="list-style-type: none"> <li>1. Work with external stakeholders to determine if the data sets and each related report should be refreshed on a regular basis.</li> <li>2. Using internal data, establish a separate, regular report by Q2 2022 that shows participation for the EnergyWise, Multifamily, and the Income Eligible Single-Family programs at the zip code level. Utilize the report to target outreach.</li> <li>3. Continue gathering rental unit participation data and reporting on that information quarterly at the “sector level meetings” with the RI Office of Energy Resources, their Consultant Team, and the Division of Public Utilities and Carriers.</li> </ol>   |

|  |  |
|--|--|
| Determination of Success   | <ol style="list-style-type: none"> <li>1. Completion of the Participant, Nonparticipant, and MF Census studies.</li> <li>2. Presentation of report results at a public meeting, such as the Energy Efficiency Resource Management Council (EERMC).</li> <li>3. Creation of a regular, zip code level participation report by Q2 2022 to target outreach for the EnergyWise, MF, and Income Eligible Single-Family programs.</li> <li>4. Whether or not rental unit participation data continues to be gathered and reported quarterly at the “sector level meetings”.</li> </ol> |
| <b>10. Track late payments and shut offs.</b>  |  |
| Current Activity   | National Grid currently tracks this information and submits it to the RI PUC. The report can be found at:<br><a href="http://www.ripuc.ri.gov/eventsactions/docket/4770page.html">http://www.ripuc.ri.gov/eventsactions/docket/4770page.html</a> , under Other Compliance Reports, National Grid's Low-Income Monthly pursuant to Article II, Section C.22.f. of the Amended Settlement Agreement.   |
| 2022 Enhancement(s)  | None are needed since we already track this information and the data is public.  |
| Determination of Success   | N/A  |
| <b>11. Align energy efficiency programs with healthcare and partner to achieve healthcare goals, promote further engagement, and sharing health outcome and impact data.</b> |  |
| Current Activity   | N/A  |
| 2022 Enhancement(s)  | See recommendation 5. The working group will include healthcare home visiting programs as a part of their discussions.   |
| Determination of Success   | <ol style="list-style-type: none"> <li>1. Whether or not a working group is established by March 2022.</li> <li>2. Whether or not the working group completes recommendations by August 2022 for the 2023 Annual Energy Efficiency Plan.</li> </ol>  |
| <b>12. Perform a full review of all HR policies and remove outdated policies that restrict hiring such as background checks.</b>   |  |

|  |   |
|--|---|
| Current Activity   | Anyone that will be on a customers' property on the Company's behalf, or has access to customer data, is required to go through a background check process. There are different levels of background checks for different levels of customer interaction. For individuals that go on customers' property, the background check generally includes (among other things) a drug screening and an assessment of criminal history. There is a "needs review" process any time there is a negative finding. A candidate whose background check "needs review" is notified so they can have the opportunity to provide further explanation. Candidates can be granted an "exception" for any negative finding(s) that does not directly impact the safety of a customer or their property.  |
| 2022 Enhancement(s)  | The Company believes it has reached the right balance to ensure the safety of customers and their property through its background check and exception process.  |
| Determination of Success   | N/A   |
| <b>13. Reduce barriers to professional development, as well as entry into the energy efficiency workforce.</b> |   |
| Current Activity   | One of the Company's lead vendors is collaborating with the RI Builders Association, and their affiliate Residential Construction Workforce Partnership, on their new training program for weatherization in September 2021. The lead vendor's participation in these trainings will help ensure graduates are fully prepared to work in the Energy Efficiency Programs.  |
| 2022 Enhancement(s)  | <ol style="list-style-type: none"> <li>1. Complete a workforce development needs assessment modeled after, and building on, this report completed in MA: <a href="https://ma-eeac.org/wp-content/uploads/Massachusetts-Energy-Efficiency-Workforce-Development-FINAL-REPORT-CAREER-PROFILES.pdf">https://ma-eeac.org/wp-content/uploads/Massachusetts-Energy-Efficiency-Workforce-Development-FINAL-REPORT-CAREER-PROFILES.pdf</a>. Data from the needs assessment can be used to target future workforce development strategies, with diversity and upskilling of a diverse workforce as major areas of focus.</li> <li>2. Continue the lead vendor collaboration with the RI Builders Association, and their affiliate Residential Construction Workforce Partnership, to complete at least two additional Energy Efficiency Program related trainings in 2022. RI Builders Association will report participant demographic information to the Company from the September 2021 training. If necessary, the Company will assist in the targeted recruitment of more diverse trainees for 2022. During 2022, the Company and/or its vendors will also collaborate with the RI Dept of Human Services (DHS) on workforce development efforts from U.S. Department of Energy training funds. RI DHS will also report participant</li> </ol> |

|   |   |
|---|---|
|   | demographic information to the Company, so the Company can assist in the targeted recruitment of more diverse trainees, if necessary.   |
| Determination of Success  | <ol style="list-style-type: none"> <li>1. Completion of a RI workforce development needs assessment by December 2022.</li> <li>2. Collaboration with the RI Builders Association on two additional trainings in 2022.</li> <li>3. Completion of recruitment assistance to RI Builders Association and RI DHS, if necessary.</li> </ol>  |
| <b>14. Collaborate with local diverse community organizations to train and certify potential workers (Progreso Latino, Hispanic chamber of commerce, Cape Verdean community development).</b> |   |
| Current Activity  | The Company and its vendors currently collaborate with entities such as Skills for RI's Future; the University of RI's Energy Fellows program; and the RI Builders Association and their affiliate Residential Construction Workforce Partnership, for workforce development and training. Vendors and contractors also complete additional on-the-job training for upskilling. |
| 2022 Enhancement(s)   | See recommendation 13. The new workforce development needs assessment, as well as demographic reporting from the new trainings will help to determine whether new recruitment and upskilling efforts with a focus on diversity are necessary.   |
| Determination of Success  | N/A   |

The Company will provide updates on the implementation of these enhancements in Q2 and Q4 of the Company's 2022 Annual Energy Efficiency Quarterly Reports to the Public Utilities Commission. The EWG will continue to meet quarterly during 2022.

*2.5.2 Community-Based Initiative*

The Rhode Island Community-Based Initiative is designed to increase participation in the Rhode Island Energy Efficiency commercial and residential energy efficiency programs and elevate local energy priorities of a city or town. Cities and towns are selected to participate based on need, commitment from the city or town, and the desire for a community-based approach to efficiency. The Company and the municipality work to set pertinent community-based energy efficiency goals and align incentive dollars for achieving the goals. Success of the Initiative is driven by advocacy from elected officials and deep municipal engagement with residents and small businesses to achieve the established energy efficiency goals. Examples of possible energy efficiency programs through which goals are identified:

- EnergyWise Home Energy Assessments
- Income Eligible Energy Assessments – single family and multifamily
- Refrigerator Recycling
- Replacement of inefficient cooling units with high-efficiency heat pumps
- Small Business Direct Install Program
- Demand Response
- Other: measures that may be underrepresented within the community

The Company provides marketing toolkits and trainings to municipalities to empower staff to promote energy efficiency opportunities to their residents and small businesses. Frequent check-in calls allow the communities to speak with the Company regarding progress toward goals, as well as conveyance of best practices learned from other participating municipalities. The municipality promotes the Initiative through events, engagement of key businesses, and local communications. In 2022, the Company will also test energy efficiency program messaging through an insert in at least one participating city/town's water/sewer bill. At the end of the year, municipalities earn grant monies based on achieving the agreed upon energy efficiency goals. These grant monies are then utilized for energy saving projects on a municipal property, or on educational energy programs for community members.

In 2022, the emphasis for selecting the Cities to participate in the Program, in addition to energy efficiency, will include elements of equity and workforce development. This will be an important endeavor as COVID-19 greatly impacted the ability to engage with customers on the ground in the community in 2020 and 2021.

In the first quarter of 2022, the Company will recruit Rhode Island municipalities based on opportunities to increase residential and small business program participation. In addition, the Company will maintain a dedicated engagement with the Aquidneck Island community to provide continuity in the ongoing efficiency efforts in this region. As the Company has run this effort successfully since 2013, prior participating communities may again be invited to participate.

Wi-Fi Thermostats and active demand response opportunities will remain a focus as the Company strives to minimize energy peak demand. If such programs or efforts are part of a System Reliability Plan (SRP) initiative, then they would follow SRP considerations noted in Section 5.1 and be detailed in the System Reliability Plan. The initiative will continue to coordinate with the 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.

Building upon the community-based approach stated above, the Company will also continue the **Community Solutions Initiative**. This initiative targets geographic communities that encompass multiple towns, industrial and technology parks, and other organized communities such as industry groupings with common end uses (e.g., indoor agriculture). Community Solutions provides a single point of contact for a given community to access all available Company solutions, including energy efficiency, EVs, demand response, and emerging technologies.

Under this initiative, in 2020, quasi-public Quonset Development Corporation (QDC) signed a three-year memorandum of understanding with the Company to provide businesses at the Quonset industrial park in North Kingstown with access to enhanced incentives and technical services to identify and implement energy efficiency projects. In 2020, these businesses received more than \$2 million in incentives, resulting in savings of over 8 million kWh and 120,000 therms per year, valued at over \$1.4 million in cost savings. Participating customers range from small industrial businesses to some of the largest energy users in the state. In 2022, the Company will continue to provide energy-related trainings in collaboration with QDC to expand program participation.

### *2.5.3 Codes and Standards Support*

The Codes & Standards Technical Support Initiative (CSTS) develops and delivers technical guidance to a wide variety of stakeholders to support energy efficiency policies applicable to the state’s building sector. CSTS is a highly cost-effective initiative that unlocks sources of typically long-lived energy savings and primarily benefits historical nonparticipants and customer segments considered “hard to reach” (HTR) by raising efficiency baselines market wide. CSTS saves energy by: (1) increasing overall market compliance with current minimum energy efficiency codes and standards, and (2) increasing the level of energy efficiency required by such policies. The Company has successfully demonstrated both approaches with respect to building energy codes.

In 2022, the Company will continue to support RI energy code compliance and advancement. CSTS compliance support activities include training (classroom, webinar, and in-field), a “hotline” for project-specific inquiries, and development and delivery of tools and resources that help fill market gaps. CSTS has a broad reach, but our primary audiences are building code officials, design professionals (architects, engineers), and builders/developers/contractors. CSTS will also continue to support energy code advancement by developing and delivering proposals to strengthen the efficiency of the RI energy code. The Company will submit these proposals for consideration during the state’s 2021 International Energy Conservation Code (IECC) adoption process.

The Company also plans to extend these compliance and advancement support strategies to better support appliance and equipment standards. CSTS will pursue opportunities to provide technical guidance at the state and federal levels to advance appliance and equipment standards impacting RI energy consumption. At the state level, CSTS will provide technical guidance for product standards that have been adopted in other states but were excluded in RI's new package of product standards, such as air purifiers and high color rendering index (CRI) fluorescent lamps. In preparation for implementation of this new package of standards in 2023, CSTS will also coordinate with OER to investigate the opportunity to support compliance with these standards, and potentially federal appliance standards, through a similar approach to that currently employed for energy codes.

While active technical support of codes & standards aligns very well with stakeholder goals for this Plan – most notably Innovation/Diversification of programs, Cost-efficiency, and Equity – there is currently no agreed upon mechanism in place for the Company to claim savings for the energy savings resulting from any of the CSTS activities described in this section. This constrains the Company’s ability to pursue this promising opportunity to better align the portfolio with stakeholder goals. The Company will continue to

coordinate with stakeholders to develop a clear path to attribution or alternative means of receiving credit towards its savings goals for these activities. Reaching an agreement will both guide future CSTS activities and enable the Company to be compensated for services it is currently delivering in the absence of such mechanism. Upon completion of the state’s current building code update process, the Company will pursue compensation for code change proposals it developed and submitted in 2019 that were successfully incorporated into (and increase the energy saved by) the state’s new energy code. The Company will also pursue savings credit for the technical guidance it provided in support of the package of appliance and equipment standards adopted by the state in 2021. The state’s new energy code and product standards are both anticipated to produce material energy savings starting in 2023.

#### 2.5.4 Workforce Development

In 2022, the Company plans to maintain its historical workforce development investments (see Table 8) while also funding upskilling in specific areas where there is high confidence in delivering ratepayer benefits (see Table 9). These investments drive customer benefits by improving installation quality and increasing the industry’s capacity to install non-lighting measures in the near term while also accelerating industry adoption of the advanced controls and high-efficiency HVAC systems identified in the Market Potential Study as areas for growth.

The Company will also complete a Rhode Island Workforce Development Needs Assessment outlined in Attachment 3, Evaluation, Measurement, and Verification, to ensure future workforce development investments are preparing the present and future labor pool to meet the state’s energy efficiency goals.

Table 8 below shows continued workforce development activities, with 2022 budget levels providing a steady level of service compared to 2021. These efforts will be supplemented by sales and marketing focused training to program vendor/subcontractor sales and technical staff focused on promoting deeper savings measures to customers.

*Table 8 Continued Workforce Development Activities*

| Sector   | WFD activity              | Description  | Target audience                             | Estimated individuals reached | 2022 budget |
|----------|---------------------------|--|---|-------------------------------|-------------|
| Res      | HVAC Check trainings      | HVAC installation best practices training delivered as part of the HVAC program                                      | HVAC technicians                            | 70                            | \$39,400    |
| Res + IE | Zero Net Energy training  | High performance building best practices training delivered as part of the Residential New Construction program      | Design professionals builders / contractors | 200                           | \$20,000    |
| IE       | Miscellaneous IE training | Training on topics such as WiFi thermostats and ASHPs delivered as part of the Income Eligible Single Family program | Weatherization contractors, auditors        | 20                            | \$50,000    |



| Sector             | WFD activity                                 | Description   | Target audience   | Estimated individuals reached                        | 2022 budget |
|--------------------|--|---|---|--|-------------|
| <b>C&amp;I</b>     | Zero Net Energy training                     | High performance building best practices training delivered as part of the C&I New Construction and Major Renovations program   | Design professionals developers / contractors                             | 200  | \$20,000    |
| <b>C&amp;I</b>     | BOC training                                 | Building O&M best practices training delivered as part of the C&I Retrofit program  | Facility managers, building maintenance staff                             | 25   | \$37,000    |
| <b>All sectors</b> | Codes & Standards – code compliance training | A suite of services which includes training sessions (classroom, webinar, and in-field), project-specific “hotline” support, and development and delivery of tools and resources to fill industry gaps. | Code officials, design professionals, builders / developers / contractors | 500 (note: this only includes training participants) | \$200,000   |

Residential workforce development will focus on continued collaboration between the Company and its vendors with entities such as Skills for RI's Future; the University of RI's Energy Fellows program; and the RI Builders Association and their affiliate Residential Construction Workforce Partnership. To help ensure new trainees come from diverse backgrounds, RI Builders Association has agreed to report participant demographic information with the Company from a September 2021 weatherization training and, if necessary, the Company will assist in the targeted recruitment of more diverse trainees for two similar trainings in 2022. During 2022, the Company and/or its vendors will also collaborate with the RI Dept of Human Services (DHS) on workforce development efforts from U.S. Department of Energy training funds. RI DHS will also report participant demographic information to the Company, so the Company can assist in the targeted recruitment of more diverse trainees, if necessary.

Several additional workforce development activities focusing on upskilling the C&I program workforce have been added for 2022 as shown in Table 9. The new initiatives address workforce gaps in the following high-priority technology areas:

- Controls (Energy Management Systems (EMS), Building Automation Systems (BAS))
- Ventilation (Demand Controlled Ventilation (DCV), Energy Recovery Ventilators (ERV))
- Variable Frequency Drives (VFDs)
- HVAC
- Retro-commissioning (RCx)
- Lighting controls

Through this approach, the Company will upskill the local workforce to both improve installation quality of these measures and enable the transition to non-lighting measures highlighted by the Market Potential Study. The Company will also engage with other entities in recognition that these efforts fit within a larger workforce development ecosystem. As such, the Company will coordinate with the public and private entities comprising the RI energy efficiency workforce development network to help maximize impact and avoid duplication of efforts. For example, the Company will promote participation in trainings organized by the Residential Construction Workforce Partnership<sup>26</sup> such as the previously mentioned Residential Construction Pre-Apprentice Energy Weatherization Auditor, Installer & Performance Evaluator Training Program launching in 2021.

*Table 9. New Workforce Development Activities for 2022*

| Sector         | WFD activity  | Description  | Target audience  | Estimated individuals reached | 2022 budget |
|----------------|---|--|--|-------------------------------|-------------|
| <b>C&amp;I</b> | Controls Best Practices training (HVAC and Lighting Controls) | ASHRAE Guideline 36 training (Sequence of Operations)  | Contractors / engineers                                    | 40                            | \$20,000    |
|                |   | Lighting Design Lab (lighting controls) training   | Contractors / engineers, program technical and sales staff | 20                            | \$30,000    |
| <b>C&amp;I</b> | Manufacturer-led trainings                                    | The Company will coordinate and promote participation in existing manufacturer trainings in the following technology areas. <ul style="list-style-type: none"> <li>• Building / HVAC Controls (e.g. Johnson Controls BAS and HVAC training courses)</li> <li>• DCV and ERV (e.g. Trane Engineers Newsletter Live Series)</li> <li>• VFDs (e.g. Danfoss Drives training)</li> <li>• HVAC (e.g. Mitsubishi heat pump training)</li> <li>• Lighting Controls (e.g. Acuity wired lighting systems course)</li> </ul> |  | 100                           | \$50,000    |
| <b>C&amp;I</b> | Industry certifications                                       | The Company will increase number of local certified individuals by sponsoring certifications   |  | 125                           | \$125,000   |

26 <https://rcwpjobs.com/>

in the following technology areas; sub-bullets provide example certifications.

- Controls
  - ISA Building Automation Systems
  - BOMA Building Automation Systems Certificate
- HVAC
  - NATE Level 4
  - ASHRAE Certified HVAC Designer
- RCx
  - ASHRAE Building Commissioning Professional

## 2.6 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 2022, 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 10. Participation Definitions*

| Fuel       | Sector                      | Program                                  | Participation Unit     |
|------------|-----------------------------|--|------------------------|
| <b>Gas</b> | 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          |

| Fuel     | Sector                      | Program  | Participation Unit  |
|----------|-----------------------------|--|---|
|          |                             | 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   |
|          |                             | 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® 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 2022. This method allows for a better estimation of unique participants but can make it more difficult to compare planned numbers across years.

In 2022, 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 2012-2020 the Company served approximately 60% of its electric customers and 31% of its gas customers from its

targeted programs at least once (this analysis has removed duplicate participation across programs and across years from 2012-2020). When Home Energy Reports and C&I upstream lighting participation are added to these counts, a total of 90% of electric customers and 91% 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 In the 2022 Year-End report, the Company will remove any participation overlap to report unique 2022 participants. See 2020 Year-end Report for further details on participation through 2020.

In 2022, 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 2022 Year-End Report showing additive and cumulative portfolio participation.

### 3 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.”<sup>27</sup> 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.

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<sup>27</sup> Docket 4600-A PUC Guidance Document, October 27, 2017. Section V. Pilots.

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. 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.

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. The Company anticipates that calendar year 2022 will be the last year in which the gas demand response pilot is included as a pilot offering. The Company will assess the viability of this approach to meeting capacity constraints as part of Non-Pipeline Alternative (NPA) program development that is underway through the Company's SRP pathway.

## 4 Evaluation Measurement and Verification Plan

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.

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 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 2010 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<sup>28</sup>, or upon request.

Additionally, the EM&V Plan for 2022 is presented in Attachment 3 and includes brief descriptions of each of the proposed studies. The areas proposed for study in 2022 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. This list may be added to as the year progresses and different evaluation priorities are identified. In particular, the Company 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.

The Energy Efficiency Program Evaluation Study, conducted by a third-party vendor hired by OER, was completed in 2021. The EM&V Plan for 2022 is responsive to the recommendations of that study; further details can be found in Attachment 3, Section 6.

## 5 Coordination with Other Energy Policies and Programs

Continuing to provide the best value to Rhode Island customers necessitates that the Company coordinate with other parts of the energy system, rather than pursuing savings programs and strategies in isolation. In 2022 the Company will continue to seek ways to implement the energy efficiency portfolio of programs in coordination with other Company filings and activities, described below. Efforts have also been taken to ensure the 2022 Annual Plan is aligned with relevant state policies and objectives, with specific coordination opportunities detailed below.

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<sup>28</sup> <https://rieermc.ri.gov/plans-reports/evaluation-studies/>

## 5.1 System Reliability Procurement

During the 2022 program year, the Company's energy efficiency programs will continue their longstanding coordination with SRP plans and filings, including the development of the Non-Pipelines Alternative (NPA) program within the SRP pathway. Energy efficiency, among other demand side management solutions, has potential to be a component to meet a variety of situations in which NWA and NPAs are considered. SRP filings will continue to be made separately from the energy efficiency filings while any charge associated with SRP will be accounted for in the energy efficiency charge. One opportunity for 2022 will be to test location-targeted marketing in heavily loaded feeder areas.

## 5.2 Advanced Metering Functionality (AMF), Grid Modernization (Grid Mod), Rate Cases, Renewables

On January 21, 2021, the Company filed its proposed Grid Modernization Plan and Updated Advanced Metering Functionality Business Case in RI PUC Docket 5114<sup>29</sup> and 5113<sup>30</sup>, respectively. As of the date of this Plan, the RI PUC has stayed both dockets pending further consideration following the issuance of a final Order in Division Docket No. D-21-09, Petition for Authority to Transfer Ownership of the Narragansett Electric Company to PPL Rhode Island Holdings, LLC, Petition of PPL Corporation, PPL Rhode Island Holdings, LLC, National Grid USA, and the Narragansett Electric Company.<sup>31</sup> The teams working on the energy efficiency programs, Grid Mod, and AMF will continue to 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 investments 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 Energy Efficiency team will continue to coordinate with the GMP and AMF teams 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

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<sup>29</sup> In re: The Narragansett Electric Company d/b/a National Grid – Grid Modernization Plan. RI PUC Docket 5114: <http://www.ripuc.ri.gov/eventsactions/docket/5114page.html>

<sup>30</sup> In re: The Narragansett Electric Company d/b/a National Grid – Updated Advanced Metering Functionality Business Case. RI PUC Docket 5113: <http://www.ripuc.ri.gov/eventsactions/docket/5113page.html>

<sup>31</sup> RI PUC Docket 5113, Order 24089: [http://www.ripuc.ri.gov/eventsactions/docket/5113-5114-NGrid-Ord24089%20\(7-14-2021\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/5113-5114-NGrid-Ord24089%20(7-14-2021).pdf):



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 the 2022 Annual Plan is implemented. 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 stakeholders to ensure all are aware of any future transition.

### 5.3 Act on Climate

The Act on Climate Legislation was signed into law by Governor McKee in April 2021. This legislation accelerates the timeline of legislated GHG reductions in RI and mandates the specified reduction levels. Specifically, 10% below 1990 levels by 2020; 45% below 1990 levels by 2030 (previously 2035); 80% below 1990 levels by 2040 (previously 2050); and net-zero emissions by 2050 (new). Moving forward, the Company's energy efficiency programs will continue to set energy reduction goals that contribute to these statewide GHG emissions reduction targets and will report GHG emissions reductions in quarterly and annual reports, consistent with the 2021 Annual Plan.

#### 5.3.1 *Electrification, Heat Pumps, and Delivered Fuel Policy and Objectives*

The Company plans to continue to offer enhanced incentives for customers installing heat pumps using allocated RGGI funds from OER, to the degree that those funds extend into 2022. At this time the Company does not have visibility to a direct regulatory pathway to the promotion of electrification for delivered fuel customers by way of electric or gas system benefit charge collections.

### 5.4 Codes and Standards Program and Accounting for New Codes and Standards

With an update to the state energy code (to the 2018 International Energy Conservation Code (IECC)) projected in early 2022, savings opportunity will be reduced due to rising baselines.

## 6 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.

## 6.1 Combined Heat and Power

**Combined Heat and Power:** The Company is currently working with a customer that is pursuing an energy efficiency incentive for a 13.3 megawatt combined heat and power system that would provide electricity, hot water, and CO<sub>2</sub> to their facility. The unique design of this CHP will allow the customer to capture the CO<sub>2</sub> from the CHP system and use the gas for their business operation. The CO<sub>2</sub> harvesting will substantially reduce the environmental emissions from the CHP plant, while also reducing or eliminating the customers' need to purchase CO<sub>2</sub> for their horticulture operation. The incentive cost per unit of energy is expected to be below \$0.03 per lifetime kWh, making the project one of the most cost-efficient offerings in the energy efficiency portfolio. The project is expected to be operational by late 2022, pending PUC approval. Should this project not be approved by the PUC, funds for this project would be reallocated to other measures in the C&I portfolio, potentially at a higher cost per unit energy. A minimum of 20% of the energy efficiency incentive payment will be held until commissioning is complete, anticipated in 2023.<sup>32</sup> In the event the PUC disallows the energy efficiency funding for the CHP project, the Company will perform additional analysis in a Provisional Plan to determine how the CHP funding should be reallocated within the C&I portfolio.

*Table 11. Planned CHP Project Details*

| CHP Nameplate Capacity | 2022                     |                            |                   | 2023                     |                            |                   |
|------------------------|--------------------------|----------------------------|-------------------|--------------------------|----------------------------|-------------------|
|                        | Net Annual Savings (MWH) | Net Lifetime Savings (MWH) | Incentive Payment | Net Annual Savings (MWH) | Net Lifetime Savings (MWH) | Incentive Payment |
| 13.3 MW                | 15,578                   | 311,562                    | \$9,154,400       | 3,895                    | 77,891                     | \$2,288,600       |

### 6.1.1 Provisional Plan

The 2022 Annual Energy Efficiency Plan (Plan) includes \$9,154,400 in incentives for the RI Grows combined heat and power (CHP) project. The project would provide electricity, heat, and carbon dioxide capture at the local Shattuck Farm tomato growth facility. This project offers the greatest savings per unit of incentive budget of any electric measure. Furthermore, the Plan has a higher total Benefit-Cost Ratio (BCR) with RI Grows than without it, regardless of whether economic multipliers are applied.

As a supplement to the Plan, the Public Utility Commission (PUC or Commission) requested that the Company file a Provisional Plan in the case that funding for the RI Grows project is not approved. This

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<sup>32</sup> R.I.Gen.Laws §39-1-27.7(c) (6) (iii) directs the Company to support the development of combined heat and power. The law requires that the following criteria be factored into the Company's Plan: economic development benefits in Rhode Island, energy and cost savings for customers, energy supply cost, greenhouse gas emissions standards and air quality benefits, and system reliability benefits. For CHP projects above 3 MW in size, the Company will determine the economic development benefits by running a Regional Economic Models Inc (REMI) analysis using project-specific values in accordance with the recommended methodology from the Battle Group study.

Provisional Plan provides an alternative savings target based on a reallocation of funds from the CHP project to other cost-effective measures.

Both the Plan and Provisional Plan have approximately the same total budget, as they each maintain a 5% maximum budget increase compared to the 2021 plan. This 5% increase aligns with the Commission’s guidance in its Report and Order on Docket No. 5076<sup>33</sup>. The Order notes, “the bar is very high for the utility to obtain approval of a budget that is higher than the non-binding 5% target and the Commission needs to be satisfied that such an increase is in the best interest of ratepayers. In that regard, the starting point for consideration of a higher budget needs to be founded upon evidence that facts or other information presented at the time when the PUC set the target have since changed.”<sup>34</sup>

Although the Company believes the Provisional Plan offers cost-effective savings, this scenario captures substantially less cost-efficient savings than the Plan. This is because the initial Plan includes the most cost-efficient mix of spending; any additional spending will generally produce marginally less savings. In the Provisional Plan, the RI Grows budget will be allocated to Commercial and Industrial (C&I) incentives.

- A portion will also be allocated to the Sales, Technical Assistance, and Training (STAT) budget to support these additional projects. In particular, HVAC, controls, and other non-lighting projects tend to be more complex, varied, and resource intensive than lighting projects. Thus, STAT funds have been added to provide additional technical and account management support.
- The Provisional Plan also includes a vendor-driven early retirement program to encourage early replacement of heating, cooling, and ventilation (HVAC) equipment; this is similar to an initiative proposed by the EERMC Consultant Team.<sup>35</sup>

## CONSISTENCY WITH STANDARDS

### 7 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,

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<sup>33</sup> Refer to PUC Report and Order No. 24225; written order issued on September 21, 2021 for final guidance on 5% budget target. [http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20\(9-21-2021\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20(9-21-2021).pdf).

<sup>34</sup> Refer to Bates page 47, Order No. 24225; written order issued on September 21, 2021. [http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20\(9-21-2021\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20(9-21-2021).pdf).

<sup>35</sup> EERMC Consultant Team Memo. Subject: “2022 Energy Efficiency Plan Final Draft Review.” September 14, 2021.

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.

## 7.1 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 it 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.

### 7.1.1 *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 1.64 and the gas portfolio achieves a BC Ratio of 2.76. These calculations conservatively do not include Economic Development benefits because of concerns about double counting. Were these benefits included, the BC Ratios would be 3.51 for the electric portfolio and 3.72 for the gas portfolio. In addition, there are some qualitative benefits, such as societal public health benefits that would likely increase benefit cost ratios were they to be calculated.

Furthermore, the cost of procuring 1,145,371 MWh lifetime electric energy efficiency savings through the Plan is \$62.1 million less than if that electric load was met by purchasing additional electric supply. The cost of procuring 4,059,902 MMBtu lifetime natural gas energy efficiency savings through the Plan is \$18.9 million less than if that natural gas load was met by purchasing additional natural gas supply.

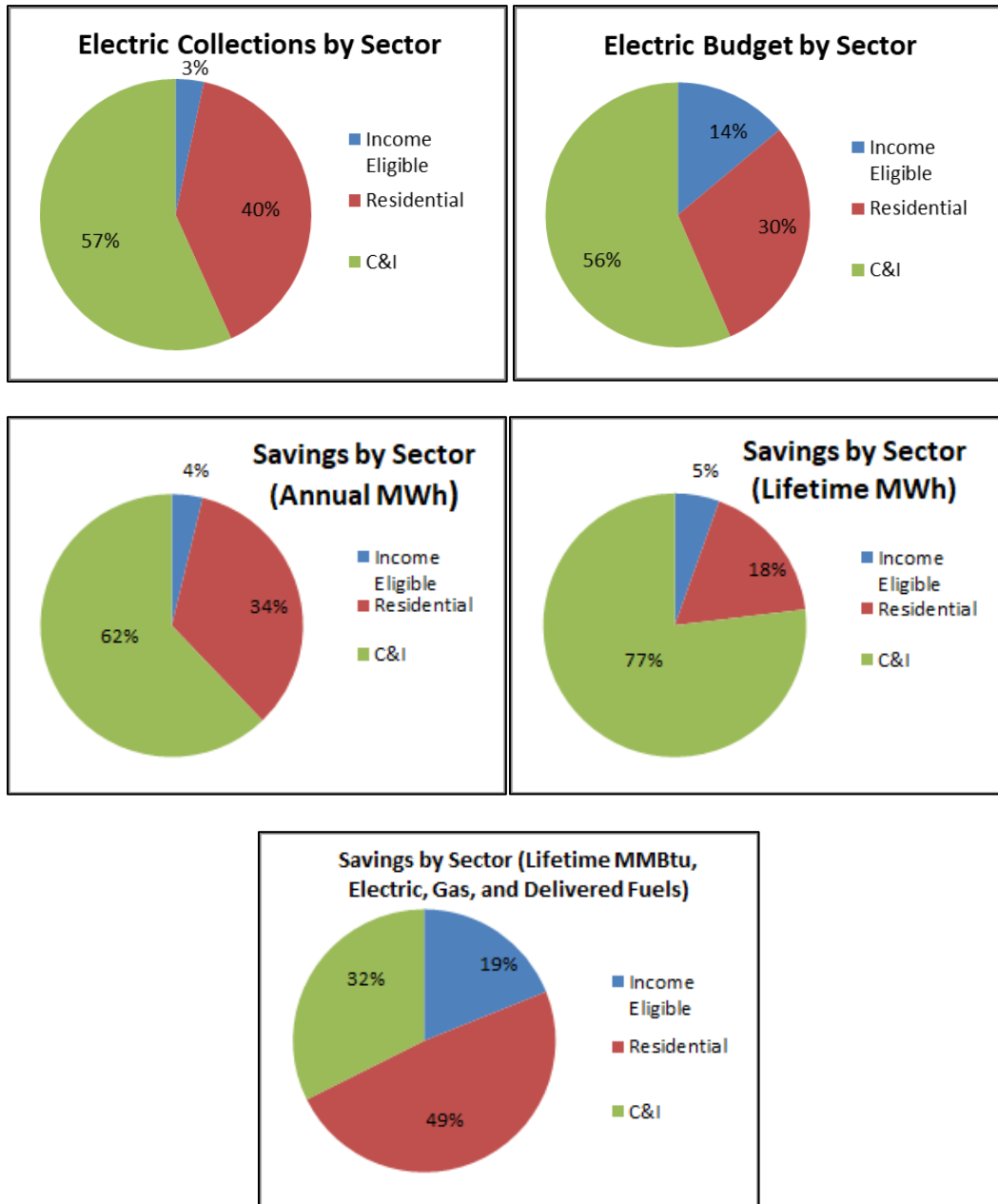
### *7.1.2 Equity*

Refer to Section 2.5.1 for equity enhancements to the 2022 Plan. The Participation and Multifamily Census Study, as well as the Nonparticipant Market Barriers Study will be completed in 2022 and will provide valuable data to inform strategies for making the energy efficiency programs more equitable. The Participant study relies on existing National Grid data to develop profiles for participants of National Grid programs, including multi-family building characteristics and an indicator of whether each building has participated in a National Grid efficiency program. The Nonparticipant Market Barriers Study is designed to provide in-depth research to characterize customers that have not participated in the residential or income eligible programs, assess barriers to their participation, and identify opportunities to engage these customers. These studies, together with the recommendations offered by the Equity Working Group launched in 2021, provide insights for equity-related enhancements in program planning, design and implementation. National Grid has used all available information to achieve greater equity in the programs and will continue to improve and evolve its efforts as new data and guidance becomes available.

### *7.1.3 Parity Among Sectors*

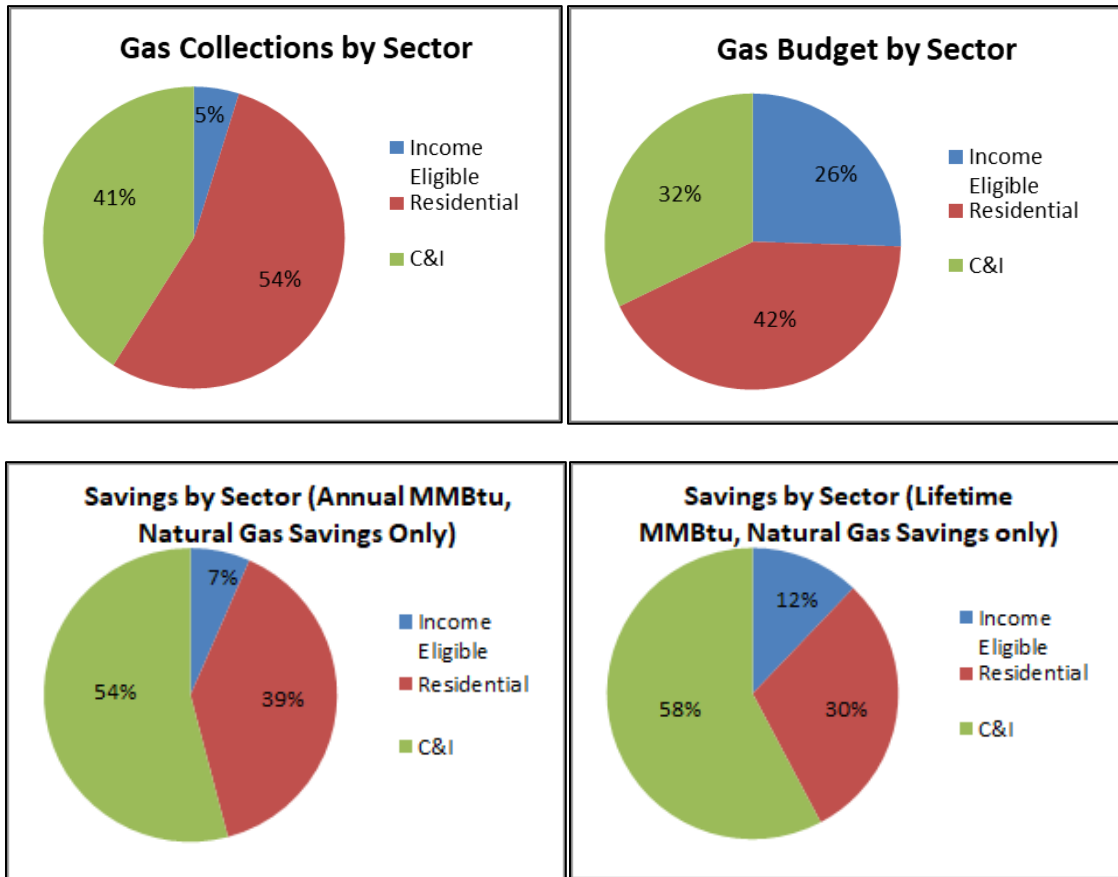
In considering the prudence of the set of proposed investments contained in this Plan, the Company has also assessed the parity among sectors along dimensions of collections, budgets, and savings. As shown in Figure 3, there is approximate parity between the collections by a customer class and its resulting budget and savings in the electric portfolio. The only exception is the income-eligible sector where 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). \$26.4 million is budgeted for the delivery of the gas and electric income eligible sector programs, 26% and 14% of the total funding for each fuel portfolio respectively in 2021. Taken together, these investments represent 16.8% of the overall electric and gas portfolio budgets. More information on the services offered through the income eligible sector programs can be found in Attachment 1 Residential & IES Programs.

Figure 3. 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 4. 2021 Graphical representation of Attachment 6 Table G-1 and total Gas Savings by Sector, Cumulative



#### 7.1.4 Rate and Bill Impacts

In accordance with the LCP Standards, the Company has assessed the rate and bill impacts of the proposed portfolios.

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.

Electric programs are projected to generate slight upward movement on long term rates between 0.32% and 0.59%. For both residential and C&I participants, modeling shows a reduction in bills between 2.57% and 8.57%.

Natural gas programs are projected to generate slight upward movement on long term rates between 0.33% and 0.77%. For the income eligible customer participants, the Small C&I participants, and Large C&I participants, modeling shows a reduction in bills between 2.61% and 23.55%.

With respect to the residential sectors in both electric and natural gas, the Company used three distinct model instances to evaluate rate and bill impacts. The three residential model instances explored 1) the Home Energy Reports (HER) program in isolation, 2) all programs – including the *EnergyWise*, *EnergyStar* HVAC, *EnergyWise* Multifamily, Residential New Construction – without HER, and 3) all programs together. Notably, each division of the residential sector analysis has been developed using a separate instance of the rate and bill impacts model. Additionally, on the electric side, income eligible has been separated from market rate residential. Attachment 7 provides additional detail on this modeling approach.

Relative to the other 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, however, is a fair amount longer than the persistence of the HER program measure life (20 years for electric and 24 years for gas). Consequently, the model instance analyzing the HER program in isolation provides savings over a much shorter period of time compared to 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 (Model 1), average participants see a reduction in bills of on average 0.05% for residential electric, 0.05% for income eligible electric, and 0.01% for gas. These results can largely be attributed to the relatively short duration of savings from this program. When all other residential programs except HERs are considered together (Model 2), average participants see 5.60%, 7.17%, and 4.72% reductions in average bills for electric residential, electric income eligible, and gas customers respectively. Lastly, when all residential programs are considered together (Model 3), long-term average changes in bills are negative for electric residential (-5.47%) and electric income eligible (-6.74%), and very slightly positive for gas (0.15%). As discussed in more detail in 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 12 and Table 13 summarize the results of the electric and natural gas rate and bill analyses for the 2022 proposed programs, respectively. All electric sectors see slight increases in long term rates. With the exception of residential (all programs w/o HERs and all programs), average electric customers see small decreases in overall bills. All participant electric customers see decrease in their long-term bills. All gas sectors see a slight increase in long term rates due to their participation. With the exception of the Income Eligible sector, the average gas customer sees a small increase in long term bills. On the other hand, the average gas participant experiences a reduction in long term bills across all sectors.



Table 12: Rate and Bill Impact Results for the Electric Portfolio

| Sector  | Levelized net change in rates due to 2022 Programs | Long Term Average Change in Bills |                  |                     |
|---|--|-----------------------------------|------------------|---------------------|
|   |  | Non-Participants                  | Average Customer | Average Participant |
| Residential (Model 1: HERs only)                    | 0.01%  | 0.01%                             | -0.03%           | -0.05%              |
| Residential (Model 2: All Programs Except HERs)     | 0.31%  | 0.31%                             | 0.05%            | -5.60%              |
| Residential (Model 3: All Programs)                 | 0.30%  | 0.30%                             | -0.02%           | -5.50%              |
| Income Eligible (Model 1: HERs only)                | 0.01%  | 0.01%                             | -0.04%           | -0.05%              |
| Income Eligible (Model 2: All Programs Except HERs) | 0.55%  | 0.55%                             | -0.96%           | -7.16%              |
| Income Eligible (Model 3: All Programs)             | 0.59%  | 0.59%                             | -0.97%           | -6.74%              |
| Small C&I   | 0.41%  | 0.41%                             | -0.42%           | -8.57%              |
| Medium C&I  | 0.28%  | 0.28%                             | -0.53%           | -5.01%              |
| Large C&I   | 0.21%  | 0.21%                             | -1.00%           | -2.57%              |

Table 13: Rate and Bill Impact Results for the Natural Gas Portfolio

| Sector  | Levelized net change in rates due to 2022 Programs | Long Term Average Change in Bills |                  |                     |
|---|--|-----------------------------------|------------------|---------------------|
|   |  | Non-Participants                  | Average Customer | Average Participant |
| Residential (Model 1: HERs only)                | 0.02%  | 0.02%                             | 0.00%            | -0.01%              |
| Residential (Model 2: All Programs Except HERs) | 0.47%  | 0.46%                             | 0.26%            | -4.72%              |
| Residential (Model 3: All Programs)             | 0.49%  | 0.48%                             | 0.25%            | 0.15%               |
| Income Eligible                                 | 0.77%  | 0.77%                             | -0.17%           | -4.28%              |
| Small C&I                                       | 0.33%  | 0.32%                             | 0.19%            | -23.55%             |
| Large C&I                                       | 0.48%  | 0.47%                             | 0.02%            | -2.61%              |

The Company also includes an assessment of the Year-over-Year change in rates from 2021 to 2022 driven by the funding plan and budgets discussed later in this Plan. In developing the proposed level of investment in this plan, the Company considered the PUC’s commentary and rulings at the December 22, 2020 and August 11, 2021 open meetings during which the PUC indicated support for budget

increases of up to 5 percent for years 2022 and 2023 in the Three-Year Plan.<sup>36</sup> The Company has steered based on these rulings as an indicator of prudence in development of the subsequent 2022 Annual Plan coupled with broader impacts of the plan as a whole. While the overall budget growth proposed in this plan is approximately a 5% increase above the budget level approved in the 2021 Annual Plan, several factors contribute to the growth in the energy efficiency charges exceeding 5%. These factors, which were projected in the indicative energy efficiency charges set forth in the Company’s compliance filing dated January 29, 2021, include the budget levels, other sources of funding, fund balances, and anticipated electric loads and natural gas sales. These elements are discussed further in Section 10 of this Plan. Table 14 summarizes the changes in rates based on the E-1 and G-1 tables.

*Table 14. Summary of Changes in Rates between 2021 and 2022*

| Rate Category                         | 2021    | 2022    | 2021 - 2022 Growth |
|---------------------------------------|---------|---------|--------------------|
| <b>Gas Residential SBC (\$/therm)</b> | 0.0871  | 0.1221  | 40%                |
| <b>Gas C&amp;I SBC (\$/therm)</b>     | 0.0596  | 0.0836  | 40%                |
| <b>Electric SBC (\$/kWh)</b>          | 0.01113 | 0.01425 | 28%                |

## 7.2 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.

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 4, 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,

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<sup>36</sup> PUC’s guidance on 5% budget target confirmed in Order No. 24225, written order issued on September 21, 2021. [http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20\(9-21-2021\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20(9-21-2021).pdf).

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 meet the high standards for participation in the ISO-NE FCM.

### 7.3 Environmentally Responsible

The energy efficiency programs and portfolios described in the Annual Plan are environmentally responsible. As detailed in Section 5.3, the recently passed Act on Climate stipulates aggressive, mandatory, and time-bound emissions reductions for the state. This Annual Plan seeks to continue the progress that has been made in reducing emissions by providing customers across all sectors with ways to reduce their energy consumption. Energy efficiency can therefore contribute directly to meeting the Act on Climate's goals. In addition to direct emissions reductions benefits, energy efficiency investments 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 other state environmental policy goals and initiatives.

#### 7.3.1 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 608,736 tons of Carbon Dioxide. The non-embedded values of CO<sub>2</sub> and NO<sub>x</sub> benefits generated by the 2022 annual plan over the lifetime of the measures are \$71,932,048 and \$2,872,086, respectively. These monetized values of non-embedded emissions are included as benefit streams in the RI Test benefit-cost assessment and in the assessment of cost of supply for the portfolio.

#### 7.3.2 Support for an Environmentally Responsible Local Jobs Infrastructure

In 2020, the Company's Energy Efficiency programs directly supported 827.5 FTEs, as determined by an assessment of the programs' impact in the 2022 Annual Report. 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. As noted in Section 2.5.4 this Annual Plan includes several activities designed to support upskilling of the green workforce.

### *7.3.3 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, *EnergyWise* 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.

## 7.4 Cost Effectiveness

The Company has analyzed the cost-effectiveness for the proposed 2022 portfolio and programs using the RI Test as required by Docket 4600<sup>37</sup> and the LCP Standards.<sup>38</sup> The RI Test compares the present value of the total lifetime benefits derived from efficiency savings to the total costs of acquiring those savings (i.e., program and customers’ costs). According to the Standards, “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. 4600, qualitative benefits and costs may be considered in determining cost-effectiveness. The portfolio must be cost-effective and programs must be cost-effective.” The portfolio and programs proposed for 2022 satisfy these criteria for cost-effectiveness.

As provided for in the Docket 4600 RI Test Framework, 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<sub>x</sub> 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 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. The RI Test as

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<sup>37</sup> RI PUC Docket 4600, <http://www.ripuc.ri.gov/eventsactions/docket/4600page.html>

<sup>38</sup> RI PUC Docket 5015, LCP Standards

[http://www.ripuc.ri.gov/eventsactions/docket/5015\\_LCP\\_Standards\\_05\\_28\\_2020\\_8.21.2020%20Clean%20Copy%20FINAL.pdf](http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf)

applied to the 2022 Annual Plan utilizes the recently completed regional avoided cost study, referred to as AESC 2021, completed by Synapse Energy Economics as an update and replacement of the AESC 2018 Study that provided the monetization of most benefit categories in the 2019 – 2021 Annual Plans and the 2021 – 2023 Three-Year Plan. The monetization of benefits also incorporates the latest EM&V results that affect claimable savings in the programs. Attachment 4 provides additional detail on changes in the avoided costs.

Attachment 5 Electric EE Program Tables, Table E-5 and Attachment 6 Gas EE Program Tables, Table G-5 provide the calculations of 2022 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 2021.

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 1.64 in the primary presentation of BCR results, which means that approximately \$1.64 in monetized lifetime 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 2.74 in the primary presentation of BCR results, which means that \$2.74 in lifetime benefits is expected to be created for each \$1 spent on the portfolio.

Table 15 and Table 16 below show the results of the RI Test at program, sector, and portfolio level. Notably, these tables compare the RI Test results without economic benefits and with economic benefits included using the multipliers as applied in the past two annual plans. The rationale for omitting quantified economic benefits from the primary presentation of BCR results as a conservative approach to avoiding double counting is described in additional detail in Attachment 4. While the removal of macroeconomic benefits from the calculation of the Primary RI Test results in lower benefit-cost ratios, all programs and portfolios still achieve benefit-cost ratios of at least 1.00. In addition, the RI Test and the Docket 4600 Framework guidance also indicate that categories of the Framework can be considered qualitatively in the assessment of cost effectiveness. When considering the significant economic activity generated directly by the programs, including supporting 827 FTEs associated with the programs and more than 1,000 companies involved, as well as non-quantified benefits, a reasonable assumption is that the macroeconomic benefits of the programs are positive and potentially significant and were those benefits included in the Primary RI Test screening as quantified benefits the programs would achieve more favorable benefit-cost ratios.<sup>39</sup>

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<sup>39</sup> Refer to the 2020 Year End Report for additional details on the assessment of FTEs and companies associated with the programs. [http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-Year-End%20Report%202020%20\(PUC%205-3-21\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/4979-NGrid-Year-End%20Report%202020%20(PUC%205-3-21).pdf)

Table 15. Electric Benefit Cost Ratios at Program, Sector, and Portfolio Level

| Electric Sector and Program                       | Primary RI Test without Quantified Economic Benefits | Secondary RI Test with Quantified Macroeconomic Benefits |
|---|--|--|
| <b>Large Commercial &amp; Industrial Programs</b> |  |  |
| Commercial New Construction                       | 1.87   | 3.64   |
| Commercial Retrofit                               | 2.20   | 6.59   |
| Small Business Direct Install                     | 1.16   | 2.78   |
| Commercial Connected Solutions                    | 2.42   | 4.61   |
| Commercial and Industrial Subtotal                | <b>1.76</b>  | <b>4.44</b>  |
| <b>Income Eligible Programs</b>                   |  |  |
| Income Eligible Single Family                     | 1.94   | 2.80   |
| Income Eligible Multifamily                       | 2.37   | 3.56   |
| Income Eligible Subtotal                          | <b>2.03</b>  | <b>2.96</b>  |
| <b>Residential Programs</b>                       |  |  |
| Residential New Construction                      | 2.03   | 3.06   |
| EnergyStar® HVAC                                  | 2.31   | 3.32   |
| EnergyWise  | 1.02   | 1.92   |
| Multifamily                                       | 1.63   | 2.78   |
| Home Energy Reports                               | 2.04   | 3.04   |
| EnergyStar® Lighting <sup>40</sup>                | N/A  | N/A  |
| Residential Consumer Products                     | 2.19   | 3.16   |
| Residential Connected Solutions                   | 1.60   | 2.43   |
| Non-Income Eligible Residential Subtotal          | <b>1.57</b>  | <b>2.51</b>  |
| <b>Electric Portfolio</b>                         | <b>1.64</b>  | <b>3.50</b>  |

Table 16. Natural Gas Benefit Cost Ratios at Program, Sector, and Portfolio Level

| Gas Sector and Program                            | Primary RI Test without Quantified Economic Benefits | Secondary RI Test with Quantified Economic Benefits |
|---|--|---|
| <b>Large Commercial &amp; Industrial Programs</b> |  |   |
| Large Commercial New Construction                 | 5.52   | 6.84  |
| Large Commercial Retrofit                         | 5.20   | 6.78  |
| Small Business Direct Install                     | 3.95   | 5.40  |
| Commercial & Industrial Multifamily               | 5.86   | 7.60  |
| Commercial & Industrial Subtotal                  | <b>4.56</b>  | <b>5.87</b>   |
| <b>Income Eligible Programs</b>                   |  |   |
| Single Family - Income Eligible Services          | 2.04   | 3.03  |
| Income Eligible Multifamily                       | 5.98   | 7.53  |

<sup>40</sup> Program discontinued for 2022.

| Gas Sector and Program                   | Primary RI Test without Quantified Economic Benefits | Secondary RI Test with Quantified Economic Benefits |
|--|--|---|
| Income Eligible Residential Subtotal     | <b>3.28</b>  | <b>4.45</b>   |
| <b>Residential Programs</b>              |  |   |
| EnergyStar® HVAC                         | 1.00   | 1.41  |
| EnergyWise                               | 1.13   | 2.06  |
| Multifamily                              | 3.45   | 4.77  |
| Home Energy Reports                      | 3.87   | 4.93  |
| Residential New Construction             | 1.62   | 1.73  |
| Non-Income Eligible Residential Subtotal | <b>1.36</b>  | <b>2.09</b>   |
| <b>Portfolio</b>                         | <b>2.74</b>  | <b>3.72</b>   |

## 7.5 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 2021 Plan.

Based on the Company’s calculation, the total cost of energy efficiency for the electric portfolio is \$143.2 million and the total cost of electric supply to meet the same need would be \$205.3 million. This is a total savings of \$62.1 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 \$45.3 million and the total cost of natural gas supply to meet the same need would be \$64.2 million. This is a total savings of \$18.9 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: 2021 Report” prepared by Synapse Energy Economics for the AESC 2021 Study Group, May 14, 2021. 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 17 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 17. List of the Costs of Energy Efficiency and Costs of Energy Supply*

| <b>Costs of Energy Efficiency</b> |                       |  |
|-----------------------------------|-----------------------|--|
| <b>Cost</b>                       | <b>Included (Y/N)</b> | <b>Explanation</b>   |
| 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.                  |

| <b>Costs of Energy Supply</b>        |                       |  |
|--------------------------------------|-----------------------|--|
| <b>Cost</b>                          | <b>Included (Y/N)</b> | <b>Explanation</b>   |
| 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. Note that this benefit is treated as a secondary benefit in the RI Test.   |
| 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 electricity, 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 2022 Plan occur only in 2022 and are therefore not discounted.

## FUNDING PLAN, BUDGET AND GOALS

### 8 Savings Goals

In 2022, the Company will primarily measure performance based on lifetime energy savings. 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. Lifetime energy savings units align with the energy savings Targets as set by the EERMC, and approved by the PUC, in Docket 5023.<sup>41</sup>

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<sup>41</sup> RI PUC Docket 5023, <http://www.ripuc.ri.gov/eventsactions/docket/5023page.html>

## 8.1 Electric Portfolio Savings Goals

Continuing from 2021, 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 12.

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.<sup>42</sup> 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*

$$MMBtu_{Electric} = MWh_{Electric} \times 3.412 \text{ MMBtu/MWh}$$

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*

$$MMBtu_{All \text{ Fuel}} = MMBtu_{Electric} + MMBtu_{Natural \text{ Gas}} + MMBtu_{Delivered \text{ Fuels}}$$

## 8.2 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.

## 9 Annual Plan Compared to the Three-Year Plan

The energy and cost savings for the 2022 program year are consistent with the objectives and requirements of Least Cost Procurement.

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<sup>42</sup> 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](https://www.eia.gov/totalenergy/data/monthly/pdf/sec13_7.pdf)

Table 18. Comparison of 2022 Electric Portfolio in Three-Year Plan Compliance Filing and 2022 Annual Plan

| Electric Portfolio                     | 2022 in 3YP Compliance Filing | 2022 Annual Plan | % Change |
|--|-------------------------------|------------------|----------|
| Net Annual Savings (MWh)               | 129,302                       | 127,561          | -1.3%    |
| Net Lifetime Savings (MWh)             | 1,379,789                     | 1,145,371        | -17.0%   |
| Total Benefits (RI Test) <sup>43</sup> | \$288,032,158                 | \$234,620,105    | -18.5%   |
| Total Budget                           | \$122,625,209                 | \$122,616,460    | 0.0%     |
| Benefit Cost Ratio (RI Test)           | 2.01                          | 1.64             | -18.1%   |
| Cost/Lifetime kWh                      | \$ 0.100                      | \$0.120          | 20.3%    |
| EE Program Charge per kWh              | \$ 0.01616                    | \$0.01425        | -11.8%   |

Table 19. Comparison of 2022 Gas Portfolio in Three-Year Plan Compliance Filing and 2022 Annual Plan

| Gas Portfolio                         | 2022 in 3YP Compliance Filing | 2022 Annual Plan | % Change |
|---------------------------------------|-------------------------------|------------------|----------|
| Net Annual Savings (MMBtu)            | 427,504                       | 389,430          | -8.9%    |
| Net Lifetime Savings (MMBtu)          | 4,278,262                     | 4,059,902        | -5.1%    |
| Total Benefits (RI Test)              | \$98,919,527                  | 124,048,699      | 25.4%    |
| Total Budget                          | \$36,723,443                  | \$36,723,364     | 0.0%     |
| Benefit Cost Ratio (RI Test)          | 2.12                          | 2.74             | 29.3%    |
| Cost/Lifetime MMBtu                   | \$10.53                       | \$10.74          | 2.0%     |
| C&I EE Program Charge per Dth         | \$0.773                       | \$0.836          | 8.2%     |
| Residential EE Program Charge per Dth | \$1.109                       | \$1.221          | 10.1%    |

The Company has proposed goals consistent with Least Cost Procurement, however there are some notable differences between the goals proposed in the 2022 Annual Plan and the Three-Year Plan Compliance Filing. First, the electric net lifetime energy savings goal is decreasing by 17%. This is mainly driven by evaluation results which significantly reduced the measure lives, and claimable lifetime energy savings, of Commercial and Industrial (C&I) lighting measures.<sup>44</sup> C&I lighting energy savings contributed to approximately 619,528 net lifetime MWh (45%) of the electric portfolio's net lifetime target for 2022 in the 2021-2023 Compliance Filing. In the 2022 Annual Plan, C&I lighting energy savings contributed to approximately 324,711 net lifetime MWh (28%) of the electric portfolio's net lifetime goal for the 2022

<sup>43</sup> 2022 Total Benefits in the Three-Year Plan included monetized economic benefits. In this table total benefit have been updated to exclude monetized economic benefits. For the 2022 in 3YP Compliance Filing, this resulted in a reduction of total electric benefits from \$564M to \$288M and a reduction in the electric Benefit Cost Ratio (RI Test) from 3.93 to 2.01. This also resulted in a reduction of total natural gas benefits from \$144M to \$98M and a reduction in the natural gas Benefit Cost Ratio (RI Test) from 3.09 to 2.12. For the 2022 Annual Plan monetized economic benefits are quantified but omitted from the primary presentation of benefits here. The exclusion of monetized economic benefits also applies to the Benefit Cost Ratio (RI Test).

<sup>44</sup> These results are adopted from a Massachusetts Market Characterization study, completed in March 2021. Rhode Island traditionally adopts the results of this study but is planning to do a RI-specific study for application in 2023.

Annual Plan. This decline in C&I lighting energy savings and associated benefits is the primary contributor to the 17% decline in the lifetime MWh goal, the 20% increase in the Cost/Lifetime kWh, the 18% decline in the total electric benefits (RI Test) and the corresponding 18% decline in the B/C Ratio (RI Test) from the 2022 3YP compliance filing to the 2022 annual plan. For more information on the removal of economic benefits from the RI Test Calculation see Attachment 4. The 12% decline in the proposed EE Program Charge per kWh is driven by two factors 1) an updated kWh forecast from a September 2021 release that increased the 2022 kWh sales forecast by 8.3% from approximately 6.77 billion kWh to 7.33 billion kWh and 2) a positive 2021 year end fund balance forecast of \$4.9M that is driven by higher than projected kWh sales revenues.

Evaluation results impacting the EnergyStar HVAC program was the main contributor to the 5% decline in net lifetime MMBtu from the 2022 3YP compliance filing to the 2022 annual plan. The 26% increase in the total electric benefits (RI Test) and the corresponding 29% increase in the B/C Ratio (RI Test) was driven by updates from the recently completed regional avoided cost study, referred to as AESC 2021, completed by Synapse Energy Economics as an update and replacement of the AESC 2018 Study that provided the monetization of most benefit categories in the 2019 – 2021 Annual Plans and the 2021 – 2023 Three-Year Plan. Finally, the increase in the C&I and Residential Program Charge per Dth is driven by the negative 2021 Year End Gas Fund Balance forecast of -\$5.1M. This overspend is due to an uptick in customer interest in efficiency services combined with increased incentive amounts designed to mitigate the impacts of COVID-19 on customer participation.

## 10 Funding Plan and Budgets

The 2022 Annual Plan will be submitted to the RI PUC on October 1, 2021, consistent with the revised LCP Standards in RI PUC Docket 5015.

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 2022 Annual Plan, the Company took into account the traditional factors (anticipated 2021 year-end fund balances and anticipated 2022 sales volumes) that always impact the relationship between requested implementation budgets and the required customer surcharges necessary to fund the proposed plan.

### 2021 Year-End Fund Balances

- Given the fixed nature of the 2021 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 by November 17<sup>th</sup>, 2021.
- The 2021 year-end fund balance will also be a function of actual implementation expenses and Company earned performance incentive through year-end 2021. For the October 1<sup>st</sup> submission to the PUC, the Company has included 2021 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 November 17, 2021<sup>45</sup> the Company will provide updated year-end fund balance forecasts, reflecting updated sales, collection, and program expenditure forecasts through year-end 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, 2022. 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 2022 energy efficiency programs. If the actual year-end 2021 fund balance as filed in the Year-End Report is higher or lower than that amount projected in the November 17, 2021 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.

### **Company Electric Energy Delivery and Gas Load Forecasts**

The Company forecasts electric energy deliveries and gas loads for a variety of filings. In the context of the Annual Energy Efficiency Plan, the forecasts primarily factor into the calculation of the per-unit energy charges that fund the gas and electric energy efficiency portfolios. At the time of this Plan's filing, an updated gas forecast based on the June 2021 release has been incorporated and an updated electric forecast based on the September 2021 release has been incorporated. The sections below provide an overview of the forecasting processes for the electric energy delivery and gas load forecasts.

#### **Electric Forecast Summary**

The electric energy deliveries forecast is developed in several steps.

The first step was to "reconstitute," that is add-back or subtract, as applicable, the impacts of energy efficiency ("EE"), solar-photovoltaics ("PV"), electric vehicles ("EV"), and electric heat pumps ("EH") to the historical monthly energy dataset. This set of programs and technologies is termed Distributed Energy Resources ("DERs"), and the reconstituted data is termed "gross" to reflect the fact that it represents data prior to the impacts of DERs.

The second step is to develop an econometric forecast of gross energy deliveries based on Rhode Island economic conditions, normal weather, and days billed, as appropriate, using this reconstituted dataset. The economic conditions are from Moody's economy outlook. The weather variables considered are cooling degree days ("CDDs") and heating degree days ("HDDs"). Normal weather is defined by the average CDDs and HDDs of the most recent ten years. Due to the unavailability and / or great

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<sup>45</sup> This date is being moved up two weeks due to the Annual Plan Filing date being moved up two weeks from October 15<sup>th</sup> to October 1<sup>st</sup>.

uncertainties of long-term weather forecasts, it is a common practice to use normal weather for long-term load forecasting.

The third step is to create the “net” forecast by adjusting the gross forecast by the projections for future DERs. Impacts for EE and PV (reflecting decreased electric load on the system) are subtracted from the gross forecast, impacts of EV (reflecting increased electric load on the system) are added to the gross forecast, and impacts of EH are added to or subtracted from the gross forecast depending on the season to create the net forecasts. These forecasts were first developed in terms of revenue classes – residential, commercial, and industrial. They were then allocated to the various rate classes using the current revenue to rate class percentages from the Company’s billing system.

### **Gas Forecast Summary**

The Company’s gas load forecast is based on a comprehensive methodology for forecasting retail customer load requirements using a series of econometric models to determine the changes expected for Residential Heating, Residential Non-Heating, Commercial, and Industrial markets. To determine the projected growth over the forecast period, the econometric models used historical economic, demographic, and energy price data, and weather data to determine total energy demand.

The product of the Company’s retail demand forecast is a forecast of meter counts, use-per-customer, and volume by month by internal rate code under normal weather conditions. The Company’s retail demand forecast is then converted to wholesale supply requirements at the Company’s city gates based on the relationship between city gate volumes (including supplementals) and weather on the daily level. The product of the Company’s wholesale customer requirements forecast is a forecast of volume by day under normal and design weather conditions.”

### **Annual Plan Funding Sources**

The sources of funding and the amounts of the funding proposed for the 2022 energy efficiency programs are shown in Table E-1 for electric programs and Table G-1 for natural gas programs.

The sources of funding for the 2022 electric programs are shown in Attachment 5 Electric EE Program Tables, Table E-1. To collect these funding sources for the 2022 cost-effective programs, the Company proposes: (1) one line on the customers’ bill labeled “Energy Efficiency Charge” at \$0.01425 per kWh, as calculated in Attachment 5, Table E-1 (composed of the existing energy efficiency program charge of \$0.01113 per kWh plus a fully reconciling funding mechanism charge of \$0.00312 per kWh in accordance with the requirements of R.I. Gen. Laws § 39-1-27.7); (2) projected Large C&I commitments from 2022, if any; (3) projected carryover of the year-end 2021 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.

The sources of funding for the 2022 natural gas programs are shown in Attachment 6 Gas EE Program Tables, Table G-1. The Company proposes that the 2022 budget should be funded from the following

sources: (1) one line on the customers' bill labeled "Energy Efficiency Charge" at \$1.221 per dekatherm for residential customers and \$0.836 per dekatherm for non-residential customers as calculated in Attachment 6, Table G-1 (composed of the existing energy efficiency program charge of \$0.871 per dekatherm plus a fully reconciling funding mechanism of \$0.350 per dekatherm for residential customers and the existing energy efficiency program charge of \$0.596 per dekatherm plus a fully reconciling funding mechanism of \$0.240 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 2021 fund balance, including interest at the rate in effect for customer deposits. Funding sources do not include revolving loan funds.

The 2022 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 2021 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 2021 will be \$4.9 million, as shown in Line 3, Attachment 5, Table E-1; the gas fund balance at year-end 2021 is estimated to be negative \$5.1 million, as shown in Line 2 Attachment 6, Table G-1. Other considerations regarding funding sources are described in the subsequent sections.

### 10.1 ISO-NE Capacity Market Revenue

Consistent with the LCP Standards, Annual Plan, and PUC decisions regarding annual plans since 2008, the 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 Company is to 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 Company may recover its prudently incurred costs from the energy efficiency program fund. 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,<sup>46</sup> 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 the financial assurance monies would be forfeited.

## 10.2 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.<sup>47</sup>

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 Company has developed recommendations for a process under which a manufacturer may submit its self-directed program and the required annual reports for approval. The Company recognizes 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.

## 10.3 Budgets

After consideration, the Company proposes budgets for this plan in line with the PUC's vote on December 22, 2020 to approve illustrative budgets for both electric and gas of 5% annual increases for the years 2022 and 2023, and the resulting three year plan compliance filing approved by the PUC on August 11, 2021.<sup>48</sup> The Company has considered areas for potential growth but must balance this with the prudence requirements of the Standards. More specifically, the Company must account for the anticipated significant increase in the Systems Benefit Charge and its impact on ratepayers.

The portfolio of energy efficiency programs and services for 2022 will have an overall budget of approximately \$122.6 million for electric programs and \$36.7 million for natural gas programs. The budget is segmented 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

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<sup>46</sup> 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.

<sup>47</sup> 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.

<sup>48</sup> <http://www.ripuc.ri.gov/eventsactions/docket/5076-PUC-OM%20Motions%20&%20Votes%201-7-21.pdf>



E-3 and Attachment 6, Table G-3. A comparison of these proposed budgets to the 2021 budget is provided in Attachment 5, Table E-4 and Attachment 6, Table G-4.

The Company will review the status of budgets regularly to assess whether they are likely to be fully utilized. If not being utilized, the Company will review the advisability of transferring funds to other programs where the money could be more effectively used. Fund transfer guidelines are presented in Section 10.4 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.

#### 10.4 Transferring Funds

Continuing from the approved notifications approved as part of the 2021 plan, the Company proposes the following guidelines for transfers between programs. The Company and stakeholders 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 EnergyWise, Multifamily, Income Eligible Multifamily, and C&I Multifamily (which are in different sectors) programs in order to achieve the overall savings goals of all programs. Although these are listed as separate lines in the program tables, they are essentially one program from an implementation standpoint. For all transfers between residential retrofit programs, the Company will reflect changes in the quarterly report(s) following the transfer and the year-end report.

- For transfers requiring Division and/or EERMC, but not PUC approval, the Company 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.

## 10.5 Budget Management

Deviations from the planned budget for 2022 are possible during the program year. The Company contemplates three scenarios, and will address them as follows:

- The Company's expenditures for 2022 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 2022 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 2022, 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. The PUC will not provide advance approval of expenditures exceeding the total budget by more than 10%. The Company will be required to demonstrate to the PUC that the transfer or overspend was prudent. Support from the Division, OER, and EERMC will be considered in the PUC's review of prudence.
- During a program year, if the Company did not anticipate and notify stakeholders 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 2022 Year-End Report, if not sooner.

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

## 10.6 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.

## 11 Performance Incentive Plan

The RI PUC approved a performance incentive mechanism (PIM) for 2021 – 2023 in Docket 5076 that changed the way that the Company measures and earns a performance incentive.<sup>49</sup> In years prior to 2021 the Company's earning opportunity was set equal to a percentage of the eligible spending budget upon achieving goal savings, subject to performing within budget bounds. The PIM, as approved in Docket 5076, changes the measurement of performance to a net benefits framework based on a set of prioritized benefit categories. Fundamentally, this change prioritizes utility system impacts over resource benefits generated by the programs and omits the societal benefits. The "netting" calculation incents budget controls so that the benefits are achieved in line with the portfolio budgets as proposed in the Plan.

### *Equation 3. Illustrative Calculation of Net Benefits for Performance Incentive Mechanism*

$$\text{Total Benefits} = (100\% \text{ of Utility System Benefits} + 50\% \text{ of Resource Benefits})$$

$$\text{Net Benefits} = (100\% \text{ of Utility System Benefits} + 50\% \text{ of Resource Benefits}) \\ - (\text{Programmatic Costs} + \text{Regulatory Costs})$$

The PIM continues to measure performance at the sector and fuel level:

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<sup>49</sup> Refer to Appendix A of PUC Report and Order No. 24225; written order issued on September 21, 2021 for final guidance on the PIM as approved in PUC Docket 5076. [http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20\(9-21-2021\).pdf](http://www.ripuc.ri.gov/eventsactions/docket/5076-NGrid-Ord24225%20(9-21-2021).pdf).

- Non-Income Eligible Residential Electric
- Income Eligible Residential Electric
- Commercial and Industrial Electric
- Non-Income Eligible Residential Gas
- Income Eligible Residential Gas
- Commercial and Industrial Gas

In the non-income eligible residential and income eligible residential sectors, the calculation of net benefits using the above prioritized calculation of benefits results in negative net benefits, so the earning opportunities for each fuel’s portfolio are allocated to the C&I sector. The PIM also includes Service Quality Adjustments (SQAs) in the non-income eligible residential and income eligible residential sectors which require the Company to achieve defined levels of performance equal to the sum of prioritized total benefits. If the defined levels of service (total benefits) are not achieved in the residential and income eligible sectors, the SQAs apply reductions to any realized earnings in the commercial and industrial sector. The SQAs also include a cost component that adjusts the realized performance, and consequently any reduction of C&I earnings, based on how the realized expenditures in the residential and income eligible sectors compare to planned budgets. The SQAs therefore provide a similar incentive signal as the “netting” calculation in the core of the PIM and provide the Company with signals that savings and benefits should be pursued and prioritized in each sector, rather than exclusively the Commercial and Industrial sector where the earning opportunity resides.

In addition, the PIM calculations include a set of potential adjustments that are intended to further incent the company to maintain budget controls in the delivery of savings, and therefore prioritized benefits, by adjusting earnings under this mechanism based on cost relative to budget.

Attachment 5, Table E-8A and Attachment 6, G-8A show the categories of benefits that are included in the PIM calculations, categories omitted from the PIM, and the weighting assigned to those benefits in the calculation. The categories of benefits are also summarized in the table below. The monetized benefits included in the PIM are calculated from a subset of benefit categories included in the RI Test, calculated using the same methods and inputs as the RI Test.

*Table 20. Electric Energy Efficiency Portfolio Benefits Alignment for PIM Calculations*

| Benefit                         | PIM Categorization               | Percent Allocation in PIM Calculation |
|---------------------------------|----------------------------------|---------------------------------------|
| Summer Generation               | Electric Utility System Benefits | 100%                                  |
| Capacity DRIPE                  |                                  |                                       |
| Transmission                    |                                  |                                       |
| Distribution                    |                                  |                                       |
| Reliability                     |                                  |                                       |
| Winter Peak Electric Energy     |                                  |                                       |
| Winter Off Peak Electric Energy |                                  |                                       |
| Summer Peak Electric Energy     |                                  |                                       |
| Summer Off Peak Electric Energy |                                  |                                       |
| Electric Energy DRIPE           |                                  |                                       |

| Benefit                           | PIM Categorization          | Percent Allocation in PIM Calculation |
|-----------------------------------|-----------------------------|---------------------------------------|
| Utility Non-Energy Impacts (NEIs) |                             |                                       |
| Natural Gas and Natural Gas DRIPE | Resource Benefits           | 50%                                   |
| Oil and Oil DRIPE                 |                             |                                       |
| Propane                           |                             |                                       |
| Water                             |                             |                                       |
| Non Resource (NEIs)               | Other Not Included Benefits | 0%                                    |
| Non-Embedded Carbon               |                             |                                       |
| Non-Embedded NOx                  |                             |                                       |
| Economic                          |                             |                                       |

Table 21. Gas Energy Efficiency Portfolio Benefits Alignment for PIM Calculations

| Benefit                           | PIM Categorization          | Percent Allocation in PIM Calculation |
|-----------------------------------|-----------------------------|---------------------------------------|
| Natural Gas                       | Gas Utility System Benefits | 100%                                  |
| Natural Gas DRIPE                 |                             |                                       |
| Utility Non Energy Impacts (NEIs) |                             |                                       |
| Summer Generation                 | Resource Benefits           | 50%                                   |
| Capacity DRIPE                    |                             |                                       |
| Transmission                      |                             |                                       |
| Distribution                      |                             |                                       |
| Reliability                       |                             |                                       |
| Winter Peak Electric Energy       |                             |                                       |
| Winter Off Peak Electric Energy   |                             |                                       |
| Summer Peak Electric Energy       |                             |                                       |
| Summer Off Peak Electric Energy   |                             |                                       |
| Electric Energy DRIPE             |                             |                                       |
| Oil and Oil DRIPE                 |                             |                                       |
| Propane                           |                             |                                       |
| Water                             |                             |                                       |
| Non Resource (NEIs)               |                             |                                       |
| Non-Embedded Carbon               |                             |                                       |
| Non-Embedded NOx                  |                             |                                       |
| Economic                          |                             |                                       |

Tables E-8B and G-8B show the costs that are used in the “netting” calculations in the PIM, and that are incorporated in the SQAs in the sectors to which they apply. The core of the costs included in the PIM remain the “Eligible Spending Budget” derived from Attachment 5, Table E-3 and Attachment 6, Table G-3. The Eligible Spending budget is calculated based on the total budget from Tables E-2 and G-2 with commitments, regulatory costs, pilot costs, assessment costs, and performance incentive value

removed.<sup>50</sup> Notably, in the new PIM the regulatory costs for collections allocated to OER, the EERMC, and the Rhode Island Infrastructure Bank (RIIB) are added into the calculations of total costs for the net benefits calculations and the SQAs.<sup>51</sup> This is a change from the PIM that was in place prior to 2021.

Tables E-8C and G-8C show the final summarizations of the calculations for the PIM and SQAs, including target earning opportunities and maximum earning opportunities. The Company is seeking electric performance incentives of \$5.5 million (all through C&I) and natural gas performance incentives of \$1.6 million (also all through C&I). These levels were set by the PUC for 2021 and have been maintained at those levels for 2022. With respect to the CHP project noted in Section 6.1, should that project not receive PUC approval, the Company anticipates that funds currently budgeted for that project incentive would be reallocated to budget for other C&I projects and programs. Those efforts would be consistent with the efforts undertaken in recent years to reallocate funds following PUC rulings on the 2020 and 2021 Annual Plans. Given that these alternative projects would likely yield fewer savings and benefits than the planned CHP project, the Company would, in this scenario, anticipate requesting a reset of target benefits and goals used to calculate target and actual PIM performance and performance incentive earnings.

## 12 Future Performance Metrics

The Company proposes to continue tracking several performance metrics initiated in past plans.

### 12.1 Testing Performance Metrics

In 2022, the Company proposes to continue tracking and reporting performance related to certain metrics in order to test progress towards several key objectives.

#### *12.1.1 Carbon and Carbon Dioxide Equivalent (CO<sub>2</sub>e) Reductions*

The Company proposes to continue tracking carbon reductions resulting from investments in energy efficiency measures, as was initiated in the 2021 Plan. While the net benefits-based PIM approved for the Three-Year Plan makes a performance incentive based on emissions reductions less likely, the contribution of energy efficiency to the emissions reductions goals in the Act on Climate is a valuable data point.

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<sup>50</sup> The Eligible Spending Budget also omits the costs of the Company's active demand response (Connected Solutions) programs. The peak demand reductions achieved through those programs are subject to the Amended Settlement Agreement in Docket Nos. 4770 and 4780 filed with the PUC on August 10, 2018, and the System Efficiency PIM contained therein. Spending and benefits derived from active demand reductions are therefore excluded from the EE PIM calculations.

<sup>51</sup> Regulatory costs for 2022 include an allocation of funds to RIIB. Previously these costs were aligned in the Commercial and Industrial program budget. This change in how the RIIB-allocated funds are counted for budgetary and PIM calculation purposes was made to align with recently passed revisions to the Least Cost Procurement Law. See R.I. Pub. Laws Ch. 224 (2021): <http://webserver.rilin.state.ri.us/PublicLaws/law21/law21224.htm>

### 12.1.2 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. In 2020 and 2021 the Company engaged in several efforts to quantify peak gas demand savings resulting from gas energy efficiency measures for application in future. The Company joined an existing residential study in Massachusetts in 2020 and expanded the study scope to Rhode Island homes to measure peak gas demand savings resulting from residential sector energy efficiency measures. The Company also conducted a study of commercial and industrial peak gas demand in 2020/2021. Results of those efforts are expected to be incorporated in tracking and reporting in 2022.

## 12.2 Forward Looking Performance Metrics

### 12.2.1 Equity Metric Tracking

In 2020 the Company began an analysis of the data it possesses on participants that are renters, along with rental units, and expanded the collection of this information across more programs, where appropriate. The Company will continue to track and refine this data in 2022 and begin reporting on the performance to this metric. The renter metric will serve as one input to the assessment of the programs' equity performance. If the Company and stakeholders determine that 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, that may be considered for a future component of the performance incentive mechanism.

As noted earlier in Section 2.5.1, as part of the equity focus of the 2022 Plan, the Company will also track and report on minority and women owned businesses that are providing services to the EnergyWise program as an outcome of the work of the Energy Efficiency Equity Working Group.

## 13 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 2022 also advance the Docket 4600 principles and goals.<sup>52</sup>

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."<sup>53</sup>

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<sup>52</sup> PUC Report and Order No. 22851 accepting the Stakeholder Report. Written Order issued July 31, 2017 .

<sup>53</sup> Approved final clean version of Guidance Document 10/27/17 .

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 22.

*Table 22. 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 \$359 million to Rhode Island’s Gross State Product (GSP), equivalent to 3,221 job-years.   |
| Address the challenge of climate change and other forms of pollution.  | Advances: The Plan will avoid 608,736 tons of carbon over the lifetime of the installed measures as well as reduce other pollutants associated with the generation and 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 and provides handoffs to other programs including EV charging 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.   |



| 4600 Goals for Electric System   | Advances/Detracts/Neutral   |
|--|---|
| 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

### 14 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.
- National Grid may convene the Energy Efficiency Technical Working Group no less than six times in 2022 to review the status and performance of the Company’s 2022 energy efficiency programs and advise the Company on potential energy efficiency programs for 2023.

### 15 Reporting Requirements

In 2022, the Company will provide quarterly reports to the EERMC, the Division, OER, the EE EWG, 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. Consistent with PUC Order 24225 and R.I. Gen. Laws § 39-1-27.7, the Company will work with the Rhode Island Infrastructure Bank on appropriate loan fund reporting. The reports will also include a 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 2020 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 2022 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 2022 for months during which quarterly reports are not produced, the Company will provide to the EERMC, the Division, OER, and the EE TWG monthly summaries of year-to-date spending and savings and results by sector.
- The Company will provide to the EE TWG, the EE EWG, and file with the PUC its 2022 Year-End Report no later than June 1, 2023. This report will include achieved natural gas and electric energy savings in 2022 and earned incentives for 2022.
- The Company will provide 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 2022 programs, in the Plan to be filed by October 1, 2021.

## 16 Requested Rulings

The Company respectfully requests that the PUC approve the 2022 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 2022.
- The pilots, demonstrations, and assessments the Company proposes for program year 2022 and the associated budgets and customer collections required to fund those efforts.
- The performance incentive mechanism and associated earning opportunity as approved in the three-year plan and applied in this Annual Plan.

**Attachments**  
**2022 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

Annual Plan Attachment 10. Definitions

Annual Plan Attachment 11. Energy Efficiency Equity Working Group Final Report



# 2022 Residential and Income Eligible Energy Efficiency Solutions and Programs

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## 1. Overview

2022 is a pivotal year for residential energy efficiency programming. The retail residential lighting program concluded at the end of 2021 with lighting opportunities continuing only in the direct install programs during the year. 2022 builds on the transition away from lighting by concentrating on longer energy savings benefits in the residential portfolio and equitable access to the programs for all Rhode Island customers. The goal of the 2022 Plan is to support the transition of inefficient homes to energy efficient homes by maximizing the potential of weatherization, heating/cooling/hot water systems, efficient appliances, and Wi-Fi controls. Attainment of the energy efficiency savings goal is supported through high-efficiency equipment and well-trained energy experts and service providers. This vision is for all homes to be well weatherized, 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 Attachment 1 offer a snapshot and evidence of how programs are continuously evolving, building from one Plan year to the next. It shows 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 while cross promoting other programs.

The detail in this attachment is designed to allow stakeholders, the Public Utilities Commissioners (PUC) 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 2022**

The Company has focused heavily on weatherization, efficient heating, and equity across all residential programs. The elevation of these three critical areas reflect stakeholder priorities and opportunities identified during the planning process. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the Energy Efficiency & Resource Management Council (EERMC) and its consulting team, the Office of Energy Resources (OER), the Division of Public Utilities and Carriers (the Division), Technical Working Group Stakeholders, our vendors, and customer feedback. There are electric heat opportunities introduced in more programs and 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 resources exist to promote energy efficiency to all Rhode Islanders. Of particular note, the Income Eligible Services (IES) program is working closely with the Company’s discount rate program to introduce newly enrolled customers on the discount rates to the income eligible program where 100% of energy upgrade costs are covered. To support development of high growth, long-term, energy jobs that support the shift to high performance homes and technologies, air source heat pump (ASHP) design and installation training and Zero Net Energy New Construction training are planned to help 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*

| Market Rate Residential Sector                    | Income Eligible Sector        |
|---|-------------------------------|
| EnergyWise 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                   |                               |
| Residential Consumer Products                     |                               |
| Residential High Efficiency Heating and Hot Water |                               |

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 2022, along with the rationale for changes in a table format.

The Company will continue to focus on demonstrations and assessments; please refer to Attachment 8 for a detailed scope and list for each demonstration and assessment proposed for the 2022 Energy Efficiency Plan.



**Program Description Structure**

In order to streamline PUC, stakeholder, and reader access to the most pertinent program information in the 2022 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 2022                                   | 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 2022**

| Fuel | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand | Lifetime MMBtu | Budget (\$000) | Participation <sup>2</sup> |
|------|-------------------------|-----------------------|-----------------------|----------------|----------------|----------------------------|
|------|-------------------------|-----------------------|-----------------------|----------------|----------------|----------------------------|

<sup>2</sup> For information on the metric used to measure participation by program, please reference the main text, section 2.6.

|          |  |  |                            |  |  |  |
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|          |  |  | Reduction kW<br>(Electric) | (Electric<br>Gas, Oil,<br>Propane <sup>1</sup> ) |  |  |
| Electric |  |  |                            |  |  |  |

Gas Program Goals, Metrics, Budgets, Participation for 2022

|     | Lifetime<br>MMBtu<br>(Gas) | Annual<br>MMBtu<br>(Gas) | Budget<br>(\$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.

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<sup>1</sup> For a breakdown of program level energy savings goals see Attachment 5, table E6-A and Attachment 6, table G6-A for more details.

Figure 1: 2022 Planned Distribution of Lifetime MWh Goals for Residential Electric Sector

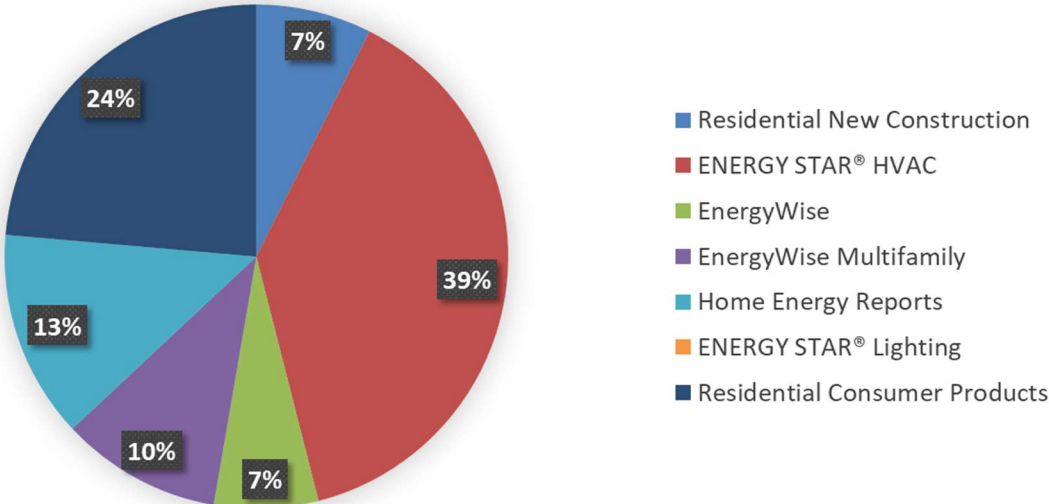


Figure 2. 2022 Planned Distribution of Annual MWh Goals for Residential Electric Sector

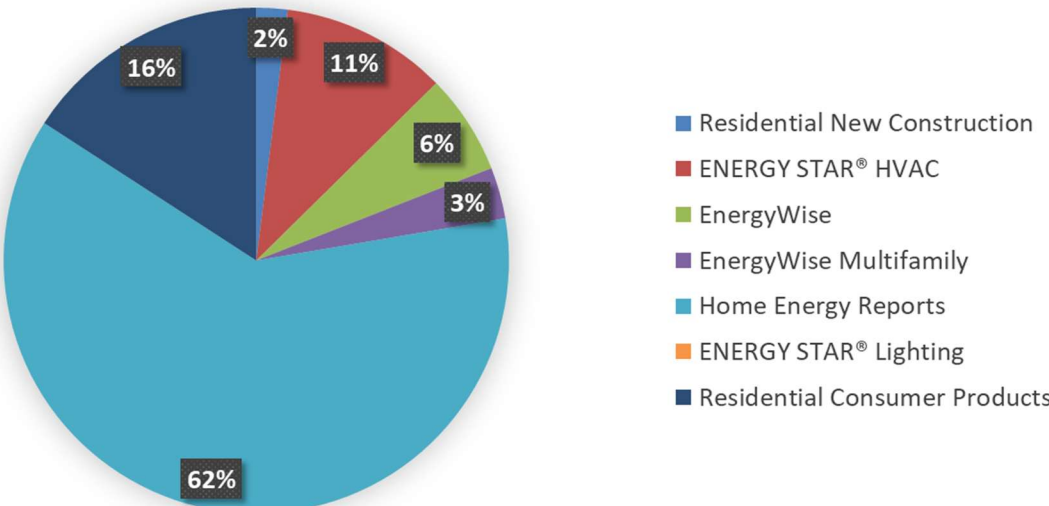


Figure 3. 2022 Planned Distribution of Lifetime MMBtu Goals for Residential Gas Sector

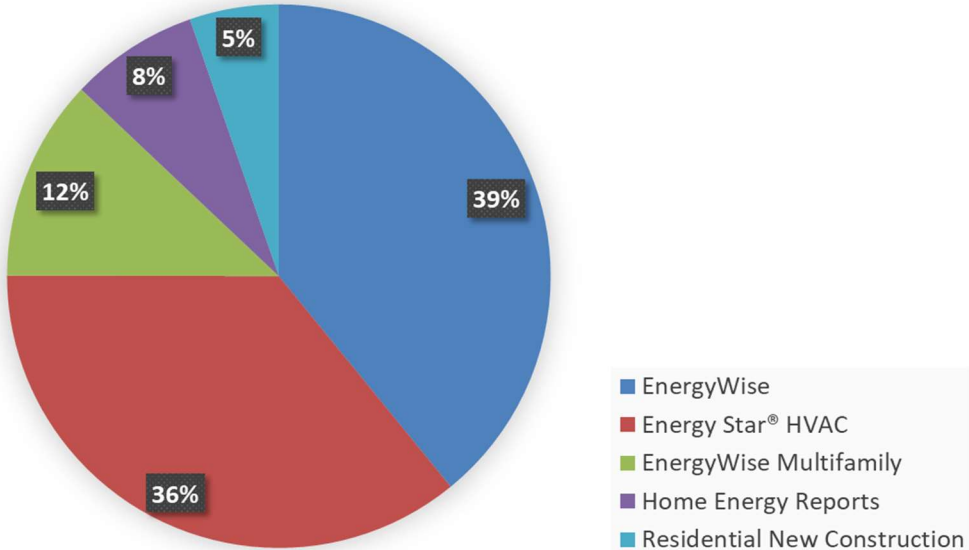


Figure 4. 2022 Planned Distribution of Annual MMBtu Goals for Residential Gas Sector

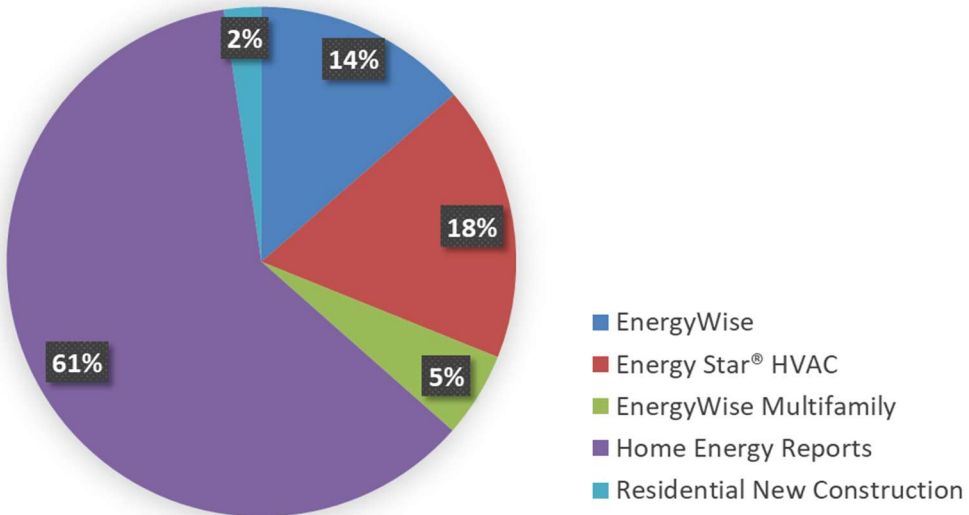


Figure 5. 2022 Planned Distribution of Lifetime MWh Goals for Income Eligible Electric Sector

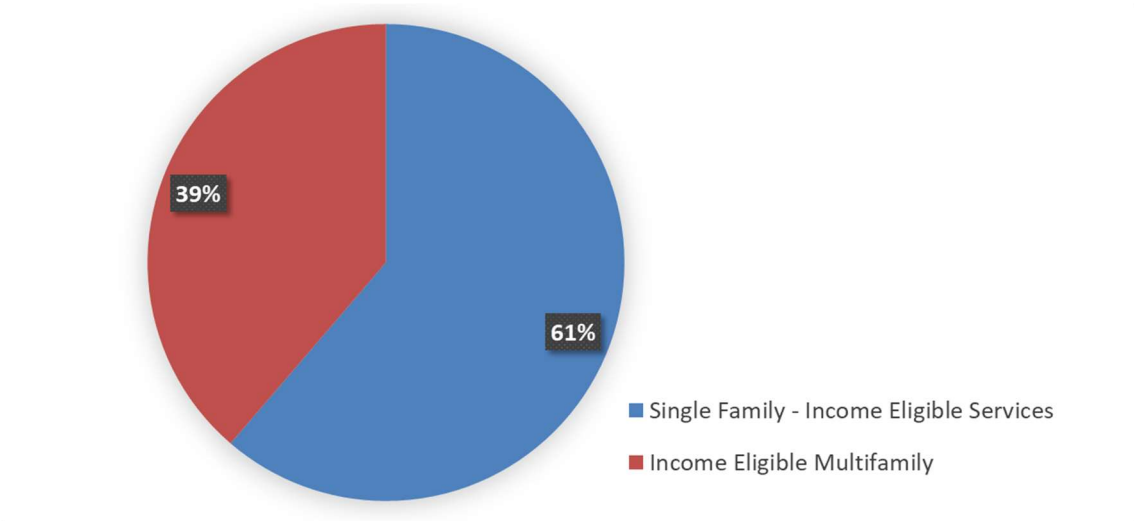


Figure 6. 2022 Planned Distribution of Annual MWh Savings for Income Eligible Electric Sector

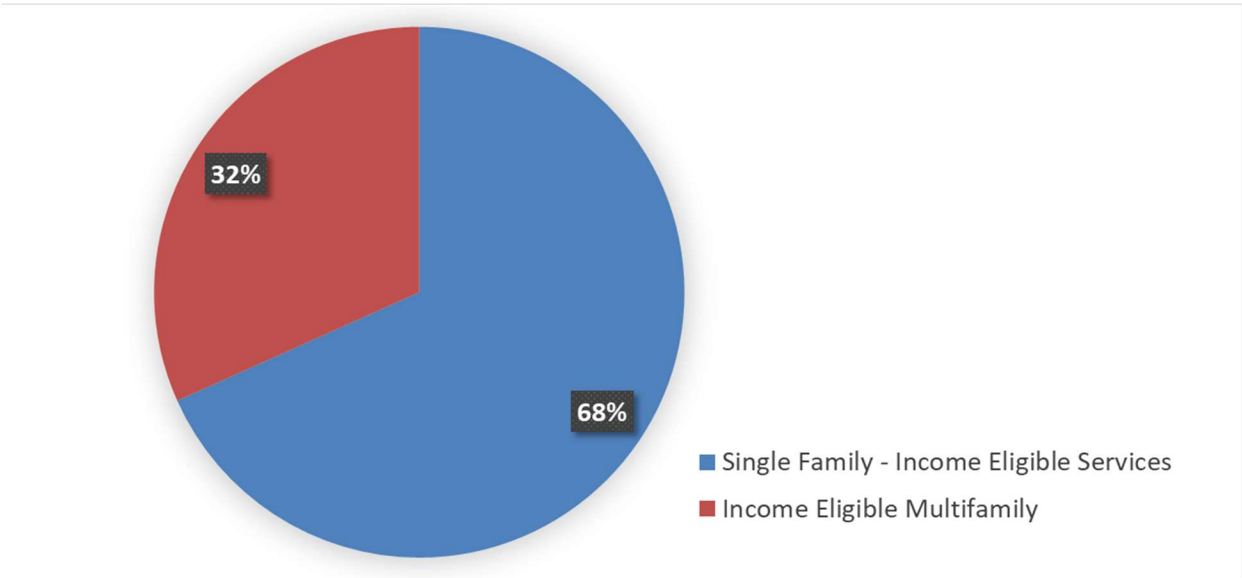


Figure 7. 2022 Planned Distribution of Lifetime MMBtu Goals for Income Eligible Gas Sector

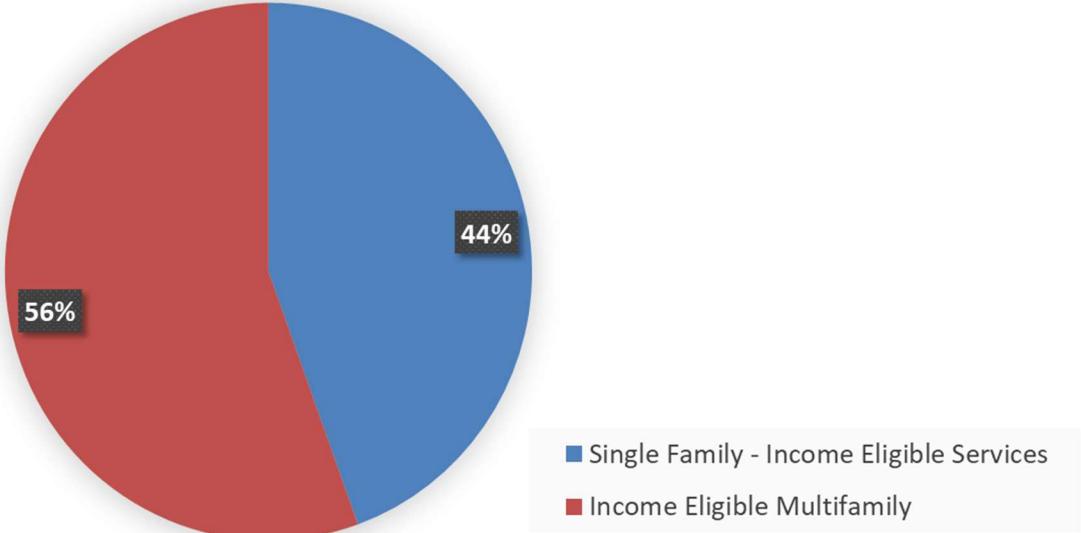
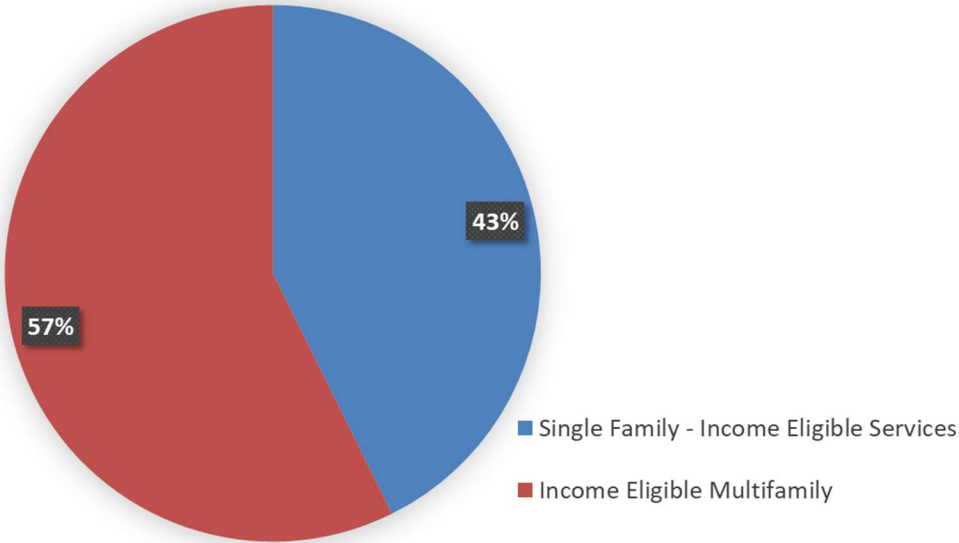


Figure 8: 2022 Planned Distribution of Annual MMBtu Goals for Income Eligible Gas Sector



## 2. EnergyWise Single Family (Electric and Gas)

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| Eligibility Criteria | <p>EnergyWise 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.</p>  |
| Offerings            | <p>EnergyWise offers comprehensive energy efficiency services using a whole-house approach to identify energy saving opportunities in all major energy systems and uses, including heating, cooling, water heating systems, appliances, lighting, water saving measures, plug loads, and building envelope leaks. In 2021, EnergyWise was awarded an ENERGY STAR® Partner of the Year, Sustained Excellence in Energy Efficiency Program Delivery for the sixth consecutive year. 12,000 home energy assessments are planned for 2022. EnergyWise provides in-home services in two phases: home energy assessment and weatherization.</p> <p><b>Home Energy Assessment</b></p> <p>Historically, an in-home, no cost energy assessment was the entry point for customers into the EnergyWise 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), a Building Performance Institute certified building analyst, will upgrade lighting, provide advanced power strips, and upgrade water saving opportunities where opportunities exist, and customers are amenable. 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).</p> <p><b>Virtual Home Energy Assessment (VHEA)</b></p> <p>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-</p> |

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|  | <p>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. The virtual assessment provides multiple options to communicate energy savings information depending on customer familiarity with smart phone and video calling technologies. A video call can be used to guide the customer around their home so an energy specialist can assess the home's energy use. If the customer is not able to use video, the specialist will have the customer send in pictures (before or after the VHEA) of important areas such as the attic, heating and water heating system, and basement crawl spaces while walking through the assessment by phone.</p> <p>In 2022 customers will be able to choose whether to have an in-person assessment or a VHEA. Approximately two-thirds of customers have selected the in-person assessment over the VHEA. Customer satisfaction scores from post assessment customer surveys show consistent satisfactions scores between in-person and VHEAs, with a slightly higher rating for in-person assessments.</p> <p><b>Online Home Energy Assessment (OHEA)</b></p> <p>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.</p> <p>Online home energy assessment tool v2 is set to launch at the end of 2021. The OHEA consists of a 5-minute online survey to collect information on the customer's home profile and provides disaggregation results, top recommendations, and savings tips back to the customer. Through promotion within emailed Home Energy Repots (HER) and QR codes on print HERs, customers will be automatically directed to the authenticated version of the online assessment tool, and data collected will feed back into the behavior platform for more accurate and personalized normative comparisons and recommendations across the platform, within home energy reports and the Company's customer facing Web portal. Customer</p> |
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|  | <p>responses on heating and water heating system age and insulations levels are used as leads for energy efficiency programs.</p> <p><b>Weatherization</b></p> <p>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), duct sealing, 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.</p> <p>The recently completed <i>EnergyWise</i> 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, <i>EnergyWise</i> 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 customers that certify that pre-weatherization barriers have been remediated by appropriate licensed professionals. Additionally, pre-weatherization costs for knob and tube wiring, vermiculite, and asbestos can be included in the HEAT Loan.</p> <p><b>Energy Action Plan</b></p> <p>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</p> |
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|  | <p>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. The work will then be assigned to a weatherization contractor who will contact the customer directly to schedule a date for weatherization work.</p> <p><b>Connecting Customers with Additional Opportunities</b></p> <p>The EnergyWise 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 heat pump water heaters. 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.</p> <p>The EnergyWise 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 <a href="https://ri.home.marketplace.nationalgridus.com/content_solar_energy.html">https://ri.home.marketplace.nationalgridus.com/content_solar_energy.html</a></p> <p><b>Moderate Income Customers</b></p> <p>In 2022, the Company proposes serving moderate income customers, defined as households that fall at 80% or below the state median income. Customers that are interested in the moderate income offering will receive 100% weatherization incentives once they are income qualified by the</p> |
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|                             | <p>third-party income verification vendor. The quick income qualification allows the Company to direct customers that qualify for the Income Eligible rate to customer service for additional bill savings that can be realized on monthly bills.</p> <p>During the end of 2021, the Company received RGGI funds from the RI Office of Energy Resources dedicated to moderate income customers receiving 100% weatherization incentives. This offering has the same household income threshold, at or below 80% of state median income, but differs slightly in that customers can participate in the RGGI moderate income offering through a self-attestation of household income. It is the Company’s aspiration to have the RGGI funds committed or disbursed to customers during 2021. If RGGI funds are still unspent in 2022, the RGGI offering will be promoted to the Rhode Island Department of Health’s March 30, 2021 Hardest-Hit COVID zip codes<sup>3</sup> and the new moderate income offering will be promoted to remainder of Rhode Island customers.</p> <p>EnergyWise will continue with the 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.</p> <p>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.</p> |
| Implementation and Delivery | <p>EnergyWise 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, duct sealing, and insulation). The Lead Vendor provides program oversight of 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 six years of ENERGY STAR® Partner of the Year awards for program implementation.</p>  |

<sup>3</sup> <https://covid.ri.gov/press-releases/governor-mckee-ridoh-announce-additional-vaccination-appointments-expanded-efforts>

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|  | <p>A customer begins the home energy assessment process by either calling, emailing, or mailing an expression of interest and the initial in-home or virtual assessment, based on customer preference, 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 referred to an insulation contractor. The insulation contractor will then contact the customer to schedule a date 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.</p> <p>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.</p> <p>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.</p> <p>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 minutes to</p> |
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|                          | <p>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.</p>   |
| <p>Customer Feedback</p> | <p>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</p> <p>A sampling of customer feedback from customer satisfaction surveys follow:</p> <p>Program Suggestions</p> <ul style="list-style-type: none"> <li>• “I wish you were into helping replacing windows. I had to put plastic up on windows this winter.”</li> <li>• “I wish the program included doors and windows. Those are the biggest issues in my home”</li> </ul> <p>Professional and Knowledgeable</p> <ul style="list-style-type: none"> <li>• “We had a very professional and very polite inspector, we also learned a lot from him.”</li> <li>• “Your representative arrived timely. He was professional and knowledgeable. He was thorough and friendly. He answered all of my questions. He provided us with a report in a timely matter. His recommendations were reasonable and easy to understand.”</li> </ul> <p>Great Program</p> <ul style="list-style-type: none"> <li>• “We were very satisfied with the work done, the inspections and the explanation that was given to us. The cleanup inside our house was great as well. However there was insulation/sealing materials left all over our yard. It was snowing so we believe it may have been covered up by the falling snow so the team didn't see it, but since the snow melted we have been finding and picking up various materials from the yard. This was a danger to our pets. Overall it was a</li> </ul> |

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|                         | <p>great experience. We wanted to flag this so you are aware for future customers.”</p> <ul style="list-style-type: none"> <li>• “This is a great program. Reducing home heating cost is a great way to reduce CO<sup>2</sup>. Using less energy for cooling too. Waiting time was 9 months to get insulated. I understand construction so I knew what was happening.”</li> </ul> <p>Worth the Wait</p> <ul style="list-style-type: none"> <li>• “The timeline for work was extended out much more than I had anticipated due to the pandemic, but it was very much worth the wait! The insulation has made an enormous difference in my home!”</li> <li>• “Took longer than expected due to masonry issues in attic space that had to be addressed before insulation work could be completed. Insulation work was begun in the late fall/early winter, but could not be completed until months later in April because the masonry work had to wait until the outside temperature was consistently high enough. So, many unexpected delays but the work did eventually get completed and the crew was always very polite when they were here. Cleaned up the copious dust well but left black handprints on the ceiling hatch to the attic space. Work was only recently completed so cannot judge whether it had any noticeable positive effects yet--maybe after next winter we'll have a better sense!”</li> </ul> |
| <p>Changes for 2022</p> | <p><b>Supporting equity by adding a reporting element for Independent Insulation Contractors that are sub-contractors in the EnergyWise program.</b> The lead vendor will report on the number of minority and women owned businesses working within EnergyWise so a baseline can be established.</p> <p>The program will test a <b>concierge service for electric resistance heated homes to facilitate the design and right sizing of a heat pump electric heating system installation.</b> The Lead Vendor will calculate the sizing and work with HVAC contractors to schedule the installation of the new system. The customer benefits by having one point of contact for both the weatherization and HVAC installations.</p> <p>The Lead Vendor will continue <b>workforce development upskilling</b> that supports EnergyWise. Historic trainings have included sales support for</p>   |

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|                       | <p>promoting energy efficiency and identifying opportunities for electric heat. In 2022, to support the concierge service above, the training may focus on Manual J calculation, the protocol used to determine proper heating and cooling sizing for a residence, and optimal design for heating and cooling with electric heat pumps.</p> <p>EnergyWise will <b>offer a 100% weatherization incentive for moderate income customers, defined as households at or below 80% state median income.</b> 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.</p> <p>In an effort to optimize <b>deeper energy upgrades</b>, EnergyWise will partner with the gas HVAC program to promote an enhanced incentive when a customer does both weatherization and efficient gas equipment upgrades. The enhanced incentive model, developed for the Air Source Heat Pump (ASHP) heating system upgrade, has become a best practice as the customer is required to do weatherization prior to the ASHP installation to improve thermal envelope efficiency to properly size the heating system. In 2022, the Company will provide customers engaging in efficient gas heating system upgrades with a voluntary path to also weatherize their homes. To encourage the weatherization action, the Company proposes an 25% additional incentive on the weatherization work.</p> <p>The Company is <b>jointly sponsoring research with other utilities</b> through ESource and ICF to advance the evolution of incentive design through the Incentive Project. This will be the second year of a three-year research project that 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.</p> |
| Rationale for Changes | <p><b>Equity reporting for minority and women owned businesses supporting EnergyWise:</b> 2022 will establish a baseline of minority and women owned business reporting for contractors that provide weatherization services for the program. Once a baseline is established, the Company can develop next step actions to support these businesses.</p> <p><b>Concierge service for electric resistance heated homes:</b> For some customers time and program complexity can be a significant barrier in progressing through energy efficiency upgrades. The Company will work</p>  |

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|  | <p>with electrically heated homes to perform a Manual J calculation for electric heat pump systems based on rightsizing systems after weatherization. The customer will have one primary point of contact for their efficiency work that coordinates all the activities.</p> <p><b>Facilitating connections to HVAC and/or electrical contractors:</b> 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 such as a clean and tune up of the heating system and certification of knob and tube wiring by an electrician. Both of these barriers can generally be remedied by the \$250 pre-weatherization funding. The Company will also coordinate with the multifamily program to identify contractors that remediate other pre-weatherization barriers such as asbestos, lead, and vermiculite. The alleviation of pre-weatherization barriers was also a recommendation from the recently completed EnergyWise evaluation.</p> <p><b>Workforce development upskilling:</b> One benefit of this program is that customers receive consistent assessments by skilled energy specialists. By continually upgrading skills required to successfully communicate the benefits of energy efficiency, the Company works with the Lead Vendor to identify skill enhancements that supports EnergyWise success.</p> <p><b>100% weatherization incentive for moderate income customers:</b> 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. A primary barrier to achieving even higher conversion rates even with an 100% incentive are pre-weatherization barriers. The cost of remediation can exceed the overall total cost of weatherization depending on the type and number of barriers that exist at the residence.</p> |
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|                               | <p>Expanding the incentive to moderate income consumers helps to achieve both savings and equity priorities while reducing costs for weatherization.</p> <p><b>Deeper energy upgrades</b> build upon the best practice of weatherizing a home during sizing of air source heat pumps for electric heat. This new practice will encourage customers to weatherize when replacing gas heating equipment so optimal sizing will occur. The pairing of weatherization with efficient heating system installation captures two major opportunities for energy efficiency upgrades within a home.</p> <p>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.</p> |
| Proposed Upcoming Evaluations | Secondary Heat – Follow-up Research will be conducted in 2022 as well as an evaluation on Moderate Income NEI (non-energy impacts).  |
| Notes                         |  |

**EnergyWise Single Family – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 13,472                  | 2,789                 | 424   | 414,190                                     | \$15,766       | 12,000        |

**EnergyWise Single Family – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 478,550              | 20,850             | \$8,646        | 1,761         |

### 3. Multifamily (Electric and Gas)

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| <p>Eligibility Criteria</p> | <p>Eligible multifamily program participants are defined as the following:<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Buildings with five or more dwelling units</li> <li>• Properties consisting of four or more one- to-four-unit buildings that meet both of the following requirements: <ul style="list-style-type: none"> <li>○ Are within a reasonable geographical distance from each other, or to a five plus unit building, and</li> <li>○ Are owned by the same individual or firm.</li> </ul> </li> </ul> <p>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 may be waived.</p> <p>The income-eligible multifamily sector is defined by properties that meet one of the following criteria:</p> <ul style="list-style-type: none"> <li>• Owned by public housing authorities or community development corporations;</li> <li>• Receive affordable housing tax credits or other types of low-income funds/subsides from the state or federal government; or</li> <li>• Consist of building units where a majority of customers (over 50% of occupants) 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).</li> </ul> <p>Moderate income customers (customers that are at 80% or below the state median income) are included in the eligibility criteria of the Income Eligible Multifamily Program as they are represented in other units of an income eligible multifamily property that may not meet the eligibility criteria for low-income customers. For example, if a multifamily property has a total of 20 units, and 12 of which qualify as income eligible, the moderate customers could make up the remaining 8 units of the property and therefore be eligible to participate in the Income Eligible Multifamily Program offerings. 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 incentives through both Multifamily and the Commercial &amp; 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</p> |
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|                             | <p>equity for all customers, funding energy efficiency through the energy efficiency program charge. In contrast, the customer will not need to experience this added layer of complexity and will instead receive a consolidated incentive for all efficiency work completed at the site. The Programs’ lead vendors are well versed in managing projects these types of multifamily dwellings and help the customer navigate the process of participating in both programs.</p>   |
| Offerings                   | <p>The program offers comprehensive energy services for multifamily customers including:</p> <ul style="list-style-type: none"> <li>• Energy assessments,</li> <li>• Incentives for heating and domestic hot water systems, cooling equipment, lighting, appliances and air source heat pumps.</li> <li>• Coordination for all services will be offered for multifamily properties that participate in the Market-Rate and Income Eligible Multifamily Programs.</li> </ul>   |
| Implementation and Delivery | <p>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 can learn about the Company’s Multifamily Program offerings in a myriad of ways ranging from communicating directly with the lead vendor, the National Grid website, direct mail and print marketing, and digital marketing campaigns. If the customer is interested in starting the process, the customer would go through the following steps:</p> <ol style="list-style-type: none"> <li>1. A customer learns about the Multifamily Program through the following, but not limited to, channels: <ol style="list-style-type: none"> <li>i. Marketing efforts lead by the Company and/or lead vendor</li> <li>ii. The lead vendor directly contacting the customer</li> <li>iii. The Company’s website</li> <li>iv. Word-of-mouth</li> </ol> </li> <li>2. A customer contacts the multifamily lead vendor to express interest in receiving an energy assessment.</li> <li>3. A “pre-assessment” is performed over the phone or in person by the lead vendor to determine if the customer is eligible for participation in the program based on the aforementioned criteria.</li> <li>4. An energy assessment is then scheduled with the facility’s authorized representative.</li> <li>5. An energy assessment is completed by an energy specialist to identify ways to conserve electricity, natural</li> </ol> |

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|                   | <p>gas, or delivered fuels. This is coordinated by the lead vendor.</p> <ol style="list-style-type: none"> <li>6. 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. Projects may participate in the Multifamily Program as long as the overall program remains cost-effective.</li> <li>7. 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.</li> <li>8. Once installation work is completed, a final walk through with the customer is done. A completion report is then created and presented to the site's authorized representative and signed off on. A customer survey is also conducted once work is complete.</li> </ol>  |
| Customer Feedback | <p>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:</p> <ul style="list-style-type: none"> <li>• On a scale of 1 to 5, how satisfied are you with the energy efficiency services you received?</li> <li>• On a scale of 1 to 5, would you recommend this service to family, friends, and/or colleagues?</li> </ul> <p>The most recently available average survey score for 2020 is 86.</p> <p>The following includes customer quotes leveraged from the lead vendor's 2020 customer satisfaction survey results:</p> <p><i>"I was VERY impressed with the contractors. They were all very professional, personable, and informative. I feel they did a thorough job, kept me informed every step of the way and were very neat and clean in the way they did their work. They REALLY appreciated the fact that I followed directions and emptied my entire closet for them to get up in the crawl space. I appreciated they recognition of my effort."</i></p> <p><i>"I wasn't sure how to work the shower head, so the worker came back the next day to show me."</i></p> |

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|                  | <p><i>“I felt an almost immediate improvement in heat retention after attic was insulated. I was surprised when I found a positive change in heating bill which also resulted in a lesser electric bill.”</i></p> <p><i>“The workers were helpful and knowledgeable, and when they left you would have never known they were here. Already seeing changes in the time it takes to warm up the condo when we arrive.”</i></p>  |
| Changes for 2022 | <p><b>Relaunch a tiered incentive offer.</b> A tiered incentive model encourages building owners and facility managers to include more residential unit owners and rental units 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. From Q3 2020 through Q1 2021 the Company launched its first iteration of a tiered incentive to customers. The offering increased interest in the multifamily program however due to COVID-19 implications, participation did not increase as much as anticipated at the time. However, due to positive customer feedback, the Company plans to relaunch this opportunity and restructure incentives as appropriate to increase program attractiveness to customers. For example, one of the goals of this offer is to motivate customers to move forward with deeper, more comprehensive measures. Since deeper measures typically include a copayment (specifically for the Market-Rate Multifamily Program), the offer will help to reduce copayments if the customer moves forward with a more comprehensive contract. This approach also helps the customer to realize, ideally, all available savings opportunities. The Company plans to work with the lead vendor to review and relaunch the tiered incentive offer in early 2022 to ensure a strong pipeline.</p> <p><b>Increase contractor participation.</b> In 2021 the Company tested a bring-your-own-subcontractor approach with Air Source Heat Pumps. This approach will provide customers with greater choice, open energy efficiency project opportunities to more contractors which may drive down project costs, improve the quality of installations, and increase participation among all multifamily facilities. The Company will consider expanding this subcontractor model to other aspects of the Multifamily Program in 2022. Success will be based on customer satisfaction and an overall increase in ASHP installations in 2021.</p> <p><b>Implement recommendations from Multifamily Impact and Process Evaluations.</b> The Company received results from the Impact and Process Evaluation of the Market Rate and Income Eligible Multifamily Programs in September 2020. The process evaluation examines customer participation, vendor participation, and overall program processes. For 2022, the Company plans to utilize the results</p> |

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|  | <p>of this evaluation to make several improvements to the program design of the multifamily programs.</p> <ul style="list-style-type: none"><li>• Firstly, the Company will work with its multifamily lead vendor to increase facilitation of health and safety barrier remediation by providing customers with more information about how to complete remediation, how to locate a local remediation contractor, and financing options available.</li><li>• Secondly, the Company will set clearer program expectations with customers by updating content and redesigning the website landing pages and program brochure. (See marketing and outreach enhancements below for additional details)</li><li>• Thirdly, the company will work with the lead vendor to identify whether a long-term role of virtual energy assessments in multifamily buildings is feasible.</li></ul> <p><b>Leverage market research studies to better identify and segment Multifamily customers.</b> Based on the findings of the forthcoming RI Multifamily Census Study and Non-participant Study, both estimated to be completed by the end of Q1 2022 (see Upcoming Evaluations below), the Company plans to implement targeted outreach and marketing efforts to newly identified customers representing large apartments, five to 20 unit small- and medium-sized multifamily owners, newly identified income eligible properties, and other properties that have not been served by the programs to date. As research becomes available prior to the completion of the studies, the Company will have the opportunity to incorporate insights to enhance the program design and implementation of the market-rate and income eligible multifamily programs. Specifically, the Company will leverage research pertaining to how tax incentives could impact landlord and property owner participation in the Multifamily Program. The Company has included this topic in the on-going Non-Participant Study and will also commit to further researching how a tax incentive program for landlords and property owners could equitably increase program participation and better serve renters within the Multifamily Program. This research will first include the exploration of similar programs throughout the country to understand the program design, funding, and overall benefits.</p> <p>In addition, the Company continues to leverage other market research as it becomes available. For example, in 2021 the Company will be selecting a vendor to lead qualitative customer interviews with residential customers based on their experience and satisfaction with the energy efficiency program(s) they participated in. Similarly, the Company also lead research in early 2021 to understand the type of marketing channels and messaging that will resonate most with customers as customers regain a sense of normalcy following Covid-19. This research helps the Multifamily Program</p> |
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|  | <p>to ensure offerings are aligned with customer needs. For example, property managers who were interviewed in early 2021 noted that any out-of-pocket expense for energy efficiency upgrades was something they could not justify at the time as their primary focus was to receive regular rent payments from tenants in the near-term. With this information, the Company sees value in exploring solutions specifically for landlords and property managers to help offset project copayments.</p> <p><b>Research customer motivators.</b> The Company has incorporated questions with regards to the potential value of tax incentives into the Non-participant Study that is underway and estimated to be completed in Q1 2022. Including questions pertaining to potential motivators such as tax incentives in this research will help the Company to understand and identify potential new drivers and motivations for increasing customer participation in multifamily programs in future years. If customer feedback deems tax incentives to positively impact participation, the Company will further explore this opportunity and work with external stakeholders to determine the feasibility of creating this type of opportunity for multifamily owners. Additionally, based on stakeholder feedback, the Company is exploring how Non-Energy Impacts (NEIs) such as health and safety benefits could increase program attractiveness and increase participation. For, example, the Company sees value in leveraging the research from a recent Health and Safety NEI Study Massachusetts recently completed (more detail provided below in “Upcoming Evaluations”).</p> <p><b>Improve customer financing options.</b> 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 2022, the Company will explore an option that will provide financing options for landlords and/or property managers 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. Specifically, a financing option could increase multifamily participation within the five-20 unit building segment if the upfront co-pay cost were able to be financed over time.</p> <p><b>Training &amp; Upskilling:</b> As the Multifamily Programs shift from inexpensive, direct install measures to more complex and expensive measures, energy assessors 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 will continue to invest in relevant professional development opportunities for energy assessors in the Multifamily Programs. The Company believes these</p> |
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|  | <p>trainings should increase the amount of deeper energy savings measures adopted by multifamily participants. In 2021, The Company organized a workforce development training for 10 auditors from the lead vendor to attend. The subject matter of the training provided individuals with sales training when discussing deeper measures with customers and the benefits associated when installing the measures. Based on the positive feedback from our lead vendor, this training will continue to be offered as a refresher training on an annual basis to our Lead Vendor and other potential sub-contractors, as appropriate. Below are quotes provided from the Program’s lead vendor based on their experience attending the sales training:</p> <p><i>“Mark (the instructor) packs a lot of information in these seminars and bullets the key take-aways from each lesson. I have found it to be productive and worthwhile as I have worked towards incorporating these strategies in my day-to-day outreach efforts.”</i></p> <p><i>“I have re-listened to them for topics regarding the promotion of MF initiatives for overcoming client objections and strategies to help prospects look at other ancillary benefits of taking advantage of the utilities offerings”</i></p> <p><i>“It is very helpful that we can access them anytime. I find the lessons engaging and something to add to my toolbox when out in the field. They do not try and cram too many things into 1 lesson which I like about the training, easier to retain.”</i></p> <p><i>“I have found Mark Jewell’s Selling in 6 sales training to be very helpful and user friendly. I can listen to one of these short courses on my way to work or during a break at the office on my phone. Mark packs a lot of information in these presentations of which I can usually pull out 1 of 2 ideas that I can incorporate in my outreach efforts to the multi-family clients we serve. What I like most is that it’s easy to follow and beneficial across all departments and positions making anyone who listens a better spokesman for promoting the utilities EE services offered each time we interact with our clients and prospects.”</i></p> <p>Additional Workforce Development training will be considered and offered throughout the program year. Recognizing training may benefit all residential programs, The Company will coordinate across programs to ensure Workforce Development training is offered to all lead vendors, Sub-contractors, etc. as needed.</p> |
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|  | <p><b>Marketing and outreach enhancements.</b> In 2020 and 2021 the Company co-branded marketing collateral with the lead vendor following the Company’s co-branding guidelines. The Company’s marketing team collaborated with the lead vendor’s marketing team when developing customer collateral for the Tiered Incentive pilot. The Company sees value in leveraging a co-branding approach moving forward with the program’s lead vendor, especially for piloted offers to customers.</p> <p>Additionally, adopting a market segmentation approach based on the analysis from the Multifamily Census, the Company sees value in enhancing its Multifamily and Income Eligible Multifamily marketing and outreach efforts in 2022 with the goal of creating collateral specifically for large apartments, small and medium five-20 unit buildings, trade allies, unit owners, and income eligible properties with the goal to offer customers deeper transparency and clarity of program offerings based on the building type.</p> <p>In an effort to engage the Multifamily and Income Eligible Multifamily target with a customized approach, we are exploring different tactics that provide opportunities to offer relevant content in a more personalized way. For 2022, we are planning to create a custom content hub that is connected to an industry specific publication. Content hubs offer a unique opportunity to showcase our industry expertise and segment the content based on specific audiences and building type making a personalized user experience. Continuing with the connection to industry publications, we want to explore industry specific events targeting property owners/managers that we can sponsor and also take part in as a speaker or as part of a panel. Complimenting the aforementioned tactics, we want to refresh both the Multifamily and Income Eligible Multifamily landing pages. The refresh is a critical component to the customer journey and continues to provide an opportunity to customize the experience for the different target of customers and meet their desire for more information.</p> <p>The company will work with the lead vendor to identify customer(s) that may be interested in having a case study developed based on their experience as a participant in the Multifamily program and/or Income Eligible Multifamily program. The goal of the case study will be to highlight the customer journey when going through the program(s), the benefits of the program, and savings the customer realized by participating in the program (both energy and cost savings). The case study is a way to highlight program successes which will aim to resonate with prospective customers in Rhode Island. The case study will be posted on the Company’s website and infused into the program’s 2022 marketing collateral as appropriate.</p> |
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|                              | <p>Finally, the Company will provide the lead vendor with scripts in the case property owners have questions about the Company’s role around potential building code issues. The Company will also revisit co-branding marketing with the lead vendor and will consider more prominent Company placement with the goal to increase customer trust, ease, and ultimately increase program participation.</p> <p><b>Program evolution.</b> The Company will continue exploring ways to assist customers to overcome pre-weatherization barriers. Specifically, the Company will work with the lead vendor to create a step-by-step resource including a list of program allies and/or contractors that can perform the necessary pre-weatherization work needed to be completed for a customer to be able to participate in the Company’s Multifamily Program. The Company will work with the programs’ lead vendor to determine the most effective way to provide this resource to customers. Additionally, given the lighting market’s transformation, 2022 will be the last year lighting savings can be claimed through the Multifamily Programs and as such, the Company will explore emerging technologies that could bring cost effective electric savings to the program that go beyond savings opportunities currently offered through the program. The Company is examining a variety of technologies to serve a range of multifamily customers and building types. For example, some large apartment buildings may benefit from building monitoring-based commissioning (MBCx), similar to the MBCx pathway of the ESPO program. Some MBCx service providers specialize in serving the unique needs of multifamily buildings and occupants, providing energy, water, and comfort benefits. Other buildings with old steam heat systems may benefit from radiator enclosures, which can save significant energy and increase occupant comfort for poorly balanced systems. Further, the Company anticipates findings from the ongoing 2021 Pre-Fab Whole House Energy Refurbishment Assessment will have some findings relevant for the Multifamily Program. It is prudent for the Company to explore emerging technologies such as the ones noted above in order for the Company to continue to meet its savings goals. For example, in 2019 lighting made up 18% of the Multifamily Program’s total net annual savings across all fuel types.</p> |
| <p>Rationale for Changes</p> | <p>From 2018 through 2020, the Multifamily Program’s energy savings goals have been challenged due to a rapid decline in lighting opportunities and reduced opportunities in large multifamily buildings due to market saturation.</p> <p>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</p>  |

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|                      | <p>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 EnergyWise 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.</p> <p>In order for this program to meet its goals in 2022 and beyond, in the program must continue to focus to include both large apartment buildings along with condos and smaller (5-20 unit) apartment buildings. It is also critical that the program be able to transition from a reliance on energy savings from direct install measures to more comprehensive energy retrofits. The changes proposed in this plan focus on these important changes to the multifamily market as well as overall customer experience and process improvement.</p>  |
| Upcoming Evaluations | <p><b>Multifamily Census Study:</b> In 2021 the Company went out to bid and selected a vendor to 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.</p> <p><b>Nonparticipant Study:</b> In 2021 the Company went out to bid and selected a vendor to execute a Nonparticipant Study. The objective of the Nonparticipant Study is to provide in-depth research to characterize customers that have not participated in National Grid’s Rhode Island residential programs, assess barriers to their participation, and identify opportunities to engage them. The qualitative research will include characterization of customers, exploring barriers of participation, and understanding best communication channels to reach customers. The Nonparticipant Study will help the Company to understand how landlords, property managers, and tenants (both owner-occupied and renters) can be better engaged and served through the Multifamily Programs. The feedback from these qualitative interviews will be incorporated into the Company’s marketing and outreach strategy and the Company will also review what</p> |

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|  | <p>program design elements could be enhanced to improve customer ease and ultimately increase participation.</p> <p><b>Non-Energy Impact Study:</b> The objective of this study is to quantify and monetize the health and safety-related NEIs attributable to improvements in the energy efficiency of income eligible multifamily buildings. The study looks into the monetization of valuing the impacts of weatherization services on program recipients by calculating money saved, or the dollar value of costs avoided, due to changes in health issues and household budgets resulting from weatherization. The initial findings show successful monetization of NEIs occurred for arthritis, thermal stress (cold), home productivity, and reduced fire risk. Although this study was focuses primarily in Massachusetts, there are learnings that apply to Rhode Island’s income eligible multifamily buildings and as such the Company sees value in utilizing resources efficiently to apply learnings of this study to the Income Eligible Multifamily program in Rhode Island once the results of the study are finalized. The final results of the study are expected to be released in August 2021.</p> |
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**Market Rate Multifamily – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 20,783                  | 1,424                 | 143   | 96,255                                      | \$3,271        | 3,600         |

**Market Rate Multifamily – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 147,064              | 8,279              | \$1,489        | 4,000         |

**Income Eligible Multifamily – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh<br>(Electric) | Annual MWh<br>(Electric) | Annual Passive<br>Demand<br>Reduction kW<br>(Electric) | Lifetime<br>MMBtu<br>(Electric<br>Gas, Oil,<br>Propane) | Budget<br>(\$000) | Participation |
|----------|----------------------------|--------------------------|--|---|-------------------|---------------|
| Electric | 24,309                     | 1,538                    | 49   | 108,858   | \$3,536           | 3,600         |

**Income Eligible Multifamily – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime<br>MMBtu<br>(Gas) | Annual<br>MMBtu<br>(Gas) | Budget<br>(\$000) | Participation |
|-----|----------------------------|--------------------------|-------------------|---------------|
| Gas | 273,085                    | 14,700                   | \$2,949           | 3,150         |

#### 4. Income Eligible Services (Electric and Gas)

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| <p>Eligibility Criteria</p> | <p>The Income Eligible Services (IES) Program serves Rhode Island homeowners, renters, and landlords, who have a National Grid account and meet the any of following criteria:</p> <ul style="list-style-type: none"> <li>• Household income equal to, or less than, 60% of Rhode Island's State Median Income Levels which are set each program year<sup>4</sup> <b>or</b> enrolled in National Grid's fuel discount rate plans, Electric A-60 rate and/or Gas 11, 13 rates<sup>5</sup>.</li> <li>• Customers enrolled in the Low-Income Home Energy Assistance Program (LIHEAP)<sup>6</sup>, also known as "fuel assistance".</li> <li>• Homeowners and renters who live in a one to four unit building with either an electric or gas National Grid Discount Rate account can participate, including customers with delivered fuel heat (oil, propane, wood, or coal) if they have an electric account.</li> <li>• Additional eligibility criteria, including the 50% rule,<sup>7</sup> 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.</li> </ul> |
| <p>Offerings</p>            | <p>IES consists of two, no-cost<sup>8</sup>, in-home or virtual services to increase comfort in the home and decrease a customer's energy costs.</p> <p><b>Appliance Management Program (AMP) Assessment</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>   |

<sup>4</sup> <http://www.dhs.ri.gov/Programs/LowIncomeGuidelines.php>.

<sup>5</sup> <https://www.nationalgridus.com/RI-Home/Bill-Help/Payment-Assistance-Programs>

<sup>6</sup> <https://www.benefits.gov/benefit/1572>

<sup>7</sup> 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".

<sup>8</sup> 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.

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|  | <ul style="list-style-type: none"> <li>• Installation of instant energy savings measures such as energy efficient LED bulbs, advanced power strips, water saving measures (faucet aerators and low-flow showerheads) and thermostats.</li> <li>• 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. <ul style="list-style-type: none"> <li>○ Replacement of eligible existing inefficient appliances (including delivery and installation)<sup>9</sup>.</li> </ul> </li> </ul> <p><b>Weatherization and Heating System Assessment</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Air sealing, duct sealing and insulation upgrades in attics, walls and basements.</li> <li>• 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.</li> <li>• 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.</li> </ul> <p><b>Virtual/Remote AMP Assessment</b></p> <p>In 2020, the COVID-19 pandemic prompted innovation with virtual/remote AMP Assessments allowing some program benefits to be delivered virtually. These virtual/remote assessments will remain as an option in 2022 for customers who prefer this service. The virtual assessment provides multiple options for an energy specialist to communicate energy savings information depending on customer familiarity with smart phone and video calling technologies. A video call can be used to guide the customer around their</p> |
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<sup>9</sup> 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.

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|                                    | <p>home so an energy specialist can assess the home’s energy use. If the customer is not able to use video, the specialist will have the customer send in pictures (before or after the virtual AMP) of important areas such as the attic, heating and water heating system, and basement crawl spaces while walking through the assessment by phone. Customers participating in the virtual/remote AMP Assessments receive the energy saving devices traditionally installed by the energy specialist during the in-home visit through the mail. The virtual AMP serves as a pre-assessment for the weatherization services to identify opportunities and barriers before sending a weatherization team to the site. Customers who choose the virtual AMP are sent no-cost energy efficient LED bulbs, power strip and faucet aerators and they are able to self-install the products or they can be installed by the energy specialist during the weatherization assessment.</p> <p>In 2021 customers were able to choose whether to have an in-person assessment or a virtual assessment. Based on customer preference, about 40% of IES customers participated in the virtual AMP assessment in 2021.</p> |
| <p>Implementation and Delivery</p> | <p><b>Program Delivery:</b></p> <ul style="list-style-type: none"> <li>• IES Program is administered through a Lead Vendor (LV) that is responsible for managing the implementation of IES work through the six Rhode Island geographically-based Community Action Program (CAP) Agencies. In addition, the LV is engaged with all customers as they conduct post-inspections when jobs are complete for 100% of the customers.</li> <li>• The CAP Agencies serve as a trusted entity where income eligible customers can obtain essential resources within their respective community.</li> <li>• 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.</li> <li>• Other channels for enrollment in the IES Program are: <ul style="list-style-type: none"> <li>○ Low-Income Home Energy Assistance Program (LIHEAP);</li> <li>○ Community Expos;</li> <li>○ Consumer Advocate appointments; and</li> <li>○ National Grid’s Customer Service Center<sup>10</sup>.</li> </ul> </li> </ul>   |

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<sup>10</sup> (1-800-322-3223)



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|  | <ul style="list-style-type: none"><li>• The IES Program collaborates with the State of Rhode Island Department of Human Services (DHS) Weatherization Assistance Program (WAP)<sup>11</sup> and the Low-Income Home Energy Assistance Program (LIHEAP)<sup>12</sup> to create synergy between the programs, which improves outcomes of all the programs.<ul style="list-style-type: none"><li>○ Leveraged Funding: The IES Program benefits from leveraging LIHEAP funds, resulting in more customers being served. The amount of funds leveraged is approximately 25% 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 at end of section<ul style="list-style-type: none"><li>▪ Figure 8,</li><li>▪</li><li>▪</li><li>▪</li><br/><li>▪ Figure 9,</li><li>▪ Table 2 below for illustrative examples that represent 2012-2020 funding sources, allocation of funding sources, and services provided with funding sources, respectively.</li></ul></li><li>○ Starting in 2021, WAP (DOE) funding became available for leveraging IES funding for IES energy efficiency measures.</li><li>○ DHS provides training and equipment to weatherization auditors.</li><li>○ DHS provides the IES Program with important operational data including demographics, participation, amount of DHS funding leveraged with IES Program funds, and customer</li></ul></li></ul> |
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<sup>11</sup> overseen by the U.S. Department of Energy. <http://www.dhs.ri.gov/Programs/WAPProgramInfo.php>

<sup>12</sup> overseen by the U.S. Department of Health and Human Services. <https://www.benefits.gov/benefit/1572>

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|  | <p>data for those on fuel assistance (LIHEAP), but not the National Grid discount rate.</p> <ul style="list-style-type: none"> <li>• CAPs provide the full suite of energy efficiency services including: <ul style="list-style-type: none"> <li>○ Income-eligibility verification</li> <li>○ Customer education regarding energy and cost savings opportunities</li> <li>○ Energy assessments</li> <li>○ Installation of instant energy savings measures</li> <li>○ Recommendations for energy savings measures</li> <li>○ Coordination of home performance/HVAC contractors and appliance vendors that install weatherization, heating (space and hot water), window air conditioners and appliance measures. <ul style="list-style-type: none"> <li>▪ If the CAP Agency determines they cannot complete their pipeline of weatherization jobs, the CAP will refer the job to a third-party entity to do the weatherization. The LV works closely with the CAPs to regularly review weatherization pipeline and timeliness of job completion The referred jobs will get accounted for in the referring CAP Agencies participation and job completion goals.</li> </ul> </li> </ul> </li> <li>• Key Performance Metrics (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 &amp; gas weatherization and heating system installations and cost.</li> <li>• 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.</li> <li>• 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.</li> <li>• Monthly engagement of the Company, the Lead Vendor, Executive Directors of the CAPs, and DHS to review the overall performance</li> </ul> |
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|                   | <p>of the IES Program and coordination of best practices across the CAPs.</p> <ul style="list-style-type: none"> <li>On-going customer feedback and communication.</li> </ul> <p><b>Customer Journey:</b></p> <ul style="list-style-type: none"> <li>A customer begins the process for a no-cost home energy assessment by contacting (call/in-person) their local CAP Agency to submit their information to determine if they meet the income eligibility requirements for participation in IES.</li> <li>After the CAP Agency verifies income eligibility, the CAP will schedule a no-cost AMP or virtual 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 2022 the CAPs will continue a process using two-person teams where applicable to provide all energy assessment services in one visit.</li> <li>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.</li> <li>If needed, health and safety services will be provided including replacing smoke and CO detectors if non-functioning or expired, clean and tune heating systems, and address conditions such as mold before the EE work is able to be completed.</li> <li>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.</li> <li>Customer receives a “comment card” to provide their feedback on all aspects of their journey through the IES Program.</li> </ul> |
| Customer Feedback | <p>In 2020, the IES Program began a new post-installation survey for weatherization and heating system services to complement the existing AMP Assessment customer survey.</p> <p>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 customer feedback card. To</p>  |

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|                         | <p>date in 2021, 100% of customers who responded were satisfied with the IES services (compared to 95% in 2020), 100% of customers who responded were satisfied with the improvements to their homes (compared to 96% in 2020), and 98% of the customers who responded were satisfied with the professionalism of the CAP employees (compared to 100% in 2020), (2021 n=41).</p> <p>The Lead Vendor provides a tabulation of the survey results, and the anonymized data is presented at the IES Quarterly Best Practices meetings and the Executive Director meetings. Discussing the data as a whole at the IES Best Practices meeting allows the opportunity to create solutions if problems exist, position CAPs to help other Agencies if needed, as well as celebrate the success of the collective efforts of the six CAPs.</p> <p>The IES lead vendor conducts post-inspections on 100% of all jobs and has the opportunity to talk one-on-one with the customer to get feedback, gauge satisfaction and identify areas for improvement.</p>   |
| <p>Changes for 2022</p> | <p>In 2021, the IES Program implemented a process to provide CAP Agencies with access to an experienced third-party weatherization vendor to expand the CAPs capacity to readily complete weatherization jobs and improve equity across CAP territories. Due to the COVID-19 pandemic, the third-party vendor model took longer than expected to establish and to test. As this new model was implemented in 2021, ongoing improvements have been made to the to provide timely and seamless services between the CAPs and the vendor with the biggest focus being on the length of time to complete the weatherization jobs. In 2022 this model will continue to serve as a resource for CAPs to serve more customers, but also as a resource for CAPs who fall below performance thresholds including quantity of outstanding jobs, and length of time of pipeline for customers to be served. These metrics will be determined first quarter of 2022 Lessons learned from this third-party vendor model from 2020 and 2021 will be used to develop an RFP for these services in 2023. Determination of success of this model will include:</p> <ul style="list-style-type: none"> <li>• CAPs meeting/exceeding year end weatherization participation goals. Each year, goals are based on the total weatherization goals divided by the number of eligible customers in the agency territory. Both numerical goals and spending goals are determined for each CAP and are measured and communicated throughout the year.</li> <li>• Improved timeliness for completion of weatherization services.</li> </ul> |

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|  | <ul style="list-style-type: none"><li>• Timeline from recommendation to completion of weatherization job and customer satisfaction.</li></ul> <p>Due to the impact of the COVID-19 Pandemic on the IES population in 2020 and 2021, several improvements that were recommended in <b>2019 Process Evaluation</b> will remain a focus in 2022. Specific focus will remain on the following key areas.</p> <ul style="list-style-type: none"><li>• Rebuild and stabilize <b>the number of qualified AMP/weatherization and heating assessors</b>. Due to workforce layoffs, furloughs, extended unemployment benefits, and workforce transition, the CAP Agencies' workforce was significantly impacted. The IES Program will prioritize assisting CAPs to train, hire and retain assessors. Indicators of success include training and hiring new assessors and regularly tracking the number of assessors</li><li>• <b>Focused communication and engagement with landlords</b> on behalf of interested tenants. The Company aims to increase renter participation, via landlord outreach, to effectively improve the equitable share of program resources.</li></ul> <p>In 2021 a working group convened to examine the <b>IES emergency heating system replacement</b> for income eligible customers that heat with oil or propane. The desired outcome of the working group is to 1) reduce the number of emergency oil/propane heating system replacements (replacing oil/propane heat systems with high efficiency oil/heat systems), and 2) find supplemental funding that can offset the cost of fuel switching from oil/propane to high efficiency heat pumps heating systems. In order to achieve this, in 2022, the IES Program will develop a list of oil/propane systems they observe during on-site and virtual energy assessments and will work with supporting stakeholders (RI OER, DHS, DOE, and others) to identify funding that can be leveraged to replace oil/propane heating systems with high efficiency heat pumps. At the time when fuel switching can be done, the IES Program will determine if a dedicated team of contractors can be designated for emergency replacements so that homes can be weatherized, heat pumps systems specified, sized, and installed in a shorter time period than is currently possible during emergency heating system replacement season.</p> |
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|                              | <p>The program will <b>implement a training process for offering smart thermostats to homes with central AC to improve energy efficiency and operability</b> and align with ConnectedSolutions when possible.</p>   |
| <p>Rationale for Changes</p> | <p><b>Increase completion of weatherization jobs:</b> In the income eligible housing stock, it is common for maintenance and/or improvements to be deferred due to many possible factors including cost, time, lack of information, concern about potential code violations and/or undocumented status, existing conditions preventing weatherization, etc. Weatherization of a home is the priority to prevent energy loss through cracks, holes, and uninsulated walls. Insulating a home saves energy and money and improves thermal comfort for the occupants. By having a third-party vendor available to assist the CAP Agencies in completing weatherization jobs means more energy savings, less cost for customers, and if necessary, may result in smaller heating and cooling systems if replacement is needed.</p> <p><b>Stabilize the number of qualified AMP/weatherization and heating assessors:</b> 2020 and 2021 resulted in the loss of several AMP/weatherization and heating assessors due to many factors. Due to the IES Program requirements, hiring new staff can take several months. The IES Program poses several hurdles for new staff as the required training is time-intensive, all assessors going into a home have to pass a background check, and then the assessor has to gain in-field experience. To help to filter potential applicants and streamline the hiring process, the IES Program is working with Rhode Island Builders Association to develop a comprehensive training program that will set the path for a person to obtain the necessary training to apply for an energy assessor position. This program will be launched in 2021 and be fully instituted in 2022. Maintaining qualified assessors is critical to the success of the IES Program as the time it takes to hire and train an assessor can significantly impede an Agency from completing any energy efficiency work.</p> <p><b>Focused communication and engagement with landlords:</b> Landlord participation in the IES Program is important for the success of reaching potentially older homes that often have deferred maintenance. In 2022 the IES Program will develop a targeted communication and marketing strategy aimed at landlords to improve their trust in the IES Program, share examples of similar projects, effectively communicate all the short-term and long-term benefits. Without landlord commitment to the IES Program, renters cannot gain the benefits of energy efficiency which causes an issue</p> |

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|                               | <p>with equity of program resources. Success for this improvement will include the number of types of channels for communicating with landlords, and the number of landlords that move forward with the IES Program.</p> <p><b>IES emergency heating system replacement:</b> Currently, if an income eligible customer heats their home with oil or propane and they have a heating system failure or the system is deemed unsafe, the original oil or propane heating system is replaced with a more efficient oil or propane heating system. This 1:1 replacement is the most efficient solution to satisfy the emergency nature of a customer’s heating needs. Ideally the Program would prefer to upgrade the oil/propane heat systems with more energy efficiency heat pumps, however the RI EE Programs are not able to provide fuel switching with ratepayer funds. Even if fuel switching was allowed, the time to design and install a completely different system takes many weeks, and a customer cannot be without heat for many weeks in the winter. It is important to note other barriers for heat pumps are that not all homes are well-suited for ASHPs; the IES Program pays for 100% of equipment, labor and inspection costs, which can become very expensive for fuel switching. The PUC recommended that the Company look into possible solutions to stop the installation of new oil/propane heating systems for emergency heating system replacements as they perpetuate the burning of carbon-intensive fuels. A working group, convened to address this topic, provided recommendations to reduce the number of oil/propane heating system replacements and to identify funding sources for paying for the fuel switching.</p> |
| Proposed Upcoming Evaluations | None planned for 2022. In 2019, Cadeo conducted a Process Evaluation for the Income Eligible Services Program and which built off a report conducted by The Cadmus Group in 2014.  |
| Notes                         |  |

**Income Eligible Services – Single Family– Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|------|-------------------------|-----------------------|---|---|----------------|---------------|
|      |                         |                       |   |   |                |               |

|          |        |       |     |         |          |       |
|----------|--------|-------|-----|---------|----------|-------|
| Electric | 38,506 | 3,314 | 480 | 358,466 | \$13,265 | 3,583 |
|----------|--------|-------|-----|---------|----------|-------|

**Income Eligible Services – Single Family- Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime<br>MMBtu<br>(Gas) | Annual<br>MMBtu<br>(Gas) | Budget<br>(\$000) | Participation |
|-----|----------------------------|--------------------------|-------------------|---------------|
| Gas | 218,847                    | 10,942                   | \$6,372           | 1,098         |

Figure 8. 2012-2020 Funding Sources - Single Family Income Eligible EE Services

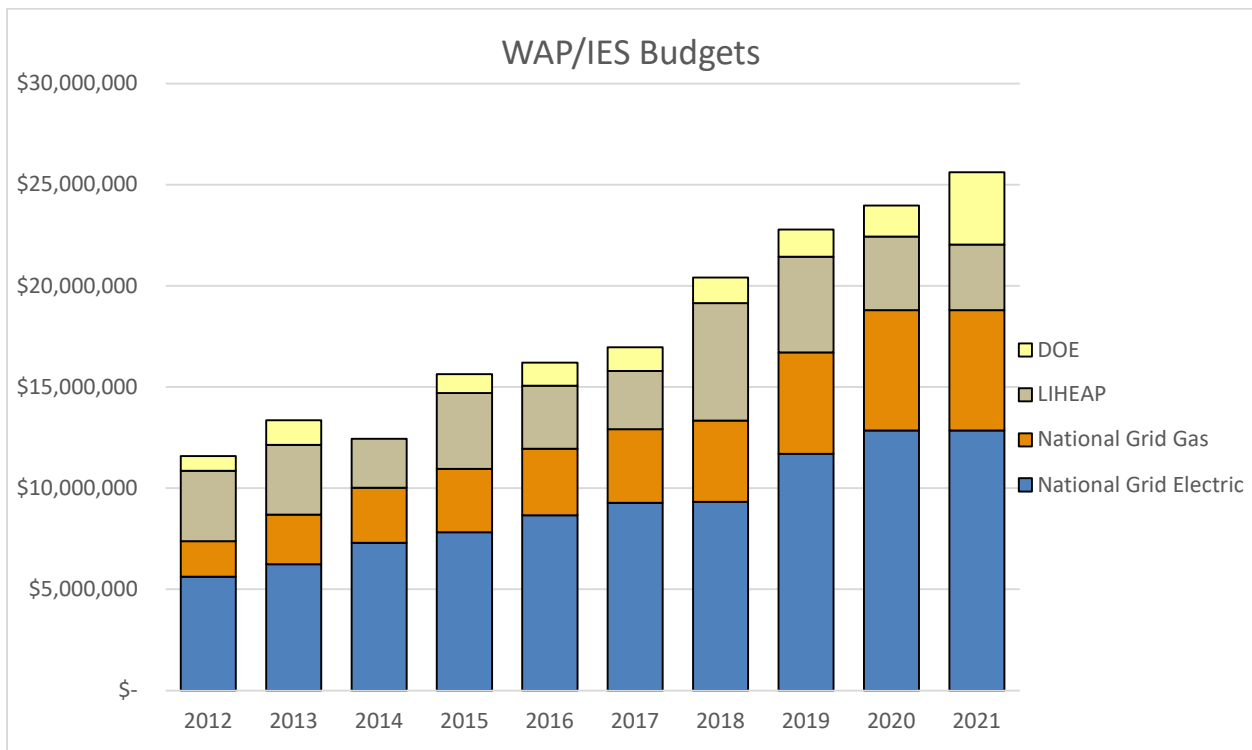




Figure 9. Allocation of Funding Sources - Single Family Income Eligible EE Services

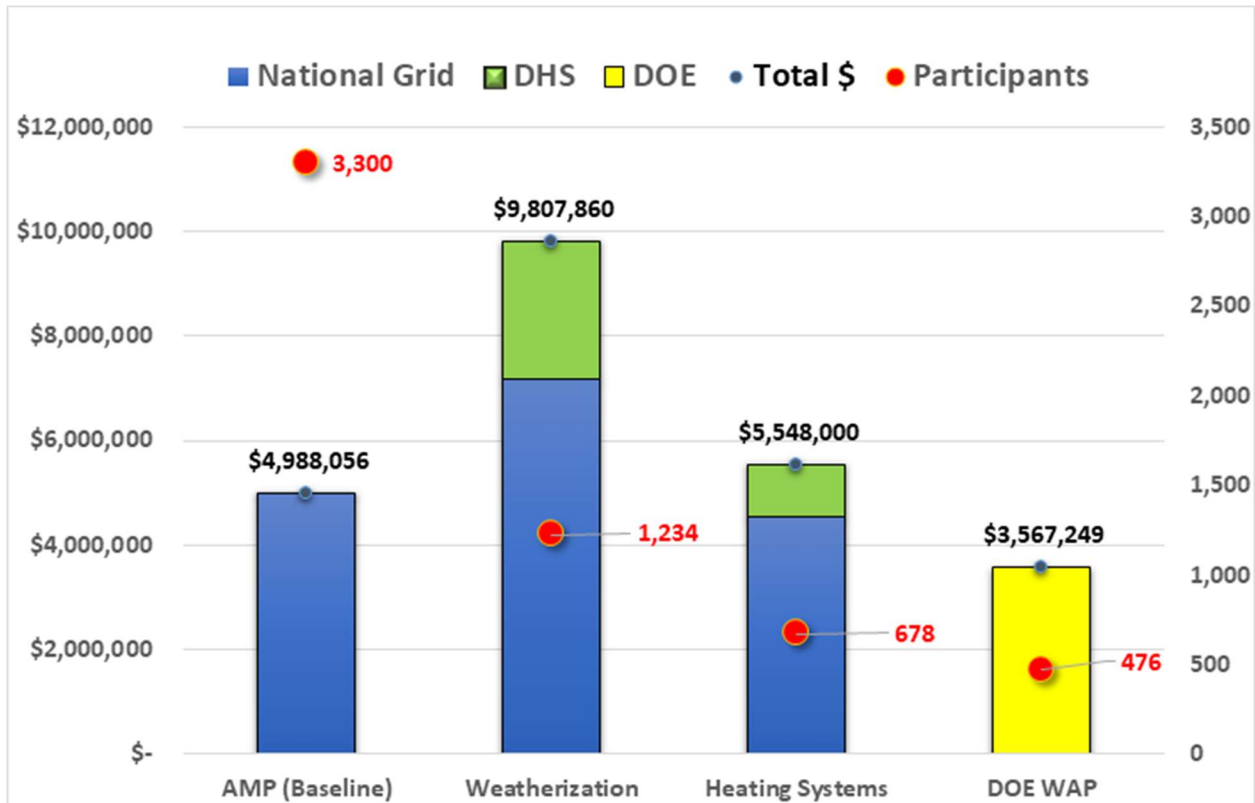


Table 2: Services Provided – IES Program and Low-Income Home Energy Assistance Program

| Single-Family Income Eligible Services (IES) Program*  | Low-Income Home Energy Assistance Program (LIHEAP)*  |
|--|--|
| <ul style="list-style-type: none"> <li>• Conduct whole house Energy Assessment and provide customer education <ul style="list-style-type: none"> <li>○ Lighting and Appliance (AMP) Assessment</li> <li>○ Heating and Weatherization Assessment</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Conduct whole house audit/ energy efficiency evaluation for Heating Systems and Weatherization (not appliances)</li> <li>• Install weatherization measures (insulation, air sealing, duct sealing)</li> </ul> |

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| <ul style="list-style-type: none"> <li>• Review utility bills</li> <li>• Replace incandescent and halogen bulbs with LED bulbs</li> <li>• Install smart power strips and domestic hot water savings measures</li> <li>• Talk with homeowner about opportunities to save energy and money through upgrading appliances and mechanical equipment and weatherizing the home.</li> <li>• Coordinate the installation of weatherization measures and/or space/water heating system and air conditioning replacements if needed</li> <li>• Install weatherization measures if needed</li> <li>• Replace eligible appliances</li> <li>• Conduct field inspections and testing, i.e., quality assurance/quality control.</li> </ul> | <ul style="list-style-type: none"> <li>• Replace inefficient heating/cooling equipment if deemed eligible</li> <li>• Improve minor health and safety issues that are barriers to energy efficiency measures</li> <li>• Conduct field inspections and testing, i.e., quality assurance / quality control.</li> </ul> |
|---|---|

\*Both IES and LIHEAP offer all services and products at no-cost to the customer.

## 5. Residential New Construction (Electric and Gas)

|                             |  |
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| <p>Eligibility Criteria</p> | <p>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.</p>   |
| <p>Offerings</p>            | <p><b>Design and Construction Assistance</b></p> <ul style="list-style-type: none"> <li>• Energy modeling and design assistance to verify compliance with the RNC requirements and justify the respective incentives.</li> <li>• In-field training and inspections to verify compliance with the RNC requirements and promote efficiency in subsequent projects.</li> </ul> <p><b>Market Development</b></p> <ul style="list-style-type: none"> <li>• Technical training on high efficiency and Zero Energy building practices, as well as energy code compliance, to build necessary market capacities.</li> <li>• Training and certifying Home Energy Rating System (HERS) raters to increase the number of qualified raters based in RI.</li> <li>• 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.</li> </ul> <p><b>Incentives</b></p> <ul style="list-style-type: none"> <li>• Whole-home efficiency incentives for 1-50 unit buildings based on achieved level of efficiency and number of units. <ul style="list-style-type: none"> <li>○ Path to Energy Efficiency incentives ranging from \$200 to \$4,000 per home. <ul style="list-style-type: none"> <li>▪ Four efficiency tiers, with an entry threshold of 15% more efficient than baseline and progressive maximum air leakage requirements.</li> <li>▪ Additional incentive options of \$250-\$1,000 per home for all-electric home and \$100-\$200 per home for ENERGY STAR® certification.</li> </ul> </li> </ul> </li> </ul> |

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|-----------------------------|---|
|                             | <ul style="list-style-type: none"> <li>○ Path to Zero Energy Ready incentives ranging from \$500-\$1,500 per home in addition to Path to Energy Efficiency. <ul style="list-style-type: none"> <li>▪ Projects must meet a minimum base efficiency level, be all-electric, and achieve DOE Zero Energy Ready Home, Passive House, or equivalent certification.</li> </ul> </li> <li>○ Projects with &gt;50 units are eligible for custom incentives.</li> <li>○ Adaptive Reuse projects are incentivized based on a separate set of prescriptive measures tailored to mill conversion projects.</li> <li>● Certification incentives provided to support third-party verification of energy efficiency measures.</li> <li>● Equipment rebates for qualifying high efficiency heating, cooling, and hot water equipment.</li> <li>● Complimentary ENERGY STAR LED bulbs and WaterSense showerheads.</li> </ul>   |
| Implementation and Delivery | <p><b>Design and Construction Assistance, Incentives:</b> The RNC project pipeline is developed primarily through coordination with RI permitting departments, engagement of the building industry, and referrals from <i>EnergyWise</i> and Rhode Island Housing. A participating customer/project team begins the process by calling or emailing the RNC program. The project team meets with the RNC program team (led by a Lead Vendor), 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.</p> <p><b>Market Development:</b> RNC identifies opportunities to build necessary market capacities to advance toward Zero Energy Homes and delivers education and outreach programming designed to achieve this goal.</p> |
| Customer Feedback           | A survey will be conducted annually to program participants and/or the broader market targeted by this program to collect feedback.   |

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|                               | 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 2022              | In 2022, RNC will codevelop with the ENERGY STAR HVAC program a HVAC consulting service to support the high efficiency performance levels required to achieve standards such as Zero Energy and Passive House. This will include contractor training, design review, and in-field support.<br><br>Program content related to codes and standards will be refreshed to reflect the State’s code update expected in early 2022. |
| Rationale for Changes         | The changes for 2022 will continue to increase the visibility and effectiveness of all electric homes and significantly improve 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 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 14,947                  | 867                   | 74  | 97,027                                      | \$1,542        | 462           |

**Residential New Construction – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 64,899               | 3,610              | \$513          | 289           |

## 6. Home Energy Reports (Electric and Gas)

|                             |  |
|-----------------------------|--|
| Eligibility Criteria        | <p>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).</p>   |
| Offerings                   | <p>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 insights in 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.</p>   |
| Implementation and Delivery | <p>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.</p> <p>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</p> |

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|                               | <p>more about energy saving tips and their home’s energy consumption, they may log into the online portal and use the available tools.</p>   |
| Customer Feedback             | <p>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.</p> <p>The Lead Vendor completes a Customer Engagement Tracker (CET) annually to assess customer perception of the program. Some of the customer’s verbatim feedback from the CET include:</p> <p><i>“It gives me a comparison with other similar homes in the area and whether I need to be doing things different especially because of winter.”</i></p> <p><i>“I like that they send it to my computer so that I don't have to wait on the mail.”</i></p> <p><i>“I like the comparison between my usage and my neighbors and how much I save using solar.”</i></p>                            |
| Changes for 2022              | <p>In 2021 HER launched a targeted 1-click promotion module within digital HERs in Rhode Island which allowed the Company to quickly gather updated information on customer’s homes and provide personalized program recommendations. In 2021, multifamily customers were targeted, and responses provided additional learnings about the size of the multi-unit dwellings. The 1-click promotion results in a 10% click-to-open rate on the module (compared to avg. 3% eHER module click rate), driving energy efficiency program awareness, and establishing a pool of self-identified MF customers in 5+ units for future targeted marketing. The new 1-click promotion modules will continue in 2022. Areas of interest include collecting information on customers who cool their homes with a central air conditioning unit to promote purchase of Smart thermostats and Connected Solutions.</p> |
| Rationale for Changes         | <p>The goal of collecting additional insights on the customer’s home is to provide meaningful, specific promotions and energy savings tips that resonate with customer.</p>  |
| Proposed Upcoming Evaluations | <p>None are planned for 2022 as the program recently completed an impact evaluation in 2020.</p>   |

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| Notes |  |
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**Home Energy Reports – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh<br>(Electric) | Annual MWh<br>(Electric) | Annual Passive<br>Demand<br>Reduction kW<br>(Electric) | Lifetime<br>MMBtu<br>(Electric<br>Gas, Oil,<br>Propane) | Budget<br>(\$000) | Participation |
|----------|----------------------------|--------------------------|--|---|-------------------|---------------|
| Electric | 26,852                     | 26,852                   | 3,692  | 91,619  | \$2,641           | 323,248       |

**Home Energy Reports – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime<br>MMBtu<br>(Gas) | Annual<br>MMBtu<br>(Gas) | Budget<br>(\$000) | Participation |
|-----|----------------------------|--------------------------|-------------------|---------------|
| Gas | 93,548                     | 93,548                   | \$442             | 152,324       |



## 7. 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 come 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 2022 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 | <p>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, negotiated with manufacturers and distributors, and midstream, working with retailers, 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.</p> <p>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.</p> |
| 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 2022              | <p>The Company will <b>join the ENERGY STAR Retail Products Platform (ESRPP) in 2022</b> and test the process with the introduction of ENERGY STAR® most efficient clothes washers and refrigerators, two products that currently do not receive incentives. 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.</p> <p>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 once again include these offerings in the program.</p> |
| Rationale for Changes         | <p><b>ESRPP:</b> The ESRPP allows 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.</p>   |
| Proposed Upcoming Evaluations | No planned evaluations for 2022.   |
| Notes                         |  |

**Residential Consumer Products – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 47,554                  | 6,885                 | 1,118   | 165,981                                     | \$2,837        | 34,962        |

## 8. Residential High-Efficiency Heating, Cooling, and Hot Water (Electric and Gas)

|                             |  |
|-----------------------------|--|
| <p>Eligibility Criteria</p> | <p>Residential High-Efficiency Heating, Cooling, Ventilation and Hot Water (ENERGY STAR® HVAC) serves all residential customers by offering incentives on high-efficiency building space conditioning and water heating equipment and equipment maintenance. Energy efficient equipment must be installed by a licensed heating or cooling contractor or plumber.</p>  |
| <p>Offerings</p>            | <p>The High-Efficiency Heating, Cooling, Ventilation and Hot Water Programs (HVAC Programs) promote and incentivize the installation of high efficiency electric and gas equipment through:</p> <ul style="list-style-type: none"> <li>• Customer rebates on energy efficient equipment <ul style="list-style-type: none"> <li>○ Boilers</li> <li>○ Combined condensing boilers</li> <li>○ Furnaces</li> <li>○ Hot water heaters</li> <li>○ Heat recovery ventilators</li> <li>○ Air source heat pumps (space and water heating)</li> <li>○ Air Conditioners</li> <li>○ Smart thermostats <ul style="list-style-type: none"> <li>▪ Ability to enroll in the ConnectedSolutions demand response program for additional energy savings</li> </ul> </li> </ul> </li> <li>• Quality Installation Verification</li> <li>• Contractor training</li> <li>• Contractor incentives</li> <li>• Upstream incentives (discount taken at the distributor level)</li> <li>• Heat Loan Financing</li> </ul> <p>Customers who complete a Home Energy Assessment through the EnergyWise Program can apply for 0% Heat Loan financing for qualified high-efficiency space heating and cooling and hot water equipment upgrades.</p> <p>The HVAC Electric and Gas Program is cross-promoted through the EnergyWise Home Energy Assessment, Multifamily, Residential New Construction, Community-Based Initiative 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</p> |

|                                    |  |
|------------------------------------|--|
|                                    | <p>contractor skills for accurate sizing, design, installation and performance verification of the high efficiency HVAC systems.</p>   |
| <p>Implementation and Delivery</p> | <p>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.</p> <p>Contractor training and education is a primary component of the program to ensure accurate sizing, design, installation and performance verification of heating, cooling, and hot water equipment and results in energy savings and customer satisfaction.</p> <p>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.</p> <p>The Company and Lead Vendor work with manufacturers to develop special offers, or “flash sales”, to further incentivize customers to participate in the Program to gain the benefit of the energy savings.</p> <p>Product channels for ease of customer use and for product adoption:</p> <ul style="list-style-type: none"> <li>• EnergyWise single family or multifamily programs</li> <li>• HVAC contractors during routine maintenance service, emergency service, or contractors’ marketing communications</li> <li>• Residential New Construction/Major Renovation energy advisors during project design consultation.</li> <li>• Upstream and midstream incentives</li> <li>• Comprehensive National Grid Energy Efficiency marketing channels including emails, Home Energy Reports, bill inserts and radio and media advertisements.</li> <li>• RI Online Marketplace <a href="https://ri.home.marketplace.nationalgridus.com">https://ri.home.marketplace.nationalgridus.com</a> offers customers the ability to purchase instant discount rebates on energy efficient thermostats and water fixtures.</li> <li>• The program supports a combination of upstream and midstream incentives as well as post-purchase consumer incentives. The upstream and midstream incentives encourage retailers,</li> </ul> |

|                   |  |
|-------------------|--|
|                   | <p>distributors and manufacturers to support ENERGY STAR products 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.</p> <ul style="list-style-type: none"> <li>• Implement a customer optimization strategy to identify electric resistance heated homes where air source heat pumps and heat pump water heaters would be ideal solutions. <ul style="list-style-type: none"> <li>○ The <i>EnergyWise</i> Program sends heating, cooling and hot water recommendations to the HVAC Lead Vendor. The HVAC Lead Vendor then sends an email to customers to offer assistance in moving forward with energy efficiency recommendations.</li> <li>○ The Home Energy Reports sends targeted communications to electric heat customers promoting air source heat pumps as an energy efficiency solution.</li> </ul> </li> </ul> <p>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.</p>                 |
| Customer Feedback | <p>The Company’s HVAC Lead Vendor has quality assurance (QA)/quality control (QC) staff who perform onsite inspections and engage with customers to obtain feedback and/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.</p> |

|                              |   |
|------------------------------|---|
| <p>Changes for 2022</p>      | <p>In both the electric and gas HVAC Programs, the HEAT Loan has been added to the Program budget.</p> <p>In the Gas HVAC Program, the lower efficiency boiler and combo condensing measures were removed to increase participation in the higher efficiency boiler and combo condensing measures.</p> <p>The HVAC Gas program will coordinate with the <i>EnergyWise</i> Program on offering a bundled incentive for customers that have received recommendations to do both weatherization and gas heating system upgrades. The bundled incentive will allocate additional incentive funds toward weatherization for the customer when they also do the heating system upgrade.</p> <p>The HVAC Electric program will coordinate with <i>EnergyWise</i> on Concierge Services for electric heat customers to identify customers who are ideal candidates for upgrading to heat pumps and help to walk the customer through the process.</p> <p>The Electric HVAC Program and the Residential New Construction/Major Renovations Program will work closely together to develop and implement an HVAC contractor training for the design and installation of heating/cooling/ventilation/hot water systems in projects striving to meet Zero Net Energy and Passive House.</p> <p>HVAC Contractors will be listed on the Program’s webpage as having completed the training and/or for the completing Zero Net Energy and Passive House projects.</p> |
| <p>Rationale for Changes</p> | <p>In both the electric and gas HVAC Programs, the HEAT Loan has been added to the Program budget. Historically this budget was in the <i>EnergyWise</i> Program, however, to provide reflective budgets for the respective programs, the HEAT Loan budget was allocated across the Programs that utilize the incentive of interest buy-down of the loan.</p> <p>Removal of the lower tier Boilers and Combination Boilers to encourage customers to upgrade to the higher efficiency equipment.</p> <p>The HVAC Program will coordinate on strategic communication and technical support to assist HVAC contractors engage with Zero Net Energy and Passive House projects to ensure the mechanical system is ideally designed and installed to meet the very low energy requirements of the homes. Consideration of requirements for contractors to participate in Zero</p>   |

|                               |   |
|-------------------------------|---|
|                               | Net Energy and Passive House training or successful completion of a project to be listed as a Zero Net Energy and Passive House participating HVAC contractor.  |
| Proposed Upcoming Evaluations | <p><b>RI-22-RE-HPMeter – Mini-Split/Central Heat Pump Metering Study.</b> This study will update the savings estimates for the current rebate offerings for mini-split heat pumps, both going from standard heat pumps to high efficiency heat pumps and electric resistance to heat pumps, and ducted heat pumps going from standard heat pumps to high efficiency heat pumps in RI. This study would be in collaboration with MA and possible other states in the New England area.</p> <p><b>RI-21-RG-GasHPDemo – Gas Heat Pump Demonstration Evaluation.</b> 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.</p> |
| Notes                         |   |

**High-Efficiency Heating, Cooling and Hot Water – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 77,717                  | 4,620                 | 240   | 338,161                                     | \$4,487        | 5,229         |

**High-Efficiency Heating, Cooling and Hot Water – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime<br>MMBtu<br>(Gas) | Annual<br>MMBtu<br>(Gas) | Budget<br>(\$000) | Participation |
|-----|----------------------------|--------------------------|-------------------|---------------|
| Gas | 439,717                    | 26,740                   | \$3,732           | 3,062         |

**9. Residential ConnectedSolutions**

|                      |  |
|----------------------|--|
| Eligibility Criteria | <p>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.</p>  |
| Offerings            | <p><b>Thermostats</b></p> <p>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.</p> <p>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.</p> <p><b>Batteries</b></p> <p>The Company has offered a battery-enabled demand response program since 2019. There are six different smart inverter manufacturers supported in the program. The Company added two more inverter manufacturers since the summer of 2020. The inverters control the battery systems.</p> <p>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 supported in both the Net Metering and RE-Growth programs.</p> <p>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</p> |



|                             | <p>incentivized based on the average performance (kW) of their battery system over the 30 to 60 summer events each year.</p> <p><b>Pool Pumps</b></p> <p>Starting in 2022, the Company will offer a pool pump-based demand response program. This program will control internet connected pool pumps to automatically stop pumps 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.</p> <p>This program will control internet connected pool pumps. Customers will earn an enrollment incentive and an annual incentive for staying in the program.</p>  |                       |                    |                       |                        |                              |                         |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |
|-----------------------------|--|-----------------------|--------------------|-----------------------|------------------------|------------------------------|-------------------------|--|-----------------|------|------|------|------|------|------|------|--|----|-----|-------|-------|-------|------------------------------|-------------------------|--------|---------------------|------------------|--------------------|-----------------------|----------------|-------------|---------------------|---------------------|----|------|------------------------|
| Implementation and Delivery | <p><b>Thermostats</b></p> <p>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 2022, the program plans for an enrollment increase of 42%.</p> <table border="1"> <thead> <tr> <th rowspan="2">Number of Thermostats</th> <th colspan="6">Historic Numbers</th> <th>Proposed Number</th> </tr> <tr> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td></td> <td>96</td> <td>813</td> <td>1,674</td> <td>3,936</td> <td>4,526</td> <td>5,459<br/>(vs. 6,409 planned)</td> <td>9,101<br/>(42% increase)</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Device</th> <th>Enrolment Incentive</th> <th>Annual Incentive</th> <th>HEAT Loan Eligible</th> <th>Performance Incentive</th> <th>Demand Savings</th> </tr> </thead> <tbody> <tr> <td>Thermostats</td> <td>\$25 per thermostat</td> <td>\$20 per thermostat</td> <td>No</td> <td>None</td> <td>0.59 kW per thermostat</td> </tr> </tbody> </table> | Number of Thermostats | Historic Numbers   |                       |                        |                              |                         |  | Proposed Number | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |  | 96 | 813 | 1,674 | 3,936 | 4,526 | 5,459<br>(vs. 6,409 planned) | 9,101<br>(42% increase) | Device | Enrolment Incentive | Annual Incentive | HEAT Loan Eligible | Performance Incentive | Demand Savings | Thermostats | \$25 per thermostat | \$20 per thermostat | No | None | 0.59 kW per thermostat |
| Number of Thermostats       | Historic Numbers   |                       |                    |                       |                        |                              | Proposed Number         |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |
|                             | 2016   | 2017                  | 2018               | 2019                  | 2020                   | 2021                         | 2022                    |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |
|                             | 96   | 813                   | 1,674              | 3,936                 | 4,526                  | 5,459<br>(vs. 6,409 planned) | 9,101<br>(42% increase) |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |
| Device                      | Enrolment Incentive  | Annual Incentive      | HEAT Loan Eligible | Performance Incentive | Demand Savings         |                              |                         |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |
| Thermostats                 | \$25 per thermostat  | \$20 per thermostat   | No                 | None                  | 0.59 kW per thermostat |                              |                         |  |                 |      |      |      |      |      |      |      |  |    |     |       |       |       |                              |                         |        |                     |                  |                    |                       |                |             |                     |                     |    |      |                        |

**Batteries**

In this BYOD program, customers are free to purchase an inverter from any of the 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 even though generous incentives are offered in RI for batteries through other programs. For 2022 the Company is expecting a 50% increase in enrollments.

| Number of Batteries | Historic Numbers |      |                          | Proposed Number       |
|---------------------|------------------|------|--------------------------|-----------------------|
|                     | 2019             | 2020 | 2021                     | 2022                  |
|                     | 24               | 100  | 199<br>(vs. 300 planned) | 300<br>(50% increase) |

| Device    | Enrolment Incentive | Annual Incentive | HEAT Loan Eligible | Performance Incentive | Demand Savings |
|-----------|---------------------|------------------|--------------------|-----------------------|----------------|
| Batteries | None                | None             | Yes                | \$400/kW-year         | 6.6 kW         |

**Pool Pumps**

The pool pump demand response program will also be new in 2022. In 2021 Guidehouse completed a report showing that pool pumps could cost effectively be added to the Company’s demand response programs<sup>13</sup>.

In this BYOD program, customers earn an incentive for signing up for the program and for each year they stay in the program. In 2022 only one pool pump manufacturer may be supported by the Company’s DERMs. However, the Company expects this number to grow in 2023.

<sup>13</sup> [https://ma-eeac.org/wp-content/uploads/2021-Cost-Effectiveness-of-ADR-for-Residential-End-Uses-Final-Report-2021-07-19\\_CLEAN-1.pdf](https://ma-eeac.org/wp-content/uploads/2021-Cost-Effectiveness-of-ADR-for-Residential-End-Uses-Final-Report-2021-07-19_CLEAN-1.pdf)

|                               | <p>The Company has set the goal of enrolling 25 customers in to the pool pump program in 2022. Marketing for this program will be mostly through the pool pump manufacturer to customers who already have a supported internet connected pool pump, and to new customers considering the purchase of a new pool pump. The incentives will help to offset the incremental cost of customers installing an internet connected pool pump instead of a standard pool pump.</p> <table border="1"> <thead> <tr> <th>Device</th> <th>Enrolment Incentive</th> <th>Annual Incentive</th> <th>HEAT Loan Eligible</th> <th>Performance Incentive</th> </tr> </thead> <tbody> <tr> <td>Pool Pumps</td> <td>\$100 per utility account</td> <td>\$20 per utility account</td> <td>No</td> <td>None</td> </tr> </tbody> </table> | Device                   | Enrolment Incentive | Annual Incentive      | HEAT Loan Eligible | Performance Incentive | Pool Pumps | \$100 per utility account | \$20 per utility account | No | None |
|-------------------------------|---|--------------------------|---------------------|-----------------------|--------------------|-----------------------|------------|---------------------------|--------------------------|----|------|
| Device                        | Enrolment Incentive   | Annual Incentive         | HEAT Loan Eligible  | Performance Incentive |                    |                       |            |                           |                          |    |      |
| Pool Pumps                    | \$100 per utility account   | \$20 per utility account | No                  | None                  |                    |                       |            |                           |                          |    |      |
| 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 batteries and pool pump demand response measures.  |                          |                     |                       |                    |                       |            |                           |                          |    |      |
| Changes for 2022              | In 2022 the company will launch a pool pump-based demand response program. Additional detail about these new offerings is described in Offerings above.   |                          |                     |                       |                    |                       |            |                           |                          |    |      |
| Rationale for Changes         | Rhode Island is seeing an increase in the adoption of pool pumps. These devices can act as actively controlled distributed energy resources to shape the use of electricity to reduce the cost of running the grid for all customers.   |                          |                     |                       |                    |                       |            |                           |                          |    |      |
| Proposed Upcoming Evaluations | None.   |                          |                     |                       |                    |                       |            |                           |                          |    |      |
| Notes                         | <p>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). The Company is identifying and pursuing opportunities beyond what was identified by the Market Potential Study.</p> <p>The solar inverter demonstration study was started in 2021 and will continue into 2022 with an expected completion in the summer of 2022. This study looks to verify the energy savings in kWh and determine customer acceptance of the offering if converted to a full program offering in the future.</p>  |                          |                     |                       |                    |                       |            |                           |                          |    |      |

**Residential Connected Solutions – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Active Demand Reduction kW (Electric) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|--|----------------|---------------|
| Electric | 59.4                    | 59.4                  | 7,365  | \$1,802.2      | 4,178         |

## 10. Marketing, Outreach & Education

### 10.1 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 among residential customers, 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](http://www.nationalgridus.com) at any time (provided they have internet access). 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](http://www.need.org), as well as training to students and teachers in grades K-12.

### 10.2 Delivery, and New for 2022

During 2021, familiarity of energy efficiency programs among RI customers remained strong and stable with respect to 2020 levels, per the Company’s online survey of a representative sample of National Grid customers. 66.1% of the customers surveyed between April 2021 and June 2021 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.

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 aligns marketing efforts with residential customer research, customer segmentation, propensity modeling, media habits research, and behavior data. Due to COVID-19 pandemic, recent campaigns reflect the 2020 changes made to energy efficiency strategies and programs to engage customers during this time. The Company’s ecommerce Marketplace at <https://ri.home.marketplace.nationalgridus.com/> serves as the online destination for customers to purchase top branded energy-efficient products. The

National Grid website remains an important resource for information on products and services as well as rebates available to customers. The Company's social media advertisements and messages on Facebook, Instagram, Twitter, Snapchat, and NextDoor ensure customers are learning about energy efficiency opportunities while they are on-line with their family, friends and neighbors.

Across marketing campaigns, messaging focuses 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. Core to our messaging is helping customers save energy and money and lower their environmental footprint. Where appropriate, messaging around safety is incorporated into marketing materials given health and safety concerns. Overall messaging tone is helpful, empathetic, and informative to ensure the information reflects the Company's role as a trusted advisor who truly cares about customers' needs.

National Grid's newest energy efficiency education campaign, which began in the fall 2020, was planned to complement all programmatic marketing efforts. The omni-channel outreach plan includes a mix of owned and paid tactics and channels. Ads are intended to be informational while providing tangible ways to take action. Core to the campaign is an interactive landing page that captures the essence of the whole-home approach and serves as the destination for customers to comprehensively understand the value of the energy efficiency programs. This interactivity allows customers to roll over the illustrated home and learn more about the various programs, potential savings and energy efficiency measures they can take, as well as link to more program details. To complement the interactive experience, a downloadable editorial style Energy Efficiency guide provides customers with seasonal and year-long energy saving tips and information about energy efficiency offers and rebates.

New for 2022:

- Using lessons learned from a 2020 demonstration campaign that was created for fridge recycling, the Company will scale its multi-cultural educational efforts through the creation of a new in-language and in-culture campaign during late 2021 and into 2022. The goal will be to increase awareness and participation of the energy efficiency programs among multicultural customers. Initially the campaign will begin with Hispanic customers and expand to other multicultural groups. Aside from this campaign, the Company will also be more consistently sending its direct mail and emails in both English and Spanish.
- The Company will expand follow-up communications for customers who receive a recommendation from the on-line home energy assessment, in-home/virtual home energy assessment and/or home energy reports to ensure customers are engaged at points when action is critical.
- The Company will use the discussion and recommendations from a new working group effort on energy efficiency program collaboration with other home visiting programs to inform future energy efficiency outreach efforts.

- A new community advocate that focuses on energy efficiency will deliver energy efficiency program information at community centers, faith-based organizations, and other community gathering places, with a particular focus on ensuring geographic diversity in EnergyWise Single Family, Multi-Family, and Income Eligible program participation.
- The Company will make available additional energy efficiency collateral for community groups that serve vulnerable populations.
- The Company's participation in the annual Rhode Island Home Show – a key residential customer event in which National Grid participates – was cancelled in 2021 due to the pandemic and will be re-evaluated for 2022.

## 11. 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                             | Air Sealing Kit - Electric         | 11      | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |
|  | Air Sealing Kit - Oil              | 26      |  |                  |              |
|  | Air Sealing Kit - Others           | 11      |  |                  |              |
|  | Pipe Insulation - Electric         | 410     |  |                  |              |
|  | Pipe Insulation - Oil              | 3,499   |  |                  |              |
|  | Pipe Insulation - Others           | 120     |  |                  |              |
|  | Pre-Wx                             | 629     |  |                  |              |
|  | Wx - OIL                           | 1,778   |  |                  |              |
|  | Wx Elec - Elec Heat only           | 219     |  |                  |              |
|  | AERATOR - Electric                 | 200     |  |                  |              |
|  | AERATOR - Oil                      | 300     |  |                  |              |
|  | AERATOR - Others                   | 11      |  |                  |              |
|  | Showerhead - Electric              | 350     |  |                  |              |
|  | Showerhead - Oil                   | 550     |  |                  |              |
|  | Showerhead - Others                | 18      |  |                  |              |
|  | Programmable thermostat - Electric | 500     |  |                  |              |
|  | Programmable thermostat - Oil      | 2,500   |  |                  |              |
|  | Programmable thermostat - Other    | 110     |  |                  |              |
|  | Wifi thermostat - Electric         | 12      |  |                  |              |
|  | Wifi thermostat - Oil              | 140     |  |                  |              |
|  | Wifi thermostat - Others           | 59      |  |                  |              |
|  | LED Bulbs                          | 57,600  |  |                  |              |
|  | LED Bulbs (EISA Exempt)            | 38,400  |  |                  |              |
|  | LED Bulbs Reflectors               |         |  |                  |              |
|  | LED Indoor Fixture                 |         |  |                  |              |
|  | LED Outdoor Fixture                |         |  |                  |              |
|  | Smart Strip                        | 12,724  |  |                  |              |
| Refrigerator Brush                     | 10,499                             |         |  |                  |              |
| Participant                            | 12,000                             | \$1,087 | \$13,039,616   |                  |              |
| HEAT Loans                             |                                    |         | \$250,000  |                  |              |
| Program Planning & Administration      |                                    |         |  | \$401,840        |              |
| Marketing                              |                                    |         |  | \$373,635        |              |
| Sales, Technical Assistance & Training |                                    |         |  | \$1,418,528      |              |
| Evaluation & Market Research           |                                    |         |  | \$281,965        |              |

| Electric Programs                      |                          |       |  |                  |              |
|--|--------------------------|-------|--|------------------|--------------|
| Program                                | Measure                  | Units | Incentive / Unit   | Total Incentives | Shared Costs |
| Multifamily                            | Custom                   | 32    | 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          | 200   |  |                  |              |
|  | SHOWERHEAD Oil           | 10    |  |                  |              |
|  | TSV Showerhead Elec      | 65    |  |                  |              |
|  | TSV Showerhead Oil       | 10    |  |                  |              |
|  | THERMOSTAT Elec with AC  | 600   |  |                  |              |
|  | THERMOSTAT OIL           | 20    |  |                  |              |
|  | Common Ext LED Bulbs     | 209   |  |                  |              |
|  | Common Ext LED Fixture   | 92    |  |                  |              |
|  | Common Ext Reflector     | 18    |  |                  |              |
|  | Common Int EISA Exempt   | 8     |  |                  |              |
|  | Common Int LED Bulbs     | 350   |  |                  |              |
|  | Common Int LED Fixture   | 301   |  |                  |              |
|  | Common Int Reflector     | 15    |  |                  |              |
|  | Dwelling Ext LED Fixture | 18    |  |                  |              |
|  | Dwelling Ext Reflector   | 16    |  |                  |              |
|  | Dwelling Int EISA Exempt | 241   |  |                  |              |
|  | Dwelling Int LED Bulbs   | 1,000 |  |                  |              |
|  | Dwelling Int Reflector   | 700   |  |                  |              |
|  | Smart Strip              | 1,000 |  |                  |              |
|  | Refrig rebate            |       |  |                  |              |
|  | Vending Miser            |       |  |                  |              |
|  | Participant              | 3600  |  |                  |              |
| HEAT Loans                             |                          |       | \$50,000   |                  |              |
| Program Planning & Administration      |                          |       |  | \$100,524        |              |
| Marketing                              |                          |       |  | \$74,350         |              |
| Sales, Technical Assistance & Training |                          |       |  | \$441,605        |              |
| Evaluation & Market Research           |                          |       |  | \$40,399         |              |



| Electric Programs   |                                   |         |  |                  |              |
|---|-----------------------------------|---------|--|------------------|--------------|
| Program   | Measure                           | Units   | Incentive / Unit   | Total Incentives | Shared Costs |
| Residential New Construction  | Adaptive Reuse                    | 132     | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |
|   | CODES AND STANDARDS               | 1       |  |                  |              |
|   | Renovation Rehab CP               | 15      |  |                  |              |
|   | Renovation Rehab Tier 1 Home      | 25      |  |                  |              |
|   | Renovation Rehab Tier 2 Home      | 10      |  |                  |              |
|   | Renovation Rehab Tier 3 Home      | 2       |  |                  |              |
|   | Tier 4 Home                       | 10      |  |                  |              |
|   | CWASHER                           | 120     |  |                  |              |
|   | DISHWASH                          | 522     |  |                  |              |
|   | SHOWERHEAD                        | 25      |  |                  |              |
|   | LED Bulbs                         | 8,833   |  |                  |              |
|   | Refrig rebate                     | 602     |  |                  |              |
|   | CP Home - Heating                 | 10      |  |                  |              |
|   | CP Home - Cooling                 | 10      |  |                  |              |
|   | CP Home - Water Heating           | 10      |  |                  |              |
|   | Tier 1 Home - Heating             | 100     |  |                  |              |
|   | Tier 1 Home - Cooling             | 100     |  |                  |              |
|   | Tier 1 Home - Water Heating       | 100     |  |                  |              |
|   | Tier 2 Home - Heating             | 80      |  |                  |              |
|   | Tier 2 Home - Cooling             | 80      |  |                  |              |
|   | Tier 2 Home - Water Heating       | 80      |  |                  |              |
|   | Tier 3 Home - Heating             | 75      |  |                  |              |
|   | Tier 3 Home - Cooling             | 75      |  |                  |              |
|   | Tier 3 Home - Water Heating       | 75      |  |                  |              |
| Participants  | 462                               | \$1,734 | \$800,884  |                  |              |
| Program Planning & Administration   |                                   |         |  | \$91,607         |              |
| Marketing   |                                   |         |  | \$23,608         |              |
| Sales, Technical Assistance & Training  |                                   |         |  | \$545,538        |              |
| Evaluation & Market Research  |                                   |         |  | \$79,905         |              |
| Residential High-Efficiency Heating, Cooling, and Hot Water (ENERGY STAR® HVAC) | ACQIVES                           | 18      | \$175  | \$3,176          |              |
|   | ACS16SEER13EER                    | 200     | \$50   | \$9,983          |              |
|   | Central Heat Pump                 | 32      | \$350  | \$11,088         |              |
|   | DOWNSIZE                          | 53      | \$250  | \$13,310         |              |
|   | ECM Pumps                         | 5,500   | \$100  | \$550,000        |              |
|   | Elec Res to MSHP                  | 425     | \$4,000  | \$1,700,000      |              |
|   | HP Mini-split QIV                 | 587     | \$175  | \$102,699        |              |
|   | HPQIVES                           | 31      | \$175  | \$5,506          |              |
|   | HPTUNE                            | 13      | \$175  | \$2,329          |              |
|   | HPWH < 55 gallon UEF 2.7          | 500     | \$600  | \$300,000        |              |
|   | HPWH >=55 gallon UEF 2.0          | 13      | \$150  | \$1,997          |              |
|   | Mini-Split Heat Pump              | 1,386   | \$350  | \$485,100        |              |
|   | WiFi Tstat-cool only,Elec         | 1,700   | \$75   | \$127,500        |              |
|   | WiFi Tstat-heat and cool,Gas      | 160     | \$75   | \$11,979         |              |
|   | HVAC Financing                    |         |  | \$410,000        |              |
|   | Program Planning & Administration |         |  |                  | \$95,734     |
|   | Marketing                         |         |  |                  | \$279,624    |
| Sales, Technical Assistance & Training  |                                   |         |  | \$524,569        |              |
| Evaluation & Market Research  |                                   |         |  | \$262,259        |              |

| Electric Programs                                     |   |         |                  |                  |              |
|---|---|---------|------------------|------------------|--------------|
| Program   | Measure   | Units   | Incentive / Unit | Total Incentives | Shared Costs |
| Residential Consumer Products (ENERGY STAR® Products) | Energy Star ProductsThermostatic Shutoff Valve, Elec      | 21      | \$11             | \$231            |              |
|   | 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 | 92      | \$15             | \$1,380          |              |
|   | Energy Star ProductsLowFlow Showerhead with TSV, Other    | 26      | \$15             | \$390            |              |
|   | Energy Star ProductsRoom Air Conditioner 10.8             | 840     | \$40             | \$33,600         |              |
|   | ES Storm Windows  | 110     | \$25             | \$2,750          |              |
|   | ES Storm Windows Elec heating                             | 110     | \$25             | \$2,750          |              |
|   | ES Storm Windows Others                                   | 110     | \$25             | \$2,750          |              |
|   | Energy Star ProductsDehumidifier Rebate                   | 2,500   | \$30             | \$75,000         |              |
|   | Energy Star ProductsDehumidifier Recycling                | 473     | \$30             | \$14,190         |              |
|   | Energy Star ProductsEnergy Star Dryer                     | 998     | \$50             | \$49,900         |              |
|   | Energy Star ProductsPool Pump variable                    | 525     | \$500            | \$262,500        |              |
|   | Energy Star ProductsRoom Air Cleaners                     | 415     | \$40             | \$16,600         |              |
|   | Energy Star ProductsSmart Strip                           | 11,813  | \$10             | \$118,130        |              |
|   | Energy Star ProductsTier 2 APS                            | 9,188   | \$35             | \$321,580        |              |
|   | Energy Star ProductsTier 2 APS OS                         | 7,875   | \$35             | \$275,625        |              |
|   | Energy Star ProductsFreezer Recycling                     | 341     | \$95             | \$32,395         |              |
|   | Energy Star ProductsREFRIG RECYCLING                      | 4,400   | \$95             | \$418,000        |              |
|   | Program Planning & Administration                         | -       |                  |                  | \$83,524     |
| Marketing   | -   |         |                  | \$464,319        |              |
| Sales, Technical Assistance & Training                | -   |         |                  | \$542,421        |              |
| Evaluation & Market Research                          | -   |         |                  | \$22,199         |              |
| 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                         | -       |                  |                  | \$55,934     |
|   | Marketing   | -       |                  |                  | \$13,099     |
|   | Sales, Technical Assistance & Training                    | -       |                  |                  | \$2,551,470  |
| Evaluation & Market Research                          | -   |         |                  | \$20,793         |              |

| Electric Programs                |  |        |                  |                  |              |
|----------------------------------|--|--------|------------------|------------------|--------------|
| Program                          | Measure                                      | Units  | Incentive / Unit | Total Incentives | Shared Costs |
| Income Eligible<br>Single Family | AMPEDUC TLC                                  | 3,583  | \$180            | \$644,906        |              |
|                                  | AMPWx DelFuel                                | 573    | \$5,000          | \$2,865,000      |              |
|                                  | AMPWx Elec                                   | 36     | \$5,000          | \$180,000        |              |
|                                  | AMPDHWELEC                                   | 72     | \$20             | \$1,433          |              |
|                                  | AMPDHWGAS                                    | 72     | \$20             | \$1,433          |              |
|                                  | AMPDHWOIL                                    | 72     | \$20             | \$1,433          |              |
|                                  | AMPWATERBED                                  | 1      | \$650            | \$650            |              |
|                                  | Early Retirement CW Elec DHW & Elec Dryer    | 107    | \$700            | \$74,900         |              |
|                                  | Early Retirement CW Elec DHW & Gas Dryer     | 341    | \$700            | \$238,700        |              |
|                                  | AMPACREPLACE                                 | 1,875  | \$350            | \$656,250        |              |
|                                  | AMPHEATSYSTEM                                | 430    | \$5,000          | \$2,149,686      |              |
|                                  | AMPMinisplit Heat Pumps Electric Resistance  | 48     | \$15,000         | \$720,000        |              |
|                                  | 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                                 | 46,577 | \$9              | \$395,901        |              |
|                                  | AMPAPREMOV                                   | 7      | \$51             | \$357            |              |
|                                  | AMPDehumidifier Rebate                       | 625    | \$250            | \$156,250        |              |
|                                  | AMPSmart Strip                               | 4,299  | \$20             | \$85,980         |              |
|                                  | Early Retirement CW Gas DHW & Elec Dryer     | 5      | \$700            | \$3,500          |              |
|                                  | Early Retirement CW Gas DHW & Gas Dryer      | 229    | \$700            | \$160,300        |              |
|                                  | Early Retirement CW Oil DHW & Elec Dryer     | 135    | \$700            | \$94,500         |              |
|                                  | Early Retirement CW Propane DHW & Elec Dryer | 9      | \$700            | \$6,300          |              |
|                                  | AMPFREEZER                                   | 247    | \$550            | \$135,850        |              |
|                                  | AMPRefrig rebate                             | 1,866  | \$1,050          | \$1,959,300      |              |
|                                  | Program Planning & Administration            |        |                  |                  | \$335,951    |
|                                  | Marketing                                    | -      |                  |                  | \$135,023    |
|                                  | Sales, Technical Assistance & Training       | -      |                  |                  | \$1,965,905  |
|                                  | Evaluation & Market Research                 | -      |                  |                  | \$72,493     |

| Electric Programs                      |  |       |  |                  |              |       |             |           |
|--|--|-------|--|------------------|--------------|-------|-------------|-----------|
| Program                                | Measure                                | Units | Incentive / Unit   | Total Incentives | Shared Costs |       |             |           |
| Income Eligible Multifamily Retrofit   | Participant (NEB)                      | 3,600 | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |       |             |           |
|  | Custom                                 | 45    |  |                  |              |       |             |           |
|  | 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                   | 50    |  |                  |              |       |             |           |
|  | Common Ext LED Fixture                 | 50    |  |                  |              |       |             |           |
|  | Common Ext Reflector                   | 3     |  |                  |              |       |             |           |
|  | Common Int LED Bulbs                   | 50    |  |                  |              |       |             |           |
|  | Common Int LED Fixture                 | 700   |  |                  |              |       |             |           |
|  | Common Int Reflector                   | 7     |  |                  |              |       |             |           |
|  | Dwelling Ext Reflector                 | 7     |  |                  |              |       |             |           |
|  | Dwelling Int EISA Exempt               | 17    |  |                  |              |       |             |           |
|  | Dwelling Int LED Bulbs                 | 100   |  |                  |              |       |             |           |
|  | Dwelling Int Reflector                 | 7     |  |                  |              |       |             |           |
|  | Smart Strip                            | 50    |  |                  |              |       |             |           |
|  | Refrig rebate                          |       |  |                  |              |       |             |           |
|  | Vending Miser                          |       |  |                  |              |       |             |           |
|  | Participants                           | 3,600 |  |                  |              | \$840 | \$3,024,000 |           |
|  | Program Planning & Administration      | -     |  |                  |              |       |             | \$113,818 |
| Marketing                              | -                                      |       |  | \$14,147         |              |       |             |           |
| Sales, Technical Assistance & Training | -                                      |       |  | \$344,088        |              |       |             |           |
| Evaluation & Market Research           | -                                      |       |  | \$39,770         |              |       |             |           |
| Residential ConnectedSolutions         | Thermostats New                        | 2,692 | \$45   | \$121,140        |              |       |             |           |
|  | Thermostats Existing                   | 6,409 | \$20   | \$128,180        |              |       |             |           |
|  | Pool Pumps                             | 25    | \$120  | \$3,000          |              |       |             |           |
|  | Program Planning & Administration      |       |  |                  | \$37,984     |       |             |           |
|  | Marketing                              |       |  |                  | \$11,343     |       |             |           |
|  | Sales, Technical Assistance & Training |       |  |                  | \$368,386    |       |             |           |
|  | Evaluation & Market Research           |       |  |                  | \$37,395     |       |             |           |

Table 4. Natural Gas Programs

| Gas Programs                           |  |       |  |                  |              |           |
|--|--|-------|--|------------------|--------------|-----------|
| Program                                | Measure  | Units | Incentive / Unit   | Total Incentives | Shared Costs |           |
| EnergyStar®<br>HVAC                    | BOILER RESET   | 10    | \$225  | \$2,250          |              |           |
|  | Boiler90   | 0     | \$450  | \$0              |              |           |
|  | Boiler95   | 460   | \$1,000  | \$460,000        |              |           |
|  | COMBO CONDENSING                                     | 0     | \$600  | \$0              |              |           |
|  | COMBO CONDENSING 95                                  | 1350  | \$1,200  | \$1,620,000      |              |           |
|  | ENERGY STAR COND WATER HEATER 0.80 UEF               | 5     | \$250  | \$1,250          |              |           |
|  | Furnace95ECM   | 340   | \$500  | \$170,000        |              |           |
|  | Furnace97ECM   | 120   | \$800  | \$96,000         |              |           |
|  | HEAT RECOVERY VENT                                   | 10    | \$500  | \$5,000          |              |           |
|  | ENERGY STAR STORAGE WATER HEATER .64 UEF (med draw)  | 45    | \$100  | \$4,500          |              |           |
|  | ENERGY STAR STORAGE WATER HEATER .68 UEF (high draw) | 50    | \$100  | \$5,000          |              |           |
|  | ENERGY STAR ON DEMAND WATER HEATER 0.87 UEF          | 300   | \$600  | \$180,000        |              |           |
|  | LOW_FLOW_SHOWERHEAD                                  | 325   | \$7  | \$2,113          |              |           |
|  | TSV  | 16    | \$12   | \$184            |              |           |
|  | TSV_SHOWERHEAD                                       | 120   | \$15   | \$1,800          |              |           |
|  | WiFi Thermostat cooling and htg                      | 160   | \$75   | \$12,000         |              |           |
|  | WiFi Thermostat gas ht only                          | 1800  | \$75   | \$135,000        |              |           |
|  | Programmable Thermostat                              | 200   | \$25   | \$5,000          |              |           |
|  | Combo Furnace  | 20    | \$700  | \$14,000         |              |           |
|  | Water Heater, Indirect, Gas                          | 187   | \$400  | \$74,800         |              |           |
|  | Program Planning & Administration                    |       |  |                  |              | \$113,611 |
|  | Marketing  |       |  |                  |              | \$206,854 |
| Sales, Technical Assistance & Training |  |       |  |                  | \$238,675    |           |
| Evaluation & Market Research           |  |       |  |                  | \$114,427    |           |
| EnergyWise                             | Aerator  | 500   | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |           |
|  | Weatherization                                       | 2024  |  |                  |              |           |
|  | Air Sealing Kit (Gas)                                | 594   |  |                  |              |           |
|  | Showerhead   | 500   |  |                  |              |           |
|  | Pipe Wrap  | 5123  |  |                  |              |           |
|  | THERMOSTAT   | 1550  |  |                  |              |           |
|  | WiFi THERMOSTAT                                      | 261   |  |                  |              |           |
|  | Participants   | 1,761 | \$3,997  | \$7,037,705      |              |           |
|  | Program Planning & Administration                    |       |  |                  | \$199,942    |           |
|  | Marketing  |       |  |                  | \$71,069     |           |
| Sales, Technical Assistance & Training |  |       |  | \$1,173,301      |              |           |
| Evaluation & Market Research           |  |       |  | \$163,914        |              |           |

| Gas Programs                 |  |         |  |                  |              |
|------------------------------|--|---------|--|------------------|--------------|
| Program                      | Measure                                | Units   | Incentive / Unit   | Total Incentives | Shared Costs |
| Multifamily                  | Air Sealing_MF                         | 3900    | 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                      | 500     |  |                  |              |
|                              | INSULATION_MF                          | 3600    |  |                  |              |
|                              | Pipe Wrap (Water Heating)_MF           | 882     |  |                  |              |
|                              | Programmable Thermostat_MF             | 500     |  |                  |              |
|                              | TSV Showerhead_MF                      | 200     |  |                  |              |
|                              | WiFi thermostat gas_MF                 | 200     |  |                  |              |
|                              | Participant_MF                         | 4000    |  |                  |              |
|                              | Program Planning & Administration      |         | \$304  | \$1,216,000      | \$47,531     |
|                              | Marketing                              |         |  |                  | \$69,759     |
|                              | Sales, Technical Assistance & Training |         |  |                  | \$153,561    |
| Evaluation & Market Research |  |         |  | \$15,140         |              |
| Home Energy Reports          | New movers dual fuel                   | 10342   | \$0  | \$0              |              |
|                              | Optout dual fuel                       | 123401  | \$0  | \$0              |              |
|                              | Optout gas only                        | 18581   | \$0  | \$0              |              |
|                              | Refill                                 |         |  |                  | \$9,647      |
|                              | Program Planning & Administration      |         |  |                  | \$20         |
|                              | Marketing                              |         |  |                  | \$429,118    |
|                              | Sales, Technical Assistance & Training |         |  |                  | \$3,169      |
| Residential New Construction | CODES AND STANDARDS                    | 1       | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |
|                              | CP                                     | 15      |  |                  |              |
|                              | CPDHW                                  | 15      |  |                  |              |
|                              | RR CP                                  | 9       |  |                  |              |
|                              | RR CPDHW                               | 9       |  |                  |              |
|                              | RR Tier 1                              | 10      |  |                  |              |
|                              | RR Tier 1 DHW                          | 10      |  |                  |              |
|                              | RR Tier 2                              | 10      |  |                  |              |
|                              | RR Tier 2 DHW                          | 10      |  |                  |              |
|                              | RR Tier 3                              | 2       |  |                  |              |
|                              | RR Tier 3 DHW                          | 2       |  |                  |              |
|                              | RR Tier 4                              | 0       |  |                  |              |
|                              | RR Tier 4 DHW                          | 0       |  |                  |              |
|                              | SHOWERHEAD                             | 21      |  |                  |              |
|                              | Tier 1                                 | 46      |  |                  |              |
|                              | Tier 1 DHW                             | 46      |  |                  |              |
|                              | Tier 2                                 | 98      |  |                  |              |
|                              | Tier 2 DHW                             | 98      |  |                  |              |
|                              | Tier 3                                 | 15      |  |                  |              |
|                              | Tier 3 DHW                             | 15      |  |                  |              |
|                              | Tier 4                                 | 0       |  |                  |              |
|                              | Tier 4 DHW                             | 0       |  |                  |              |
|                              | Adaptive Reuse                         | 83      |  |                  |              |
| Participants                 | 289                                    | \$1,148 | \$332,161  |                  |              |

|  |  |  |  |  |           |
|--|--|--|--|--|-----------|
|  | Program Planning & Administration      |  |  |  | \$34,468  |
|  | Marketing                              |  |  |  | \$2,196   |
|  | Sales, Technical Assistance & Training |  |  |  | \$134,989 |
|  | Evaluation & Market Research           |  |  |  | \$88,836  |

| Gas Programs                  |  |       |  |                  |              |
|-------------------------------|--|-------|--|------------------|--------------|
| Program                       | Measure                                | Units | Incentive / Unit   | Total Incentives | Shared Costs |
| Income Eligible Single Family | HEATSYSTEM                             | 280   | \$5,000  | \$1,400,000      |              |
|                               | WEATHER                                | 704   | \$5,000  | \$3,520,300      |              |
|                               | Participants                           | 818   | \$6,131  | \$5,016,386      |              |
|                               | Program Planning & Administration      |       |  |                  | \$131,061    |
|                               | Marketing                              |       |  |                  | \$25,934     |
|                               | Sales, Technical Assistance & Training |       |  |                  | \$1,165,624  |
|                               | Evaluation & Market Research           |       |  |                  | \$28,121     |
| Income Eligible Multifamily   | Air Sealing_LI                         | 420   | Average Incentive based on measure mix and is applied per participant (see line below) |                  |              |
|                               | BOILER Commercial_LI                   | 65    |  |                  |              |
|                               | BOILER_LI                              | 30    |  |                  |              |
|                               | CUST NONLGT_LI                         | 9     |  |                  |              |
|                               | Faucet Aerator_LI                      | 900   |  |                  |              |
|                               | Insulatioin_LI                         | 1000  |  |                  |              |
|                               | Pipe Wrap (Water Heating)_LI           | 500   |  |                  |              |
|                               | Programmable Thermostat_LI             | 300   |  |                  |              |
|                               | TSV Showerhead_LI                      | 200   |  |                  |              |
|                               | Participant (NEB)_LI                   | 3150  |  |                  |              |
|                               | Program Planning & Administration      |       | \$786  | \$2,474,500      | \$70,834     |
|                               | Marketing                              |       |  |                  | \$10,877     |
|                               | Sales, Technical Assistance & Training |       |  |                  | \$362,626    |
| Evaluation & Market Research  |  |       |  | \$29,979         |              |





# 2022 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 2022**

While the Company anticipates that lighting will continue to constitute the largest single source of savings in the C&I programs, its efforts are focused on driving non-lighting opportunities and program enhancements that encourage deeper, more comprehensive measure adoption in every customer class. These efforts will increase savings from HVAC and other non-lighting measures in 2022 compared to recent years and serve as building blocks that will transform the portfolio in the coming years. In 2022, the Company will:

- Implement recommendations from a 2021 study of market barriers and opportunities, which further explores measures highlighted in the 2020 Market Potential Study.
- Scale up Small Business weatherization.
- Streamline the retro-commissioning process.
- Fund monitoring-based commissioning set-up costs.
- Increase Active Demand Response (ADR) targets by 23% above 2021 estimates.

- Expand the focus on non-lighting measures and ADR within existing vendor-driven initiatives.
- Conduct targeted training activities for program delivery workforce on specific non-lighting measures.
- Investigate several promising new measure offerings, including enhanced rooftop unit (RTU) controls and grocery refrigeration leak detection repairs.

In some cases, these are long-term investments where it may take years to realize the full benefits. For example, a more highly trained workforce can complete better system installations for years. Likewise, MBCx systems can drive significant savings over time, but it can take a year or more to yield results. Similarly, the Whole Building approach, which was revamped in 2021, seeks to influence the design of buildings that take several years to complete.

The specific priority measures reflect a wide variety of non-lighting measures, particularly encouraging adoption and improved operation of heating, cooling, and ventilation (HVAC) technologies. The innovations and enhancements also reflect many ideas and insights that have evolved from the close collaboration with the Energy Efficiency & Resource Management Council (EERMC) and its consulting team, the Office of Energy Resources (OER), and the Division of Public Utilities and Carriers (the Division), as well as our vendors, customers, and trade allies.

The Company is continuing its focus on specific market segments to engage customers with tailored approaches to generate more comprehensive measure adoption (Telecommunications initiative launched in 2021), enhancements that make participation easier (such as the Equipment and Systems Performance Optimization), provide attractive incentives for specific customer classes (especially Small Business), and enhancements that reduce barriers to comprehensive measure adoption (e.g., Whole Building Streamlined pathway in New Construction).

Equity is another major focus in this plan, in alignment with the objective in the Least Cost Procurement (LCP) that program design shall “ensure that all customers have equitable opportunities to participate in the offerings of EE Plans.” To that end, the Company will continue to offer robust opportunities to small businesses customers. New C&I activities include targeting of woman and minority-owned enterprises, hiring multilingual small business auditors, conducting participant surveys in multiple languages, and promoting equitable hiring practices through vendor agreements. The Company is continuing to monitor the Equity Working Group and will implement recommendations as appropriate and prudent within the C&I portfolio.

The Company has also collaborated with stakeholders to address workforce development issues in alignment with the LCP standard, which states, “The distribution company shall include wherever possible and practical partnerships with existing educational and job training entities.”

To meet these objectives, the Company plans to ensure contractors and engineers participating in the programs receive proper design and installation training from manufacturers or others and encourage achievement of advanced certifications to further enhance expertise. To complement this effort, the Company will sponsor targeted training sessions to upskill the existing workforce in supporting high-performance buildings with advanced technologies, including trainings on advanced controls for HVAC and lighting. These efforts are described under Cross-Cutting Programs.

Finally, this plan will be implemented in an environment of rapidly rising inflation, potentially driven by government stimulus, workforce shortages, and supply chain disruptions. According to the U.S. Bureau of Labor Statistics’ most recent Producer Price Index (PPI) report (July 2021), nationwide prices of finished goods have risen 7.8% over the past year, “the largest advance since 12-month data were first calculated in November 2010.”<sup>1</sup> Both lighting and HVAC distributors have reported significant price increases. Inflation is a headwind that will reduce the portion of customer project costs covered by program incentives and lengthens payback periods.

**Commercial & Industrial Programs**

There are five C&I energy efficiency programs.

*Table 1. Commercial and Industrial Programs*

|   |
|---|
| <b>Large Commercial and Industrial New Construction</b> |
| <b>Large Commercial Retrofit</b>                        |
| <b>Small Business Direct Install</b>                    |
| <b>Connected Solutions (Active Demand Response)</b>     |
| <b>C&amp;I Multifamily Program</b>                      |

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 that 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

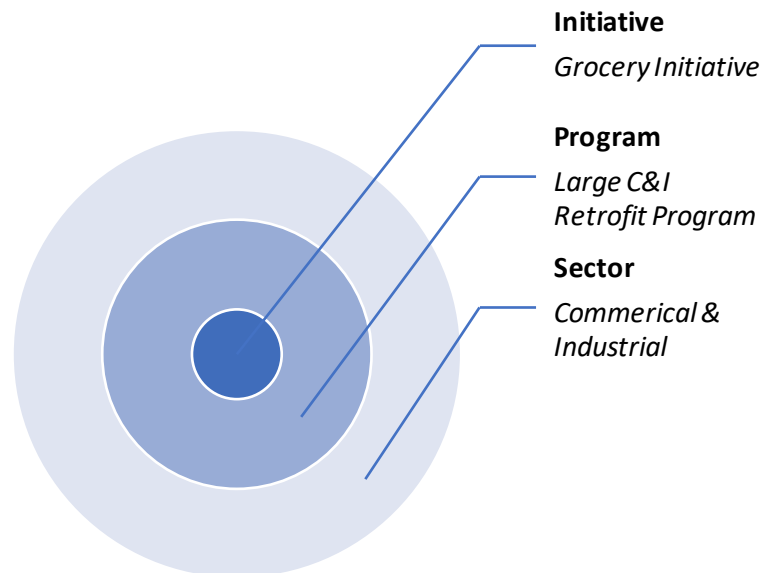
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<sup>1</sup> U.S. Bureau of Labor Statistics. (2021, August). PRODUCER PRICE INDEXES – JULY 2021. U.S. Department of Labor. <https://www.bls.gov/news.release/pdf/ppi.pdf>

subset of measures or services within that program and/or targets a certain segment of customers. Examples include the Grocery Initiative and Industrial Initiatives, primarily within the Large Commercial and Industrial Retrofit Program (though some savings and incentive spend within these programs are captured in the New Construction Program). Anticipated savings, budgets, and participants for each initiative are included in the program-level totals.

All initiatives support both electric and gas measures, unless otherwise noted or self-evident (e.g., lighting initiatives only cover electric measures).

*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 2022, 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 at the end of this Attachment. The Company will continue to engage in pilots, demonstrations, and assessments; please refer to Attachment 8 for a detailed scope and list for each pilot, demonstration, and assessment proposed for the 2022 Energy Efficiency Plan.

**Program Description Structure**

In order to streamline PUC, stakeholder, and reader access to the most pertinent program information in the 2022 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 2022              | 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. Industry-focused 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, initiative-level tables do not include “Proposed Upcoming Evaluations” sections. All evaluation studies are described in Attachment 3: 2022 Evaluation, Measurement, and Verification. |
| 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  |
| 2022 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 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane <sup>2</sup> ) | Budget (\$000) | Participation <sup>3</sup> |
|----------|-------------------------|-----------------------|---|---|----------------|----------------------------|
| Electric |                         |                       |   |   |                |                            |

**Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas |                      |                    |                |               |

<sup>2</sup> For a breakdown of program level energy savings goals see Attachment 5, table E6-A and Attachment 6, table G6-A for more details.

<sup>3</sup> For information on the metric used to measure participation by program, please reference the main text, section 2.6



The below figures compare the distribution of the C&I 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.

Figure 2. 2022 Planned Distribution of Lifetime MWh Goals for C&I Electric Sector

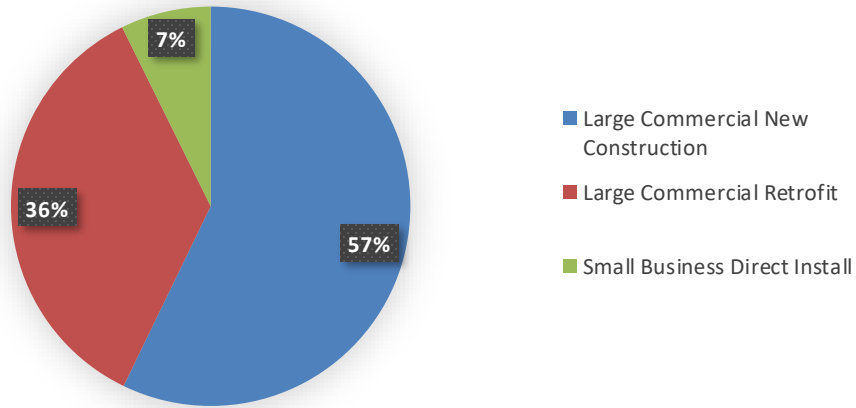


Figure 3. 2022 Planned Distribution of Annual MWh Goals for C&I Electric Sector

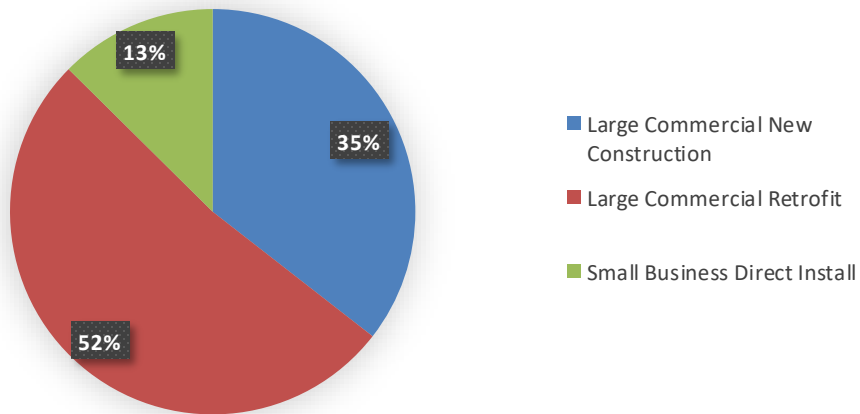


Figure 4. 2022 Planned Distribution of Lifetime MMBtu Goals for C&I Gas Sector

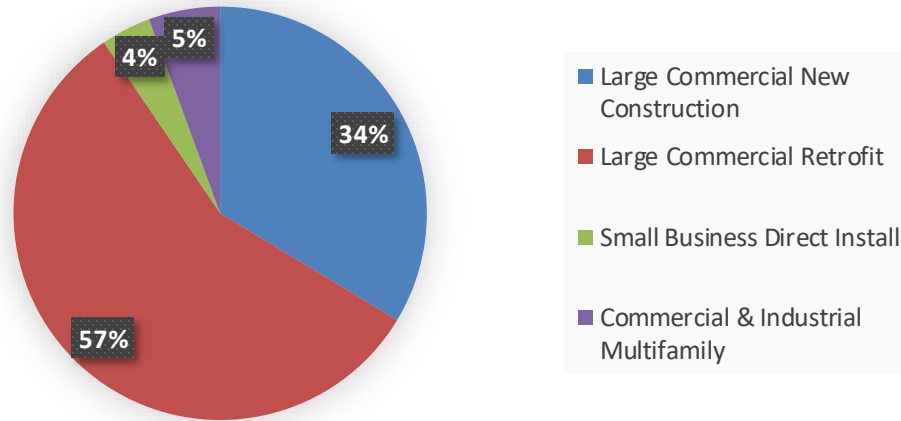
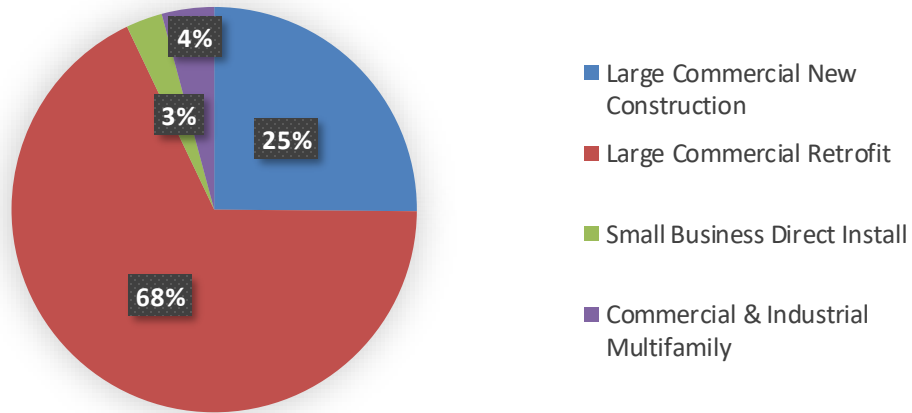


Figure 5. 2022 Planned Distribution of Annual MMBtu Goals for C&I Gas Sector



## 2. Large Commercial and Industrial New Construction Program

|                      |   |
|----------------------|---|
| Eligibility Criteria | <p>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.</p> <p><b>New Buildings, Additions, Major Renovations and Tenant Fit-Ups</b><br/> 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.</p> <p><b>End-of-Life Replacements</b><br/> 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. Baseline energy use is considered to be the energy code or industry standard practice where applicable. Savings are calculated using the baseline. 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.</p> |
| Offerings            | <p><b>New Buildings, Additions, Major Renovations and Tenant Fit-Ups</b><br/> 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.</p> <p>The Large Commercial and Industrial New Construction Program offers four pathways for ground up new construction or major renovation projects which were introduced in 2021.</p> <ul style="list-style-type: none"> <li>• <b>Path 1: Zero Net Energy Ready</b></li> </ul>  |

|  |  |                               |                         |                         |  |   |                         |                                   |                                      |                               |                         |   |                            |
|--|--|-------------------------------|-------------------------|-------------------------|--|---|-------------------------|-----------------------------------|--------------------------------------|-------------------------------|-------------------------|---|----------------------------|
|  | <ul style="list-style-type: none"> <li>• <b>Path 2: Whole Building Energy Use Intensity Reduction</b><br/> 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.</li> <li>• <b>Path 3: The Whole Building Streamlined</b></li> <li>• <b>Path 4: Systems Approach</b><br/> These pathways support projects that are in the design development stage and incorporate energy efficient equipment and energy conservation measures (ECMs).</li> </ul> <p><i>Table 2. Requirements and Eligibility for Large Commercial and Industrial New Construction Pathways</i></p> <table border="1"> <tr> <td><b>Zero Net Energy Ready</b></td> <td>Achieve 25 EUI or lower</td> <td>Over 20,000 Square Feet</td> </tr> <tr> <td><b>Whole Building Energy Use Intensity</b></td> <td>Achieve 10% better than RI Baseline EUI</td> <td>Over 50,000 Square Feet</td> </tr> <tr> <td><b>Whole Building Streamlined</b></td> <td>Custom and Prescriptive ECM measures</td> <td>20,000 to 100,000 Square Feet</td> </tr> <tr> <td><b>Systems Approach</b></td> <td>Prescriptive rebates for installing energy efficient equipment and measures</td> <td>No Square Foot requirement</td> </tr> </table> <p><b>Zero Net Energy Ready:</b> 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.</p> <p><b>Whole Building Energy Use Intensity Reduction:</b> 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</p> | <b>Zero Net Energy Ready</b>  | Achieve 25 EUI or lower | Over 20,000 Square Feet | <b>Whole Building Energy Use Intensity</b> | Achieve 10% better than RI Baseline EUI | Over 50,000 Square Feet | <b>Whole Building Streamlined</b> | Custom and Prescriptive ECM measures | 20,000 to 100,000 Square Feet | <b>Systems Approach</b> | Prescriptive rebates for installing energy efficient equipment and measures | No Square Foot requirement |
| <b>Zero Net Energy Ready</b>               | Achieve 25 EUI or lower  | Over 20,000 Square Feet       |                         |                         |  |   |                         |                                   |                                      |                               |                         |   |                            |
| <b>Whole Building Energy Use Intensity</b> | Achieve 10% better than RI Baseline EUI  | Over 50,000 Square Feet       |                         |                         |  |   |                         |                                   |                                      |                               |                         |   |                            |
| <b>Whole Building Streamlined</b>          | Custom and Prescriptive ECM measures   | 20,000 to 100,000 Square Feet |                         |                         |  |   |                         |                                   |                                      |                               |                         |   |                            |
| <b>Systems Approach</b>                    | Prescriptive rebates for installing energy efficient equipment and measures  | No Square Foot requirement    |                         |                         |  |   |                         |                                   |                                      |                               |                         |   |                            |

|                             |  |
|-----------------------------|--|
|                             | <p>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 2022 will be based on the current RI building code.</p> <p><b>Whole Building Streamlined:</b> 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.</p> <p><b>Systems Approach:</b> 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). This program will continue to align with the state’s Commercial Stretch Code, including providing incentives and technical support to projects pursuing this goal.</p> |
| Implementation and Delivery | <p><b>Zero Net Energy Ready:</b></p> <p>The Company’s implementation team, which includes vendor support, 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</p>  |

|  |   |
|--|---|
|  | <p>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.</p> <p><b>Whole Building Energy Use Intensity Reduction:</b> The National Grid Energy Efficiency implementation 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 charrette 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</p> |
|--|---|

|                   |   |
|-------------------|---|
|                   | <p>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 the first year of occupancy to help achieve the EUI. Verification documents must be submitted to obtain the optional verification incentive.</p> <p><b>Whole Building Streamlined:</b><br/> The National Grid implementation 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; from 20,000 to 100,000 square feet), 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.</p> <p><b>Systems Approach:</b><br/> The National Grid implementation 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.</p> |
| Customer Feedback | Customer feedback is gained through implementation team interactions with customers and design teams, who regularly provide insights on what types of technical assistance and design support   |

|                               |   |
|-------------------------------|---|
|                               | <p>moves the builders and architects and end customers to adopt the high efficiency measures and design.</p>  |
| Changes for 2022              | <p>The Company will leverage municipal electronic permitting information (subject to this data being easily and broadly accessible) to identify trends and better characterize the State’s C&amp;I new construction market.</p> <p>In early 2022, RI is expected to update its energy code. RI program baselines, where applicable, will be updated to reflect this updated baseline.</p>   |
| Rationale for Changes         | <p>No significant program changes are proposed since the program’s new four path structure was just introduced in 2021. More time is needed for projects to be completed within this new program structure before its effectiveness can be assessed.</p>  |
| Proposed Upcoming Evaluations | <p>There are several ongoing and new evaluations planned for 2022. The following evaluations are relevant to the Large C&amp;I New Construction Program, as well as the Large C&amp;I Retrofit Program.</p> <ul style="list-style-type: none"> <li>• RI-21-CG-CustGasPY20 Impact Evaluation of PY2020 Custom Gas Installations</li> <li>• RI-22-CG-CustGasPY21 Impact Evaluation of PY2021 Custom Gas Installations</li> <li>• RI-21-CE-CustElecPY20 Impact Evaluation of PY2020 Custom Electric Installations</li> <li>• RI-22-CE-CustElecPY21 Impact Evaluation of PY2021 Custom Electric Installations</li> <li>• RI-22-CX-FRSO C&amp;I Free-Ridership and Spillover Study</li> <li>• RI-21-CE-LightMar C&amp;I Lighting Market Characterization Study</li> <li>• RI-22-CX-Presc C&amp;I Prescriptive Non-Lighting Impact Evaluation</li> </ul> <p>The following evaluation is specific to the Large C&amp;I New Construction Program.</p> <ul style="list-style-type: none"> <li>• RI-22-CX-Codes C&amp;I New Construction and Code Compliance Study</li> </ul> |
| Notes                         |   |



**Large Commercial and Industrial New Construction – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 503,905                 | 28,167                | 1,745   | -211,904                                    | 18,387         | 96            |

**Large Commercial and Industrial New Construction – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 788,763              | 52,956             | 3,187          | 94            |

### 3. Initiatives Specific to Large Commercial and Industrial New Construction Program

#### 3.1. Performance Lighting Plus

|                             |  |
|-----------------------------|--|
| <p>Eligibility Criteria</p> | <p>Any customer with a commercial meter is eligible to participate in this initiative. All projects that qualify under this incentive must:</p> <ul style="list-style-type: none"> <li>• Be a new construction or renovation project that includes the installation of new LED light fixtures and qualifying lighting controls for commercial, industrial, educational, or municipal building(s).</li> <li>• Be a code-dependent project or extensive/substantial renovation.</li> <li>• Average a minimum of 2,000 lighting operating hours per year (before controls).</li> </ul> <p>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.</p>   |
| <p>Offerings</p>            | <p><b>Incentives</b><br/> Incentives will be offered in two tiers.</p> <p><b>Tier 1 – Performance Lighting – LED lighting with Luminaire Level Lighting Controls or Wirelessly Accessible Controls</b></p> <p>This pathway offers an incentive of \$.55 for each gross kWh saved greater than 40% below code for the building or space type and must meet the following requirements -</p> <ul style="list-style-type: none"> <li>• 80% of lighting project load must be controlled LED fixtures (DLC QPL listed or National Grid approved), with all controlled LED fixtures wirelessly accessible to initialize, configure, and commission. Individual fixture addressability and luminaire level lighting control (LLLC) as outlined by DLC is optional. The project must include and demonstrate a minimum of one control strategy per fixture and two different control strategies at the project level (e.g. occupancy, daylighting, task tuning/high end trim). If luminaires are not LLLC, National Grid will consider “room based” controls on a case by case basis.</li> </ul> |

|                                    |  |
|------------------------------------|--|
|                                    | <p><b>Tier 2 -Performance Lighting – LED Fixtures with Networked Lighting Controls System</b></p> <p>This pathway offers an incentive of \$.85 or each gross kWh saved greater than 40% below code for the building or space type and must meet the following requirements -</p> <ul style="list-style-type: none"> <li>• 80% of project load must utilize a networked lighting control system, as defined by DLC. The system must be capable of energy monitoring and demand response, as defined by DLC. The customer or their representative must also provide a control narrative for the system with a minimum of two different control strategies at the project level (e.g. occupancy, daylighting, task tuning/high end trim, and it must be fully commissioned with reporting. National Grid recommends that these systems demonstrate demand response capability.</li> </ul>   |
| <p>Implementation and Delivery</p> | <p><b>Application Forms</b></p> <ul style="list-style-type: none"> <li>• Applications for Performance Lighting Plus incentives are made available through vendors, 3<sup>rd</sup> party implementers, and Customer Solution Sales Team. However, applications can also be created and submitted online using the Rhode Island Application Portal (RIAP).</li> </ul> <p><b>Pre-Approval Requirements</b></p> <ul style="list-style-type: none"> <li>• The Customer must submit a copy of the Manufacturer’s technical specification sheets (“cut sheets”) for each type of eligible equipment to be purchased.</li> <li>• Once pre-approved, a “pre-approved incentive letter” will be issued.</li> </ul> <p><b>Installation and Incentive Requirements</b></p> <ul style="list-style-type: none"> <li>• Once pre-approved, the customer must purchase and install the qualifying equipment within twelve (12) months of National Grid’s pre-approval</li> <li>• Next, the Customer must return the following required information to National Grid within 30 days of the installation: <ul style="list-style-type: none"> <li>○ A copy of the completed and signed pre-approval application</li> </ul> </li> </ul> |

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|  | <ul style="list-style-type: none"> <li>○ 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</li> <li>○ 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</li> <li>○ At the post-installation verification, the customer must sign the post-installation customer acknowledgement section of the original application</li> </ul> <p><b>Application Process and Requirement for National Grid Approval</b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● To be eligible for performance lighting plus incentives, a customer must have an active electric account.</li> <li>● 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.</li> <li>● National Grid reserves the right to approve or disapprove of any application or proposed performance lighting plus incentive.</li> <li>● 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: <ul style="list-style-type: none"> <li>○ Completed and signed Program rebate form</li> <li>○ Original date receipts for purchase and installation of energy efficiency measures, and</li> </ul> </li> </ul> |
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|                       | <ul style="list-style-type: none"> <li>○ Any other required information or documentation within such time as Program Materials indicate.</li> </ul> <p><b>Pre- and Post-Installation Verification; Monitoring and Inspection</b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● 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.</li> </ul> |
| 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 2022      | National Grid has worked with the consultants to the EERMC to alter incentives and requirements to encourage the adoption of luminaires and systems that offer more savings and flexibility of control. In addition, the incentives are structured in such a way that should be more transparent to vendors allowing for increased throughput. The incentives and requirements are modeled on a successful offering in Connecticut.   |
| Rationale for Changes | <ul style="list-style-type: none"> <li>● Incentive transparency for customers and their advisors to increase program participation.</li> <li>● Move the market forward for luminaires and systems with additional savings and capabilities.</li> <li>● Increase the deployment of demand responsive lighting</li> </ul>   |
| Notes                 | Performance Lighting may also be utilized in Retrofit applications as well. Please see the Retrofit portion of this attachment for more details.  |

#### 4. Large Commercial Retrofit Program

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| 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                   | <p>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:</p> <ul style="list-style-type: none"> <li>• <b>Prescriptive application</b> process;</li> <li>• By working with a National Grid Sales Representative or a Project Expeditor (PEX) to complete a <b>Custom application</b> for any energy improvement that is not covered by the Prescriptive pathway; or</li> <li>• Via the <b>Upstream program</b>.</li> </ul> <p>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.</p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>• Customer Owned Streetlights</li> <li>• Company Owned Streetlights</li> <li>• Equipment &amp; System Performance Optimization</li> <li>• Combined Heat and Power (CHP)</li> <li>• Fuel Cells</li> </ul> |
| Implementation and Delivery | <b>Prescriptive Application</b>  |

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|                               | <p>Customers complete a prescriptive application through the Rhode Island Digital Application Portal (RIDAP; <a href="https://www.ridap.nationalgridus.com">https://www.ridap.nationalgridus.com</a>) for a wide variety of energy efficient products such as lighting, air compressors, or variable speed drives (VSDs).</p> <p><b>Upstream</b><br/> 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 6.5. Note that Upstream Lighting savings are captured within the Retrofit program, and Upstream HVAC and Food Service are captured within New Construction</p> <p><b>Custom Application</b><br/> 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.</p> |
| Customer Feedback             | Please see Initiatives sections for customer feedback.  |
| Changes for 2022              | Specific changes to initiatives in 2022 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 | <p>There are a number of ongoing and new evaluations planned for 2022. The following evaluations are relevant to the Large C&amp;I Retrofit Program, as well as the Large C&amp;I New Construction Program.</p> <ul style="list-style-type: none"> <li>• RI-21-CG-CustGasPY20 Impact Evaluation of PY2020 Custom Gas Installations</li> <li>• RI-22-CG-CustGasPY21 Impact Evaluation of PY2021 Custom Gas Installations</li> <li>• RI-21-CE-CustElecPY20 Impact Evaluation of PY2020 Custom Electric Installations</li> <li>• RI-22-CE-CustElecPY21 Impact Evaluation of PY2021 Custom Electric Installations</li> <li>• RI-22-CX-FRSO C&amp;I Free-Ridership and Spillover Study</li> </ul>  |

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|       | <ul style="list-style-type: none"> <li>RI-21-CE-LightMar C&amp;I Lighting Market Characterization Study</li> <li>RI-22-CX-Presc C&amp;I Prescriptive Non-Lighting Impact Evaluation</li> </ul> <p>The following evaluations are specific to the Large C&amp;I Retrofit Program.</p> <ul style="list-style-type: none"> <li>RI-22-CX-RTUOpt Automated RTU Optimization Demonstration Evaluation</li> </ul> |
| Notes |   |

**Large Commercial Retrofit – Electric Program Goals, Metrics, Budgets, Participation for 2022**

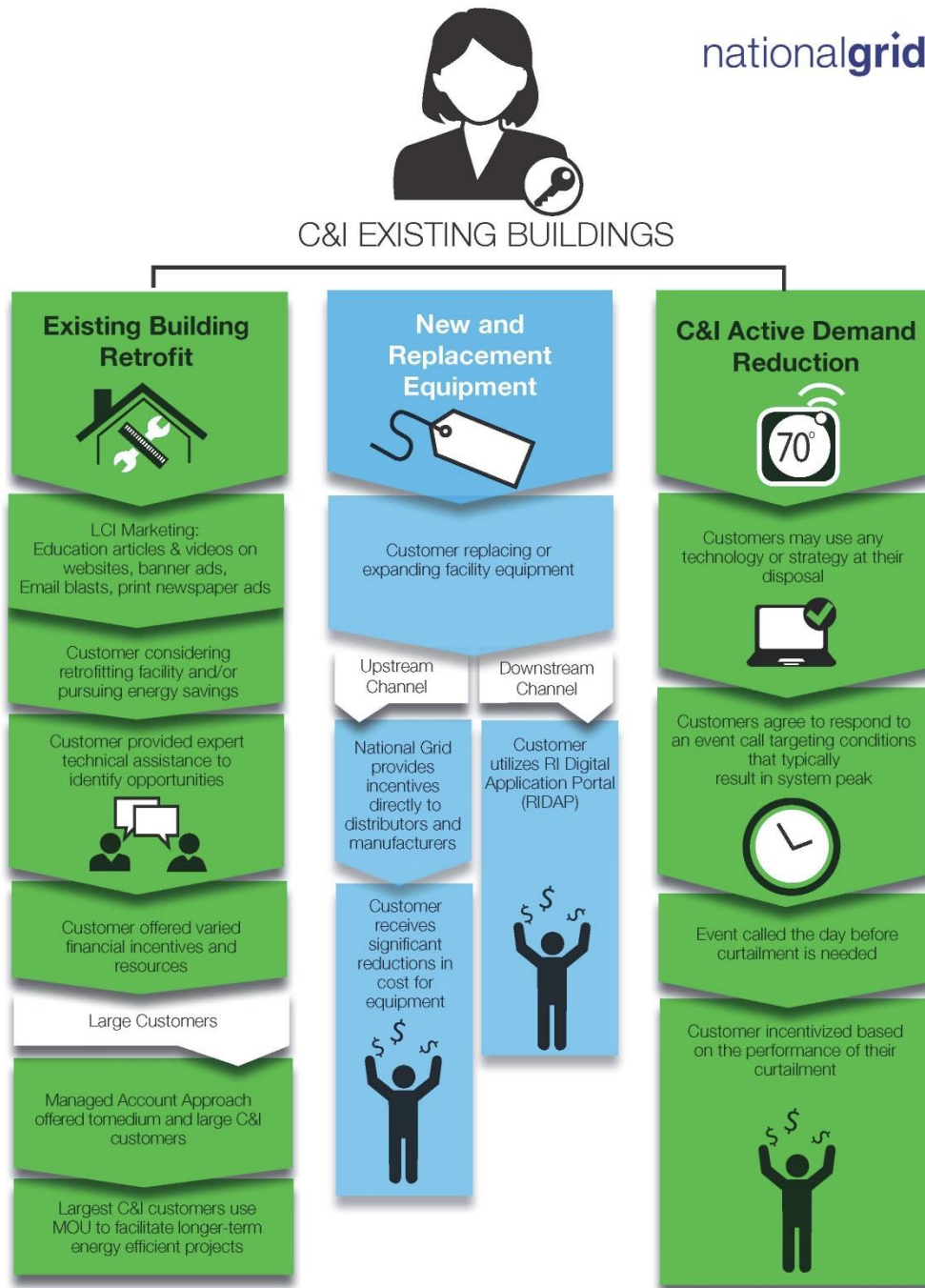
| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 312,931                 | 41,132                | 8,490   | 840,524                                     | 25,132         | 2,239         |

**Large Commercial Retrofit – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 1,332,508            | 142,888            | 4,969          | 62            |



Figure 6. Large Commercial Retrofit Program (Existing Buildings)



The figure above describes the pathways through which the Company delivers programs to existing buildings.

## 5. Initiatives Specific to Large Commercial Retrofit Program

### 5.1. Grocery Initiative

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| 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 education sessions. Primarily supports electric measures.   |
| Implementation and Delivery | <p>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.</p> <p>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.</p> <p>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.</p> |
| Customer/Vendor Feedback    | <p>Customer feedback flows through the ESG vendor to internal parties at National Grid.</p> <p>OER and its consultants have provided feedback to the Company, which is currently under consideration.</p>   |

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| Changes for 2022      | The Company is proposing a change to the vendor’s performance-based compensation structure for the 2022 program year, which would place greater emphasis on non-lighting measures and relatively less emphasis on lighting measures.   |
| Rationale for Changes | Advance the goal of delivering more non-lighting savings.  |
| Notes                 | The Company is conducting an assessment investigating the energy 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

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| Eligibility Criteria        | The Industrial Initiative offerings are available to all manufacturing and industrial customers.  |
| Offerings                   | <p>The following assistance and incentives are provided under the Industrial Initiative: technical assistance; project management; measure incentives; installer and customer education 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.</p> <p>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 2022, 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.</p> |
| Implementation and Delivery | <p>The National Grid Sales Representative is responsible for identifying customers or “leads” for the Industrial Initiative Vendor to pursue. The Company and vendor’s trade allies provide additional leads.</p> <p>Although there is no single process for customer engagement, the vendor typically conducts: billing data analysis, an initial site</p>   |

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|  | <p>visit, a follow-up report and discussion, development of savings calculations, contractor selection assistance, project management, and EE program application support.</p> <p>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: 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.</p> <p>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.</p> <p>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 Company's Customer Relationship Management (CRM) system.</p> <p>The Industrial Initiative works closely with the customer's facility staff and contractors to develop workbooks to calculate potential savings and incentives. A "tech check" is submitted to National Grid 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.</p> <p>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</p> |
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|                          | <p>may include formal status meetings between the Company’s Sales Representative and the Industrial Initiative vendor.</p> <p>National Grid works with the Industrial Initiative vendor to continually engage customers, identify new opportunities, and realize more comprehensive energy savings.</p>   |
| Customer/Vendor Feedback | <p>The Company’s industrial team has a monthly call to explore challenges and opportunities facing the program, much of which is based on the vendor’s interactions with customers and contractors.</p> <p>A wide range of feedback is captured during in these calls. For example, the Company worked with the vendor to identify industrial customers with limited historic participation and implemented tactics to engage these customers.</p> <p>The vendor also proposed several strategies to help the Sales team, including personalized emails to industrial customers highlighting current program offerings, customer-specific load analyses, and engagement videos.</p> <p>The vendor also explained that the greatest savings can be captured from “gold mine” customers with expansive energy consumption and inefficient equipment, as well as those expanding production lines or updating facilities.</p> <p>OER and its consultant team provided feedback on potential changes to the scope of work with the industrial vendor.</p> |
| Changes for 2022         | <p>The initiative will expand outreach to customers in the 200 to 400 kW range to encourage greater participation by small- and medium-sized industrial customers.</p>  |
| Rationale for Changes    | <p>Historically, the Industrial Initiative has primarily targeted large C&amp;I customers to ensure economies of scale. Expanding outreach to mid-sized customers will improve parity among customer sizes and may capture projects with rapid paybacks.</p>  |
| Notes                    | <p>Since 2016, the Industrial Initiative has helped diversity the Electric portfolio, with 66% of savings deriving from non-lighting measures, especially compressed air (17%), process (15%), HVAC 14%, and motors &amp; drives (9%) – as well as contributing significant Gas savings.</p>  |

### 5.3. National and Regional Restaurant Initiative

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| Eligibility Criteria        | <p>The Serve Up Savings (SUS) initiative serves regional 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.</p>  |
| Offerings                   | <p>Technical assistance, project management, incentives, collaboration with franchisors to develop a package of efficiency measures that will work for their franchisees.</p>  |
| Implementation and Delivery | <p>Serve Up Savings is a vendor-driven initiative designed to minimize the effort needed for the customer to participate in the program and promote common measures employed in this sector. The first interaction is a discussion with a Serve Up Savings Account Manager to introduce the program and schedule an audit of their stores. Typically, this entails an outgoing call to a customer, but eligible customers that contact the Company or implementation vendor should be directed to the Account Manager.</p> <p>Once the audits have been completed, 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.</p> <p>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.</p> |
| Customer/Vendor Feedback    | <p>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.</p>   |
| Changes for 2022            | <p>No changes.</p>   |

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| Rationale for Changes | No changes expected. |
| Notes                 |                      |

#### 5.4. Telecommunications Initiative

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| Eligibility Criteria        | This 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 | <p>This program is administered by the vendor. The Company's sales representatives work in concert with vendor staff members to develop a relationship with the prospective customer. Once the relationship is established, the Telecommunications Initiative offers no-cost audits to the customer. This audit documents and identifies energy efficiency opportunities for the location's HVAC, HVAC controls, airflow management, VFS and fan optimization. Once the audit is complete, a report is generated and presented to the customer.</p> <p>The Telecommunications Initiative works with the customer's contractor to obtain a quote for the work. If the customer decides to move forward with the project, the Telecommunications Initiative vendor will generate an application, collect all necessary paperwork, and submit to National Grid for pre-approval. Once the project is complete, the Telecommunications Initiative vendor will collect all invoices and final signatures and complete a post-inspection verification to ensure the measures are installed as intended. The Telecommunications Initiative vendor will submit all paperwork to National Grid and notify the customer when the incentive check is in the mail.</p> |
| Customer Feedback           | Initial feedback indicates that customers are appreciative of an offering customized to their needs from a vendor who has executed on this concept in other areas of the country.  |
| Changes for 2022            | The Company does not anticipate any changes in 2022.   |
| Rationale for Changes       | No changes are expected as this initiative launched recently and just started delivering audits and reports to customers in Q1 2021.   |

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### 5.5. Strategic Energy Management Planning (SEMP)

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| Eligibility Criteria | <p>The Strategic Energy Management Plan (SEMP) Initiative is available to the Company’s largest C&amp;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.</p>   |
| Offerings            | <p>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 provides the customer the opportunity to think long-term about their energy needs and equipment, resulting in more comprehensive savings compared to traditional energy efficiency programs. Where appropriate and valued by the customer, automated benchmarking will be available to help demonstrate the impact energy efficiency measures can have on the energy usage of the facilities.</p> <p><b>Colleges and Universities</b></p> <p>Colleges and universities 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 have established sustainability goals and climate action plans to reduce their greenhouse gas emissions. The Company’s SEMP initiative allows enrolled universities to engage in multi-year campus energy planning and assists them in identifying comprehensive and long-term energy efficiency opportunities. The Company has SEMP agreements in place with eight colleges and universities, five of which are participating in the SEMP, and three participating through the State of Rhode SEMP as State universities.</p> <p><b>Commercial and Industrial</b></p> |



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|                             | <p>While the Industrial Initiative remains the most common pathway for commercial and industrial participation, the SEMP Initiative offers a longer-term, strategic engagement that is focused on achieving multi-year goals. In order to achieve success in this multi-year engagement, the customer must have energy goals and targets, dedicated personal, and organizational support. The Company has a dedicated SEMP sales lead that can assist customers in setting energy goals and receiving organizational buy-in. Currently the Company has one commercial customer participating in the SEMP offering.</p> <p><b>Chain Restaurants</b><br/> Most chain restaurants are served through the Company’s large commercial programs; however, the SEMP pathway is also an option for chain restaurants that are looking to pursue multi-year engagement strategies. The Company currently has one large chain restaurant participating in the SEMP offering.</p> <p><b>Health Care, Manufacturing, Industrial Campuses, and More</b><br/> The SEMP Initiative is available to the Company’s largest C&amp;I customers, including the health care industries, manufacturing facilities, industrial campuses and more. As mentioned above, 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. The Company remains ready to work with customers on establishing goals, creating organizational buy-in, and getting the customer MOU-ready to participate in the SEMP initiative.</p> |
| Implementation and Delivery | <p>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 single measure or single year approach.</p>  |

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|                       | <p>Typically, the MOUs include a commitment by upper management, the establishment of specific and aggressive energy efficiency saving targets, measurement and verification strategies to document savings throughout the target facilities, and support 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:</p> <ul style="list-style-type: none"> <li>• Customer’s total kwh and therm usage on all accounts</li> <li>• Customer’s percentage of energy reduction over the last 5 years through EE measures</li> <li>• Customer’s capital project plan</li> <li>• High level measure identification by the Company’s TA vendor for potential savings over the 3-year SEMP</li> </ul> <p>The SEMP offering goes 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.</p> <p>The Company currently has seven SEMP MOUs. Five are large university campuses, one is with a large chain restaurant, and one with a large commercial customer. In addition, a State SEMP has been in place since 2016. The State SEMP focuses on State facilities, including office and administrative buildings, and public universities.</p> |
| Customer Feedback     | <p>One customer commented that the MOU process is streamlined and easy to work with. The Company’s implementation staff work closely with participating and potential SEMP customers to continuously identify new opportunities to improve the program.</p>   |
| Changes for 2022      | <p>The Company is in the process of attempting to recruit two additional SEMP Customers.</p>  |
| Rationale for Changes | <p>The Company is seeking to diversify its participation to include healthcare facilities.</p>  |
| Notes                 | <p>In 2022, the Company will continue to market the SEMP initiative to colleges and universities in Rhode Island that have not yet participated in the offering. Likewise, the Company will continue to search for recruitment opportunities from highly motivated industrial customers, including but not limited to chain restaurants, colleges and universities, manufacturers, health care, and cities.</p>   |

5.6. Municipal and State Buildings SEMP

|                             |  |
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| <p>Eligibility Criteria</p> | <p>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.</p>   |
| <p>Offerings</p>            | <p>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.</p> <p>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.</p> <p><b>Project/Energy Management Support:</b> 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.</p> <p><b>Implementation Support:</b> 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:</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul> |

|                             |  |
|-----------------------------|--|
|                             | <ul style="list-style-type: none"> <li>• The Company supports municipal engagement in OER and programs like vendor selection, engineering support, and implementation of upgrades through the energy efficiency programs.</li> <li>• 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.</li> </ul> <p>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.</p> |
| 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 2022            | <p>The SEMP will <b>target a 10% reduction in energy use by the above stated facilities by 2023.</b></p> <p>The Company will <b>work with multiple State agencies on exterior lighting projects.</b></p>   |
| 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 (ESPO)

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| <p>Eligibility Criteria</p> | <p>The Equipment &amp; Systems Performance Optimization (ESPO) Initiative is available to all C&amp;I customers averaging greater than 2,000 building operating hours a year. The ESPO initiative helps customers optimize the efficiency of their HVAC, refrigeration, compressed air, and steam systems. The systems optimization may include retro-commissioning (RCx), operations &amp; maintenance (O&amp;M), and Monitoring-Based Commissioning (MBCx). This initiative falls within the Large Retrofit Program. The ESPO program is a means of capturing savings and may be delivered through other initiatives (such as the State SEMP or Industrial Initiative).</p>  |
| <p>Offerings</p>            | <p>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 three pathways are:</p> <p><b>Low-Cost Tuning</b> offers prescriptive incentives to customers that have isolated items for systems 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 RCx vendors. re-approval for implementation had been required before the customer or outside party can receive an incentive on the installation. The Company is developing guidelines for documenting baseline conditions to enable program participants to implement <i>some</i> Low-Cost Tune-Up measures without pre-approval. Incentives are provided to sites where the baseline condition and proposed upgrade are documented through a simple data input, which is used to determine savings at the measure level. Only selected HVAC, steam, refrigeration, and compressed air measures are eligible for prescriptive incentives. Customers participating in the two other ESPO pathways described below may opt to apply for Low-Cost Tuning incentives, eliminating the need to submit custom savings calculations.</p> <p><b>Targeted Systems and Whole Building &amp; Process Tuning</b> offer a custom RCx approach. Targeted Systems Tuning offers an in-depth investigation of specific process or end-use. The Whole Building and Process Tuning offers a comprehensive approach to RCx for customers with a functional control system in place and electric</p> |

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|                             | <p>usage greater than 5,000,000 kWh annually. Investigation funds of up to \$12,000 are available for System Tuning and \$30,000 for Whole Building &amp; Process Tuning. Incentives of \$0.17 per kWh and \$1.20 per therm of savings are offered for measures implemented through this pathway. 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.</p> <p><b>MBCx</b> is a process intended to maintain and continuously improves building performance over time achieved through monitoring and analysis of large amounts of data. Also known as real-time energy management, this approach requires the installation of a software platform and monitoring equipment that captures and analyzes operational data from a facility's building automation system. Larger systems may continuously monitor hundreds of control points within a building. MBCx systems can provide fault detection and diagnostics capabilities, meaning building operators can find equipment that is not operating as intended due faulty programming, current settings (e.g. scheduling or setpoints), damaged equipment, or simply systems in need of maintenance. The MBCx pathway is similar to the Whole Building and Process Tuning approach in that most savings calculations are custom; however, this pathway assumes that identified measures will persist for at least three years. The current MBCx incentive is \$0.17 per kWh and \$1.20 per therm on a pay-for-performance basis. Beginning in 2022, the Company intends to begin funding MBCx set-up costs to share the risk taken on by customers adopting these systems. Through this process, the Company will also ensure an effective implementation by highly qualified vendors. For systems where the Company incentivizes set-up costs, there will be a reduced pay-for-performance rate. Furthermore, to ensure customers act on insights from the MBCx platform, customers and system implementers will be required to sign a participation agreement that obligates them to install and report savings from certain low-cost measures.</p> |
| Implementation and Delivery | A customer typically begins the process for ESPO by contacting their National Grid Sales representative – or an RCx contractor may reach out on behalf of the customer. Before undertaking an ESPO project,  |

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|                          | <p>account and technical representatives work with the customer and their implementers to identify the appropriate pathway(s). Typically, a retro-commissioning consultant will complete an investigative report, the results of which are shared with the customer and used as the basis for calculating project savings. The ESPO process may also identify additional capital projects that reduce energy consumption and can secure additional incentives.</p> <p>The Company may also facilitate the transfer of information (potentially including electric interval data) from a controls vendor to a third-party RCx vendor or technical assistance vendor with expertise in building controls.</p>  |
| Customer/Vendor Feedback | <p>In 2021, the Company held in-depth discussions with at least ten RCx and MBCx vendors, customers, and industry experts (including EERMC consultants) to capture feedback on current and potential offerings. These discussions are ongoing as of Q3 2021 and have thus far led to the planned changes described here.</p> <p>The Rationale for Changes section summarizes much of this feedback. Of note, one expert mentioned there are numerous firms RCx providers in the Northeast, and the existing workforce is sufficient to support the planned efforts, though training in ASHRAE Guideline 36 could enhance their expertise.</p>  |
| Changes for 2022         | <p>The Company will allow some tuning measures to be implemented without pre-approval, provided baseline conditions are documented sufficiently to withstand M&amp;V scrutiny. A study is currently underway to determine the extent to which this is feasible at RI schools and to develop a methodology for documenting baseline conditions and calculating savings for HVAC measures commonly found at schools.</p> <p>The Company will begin funding MBCx set-up costs to mitigate risk to customers adopting these systems. Customers that take advantage of set-up incentives will receive reduced pay-for-performance rates and must sign a participation agreement (along with their system implementers) to help ensure measures identified are installed and savings are reported.</p> <p>The Company will develop an ESPO guidebook or similar resource to help standardize the process of completing and documenting RCx</p> |

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|                              | <p>savings calculations and classifying different measure types. This should assist customers and trade allies participating in the MBCx and System and Whole Building pathways.</p> <p>The Company is investigating the possibility of adding Low-Cost Tuning measures, including a CHP system tune-up as well as gas measures such as unit ventilator adjustments. This effort can only proceed if sufficiently broad savings calculations can be developed.</p> <p>The Company is exploring opportunities to improve the persistence of RCx measures for customers (e.g., building operator education efforts, controls reprogramming), revisiting measure life assumptions, and seeking to better integrate ESPO with other controls offerings.</p>   |
| <p>Rationale for Changes</p> | <p>Increasing participation in the ESPO program is a major focus in 2022. Energy Management Systems (EMS) show the second-highest savings among Electric non-lighting measures in the Market Potential Study. Although ESPO is designed to improve the performance of existing systems, MBCx and Tuning investigations very often lead to the installation of new EMS equipment or reprogramming of controls treated as EMS' for program purposes (New Construction or Retrofit, depending on the situation).</p> <p>The option to waive pre-approval for tuning measures will enable building auditors/RCx agents to implement many measures in a single trip, eliminating the need for a return trip (and the associated cost and time lag).</p> <p>For MBCx, set-up costs were identified as the primary barrier to broader adoption. Implementation quality is also a significant barrier. The Company is developing a set of vendor qualifications to ensure quality implementation, as well as a customer agreement that will help ensure measures identified are installed and savings are reported.</p> <p>Calculating savings and classifying RCx and controls measures has posed a significant challenge for ESPO participants and created an administrative burden for program implementation staff. The guidebook will answer common questions and eliminate points of confusion.</p> |



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|       | <p>CHP tune-ups present a new savings opportunity. Likewise, program staff have suggested unit ventilators and other gas measures located in occupied building zones (as opposed to heating and cooling equipment located in mechanical rooms) frequently need significant tuning or repairs. This may be an excellent opportunity in schools.</p> <p>The Company currently claims short measure lifetimes from many ESPO measures, limiting the lifetime benefits. The Company has identified tactics to improve measure persistence in some cases (for example, HVAC system scheduling can be improved by ensuring building operators receive proper training and by programming certain resets or functionality to ensure control sequences are not permanently overridden.) Also, numerous M&amp;V studies in other utility jurisdictions have suggested significantly longer measure lifetimes than National Grid currently claims for ESPO measures.</p> |
| Notes | <p>The ESPO initiative captures savings from 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.</p> <p>Savings from this initiative are spread throughout several Retrofit programs (<u>Electric</u>: HVAC, Compressed Air, and Refrigeration; <u>Gas</u>: Custom, HVAC, Retro-commissioning, and Steam Traps). MBCx systems and Tuning investigations can also identify opportunities for new controls or replacement of poorly functioning equipment, which falls within the New Construction program.</p>  |

### 5.8. Lighting Designer Incentives (LDI)

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| Eligibility Criteria | <p>LDI is offered to lighting design teams for qualifying New Construction/Major Renovations or Existing Buildings Performance Lighting projects.</p> <p>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</p> |
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|                             | <p>construction and design community. Lighting designers cannot sell product for the project that they are receiving LDI.</p> <p>Lighting designer must have at least one of the following qualifications:</p> <ul style="list-style-type: none"> <li>• Lighting Certified (LC) – granted to those who successfully complete the NCQLP (National Council on Qualifications for the Lighting Professions) Lighting Certification Examination;</li> <li>• CLEP – certification from the Association of Energy Engineers (AEE);</li> <li>• IALD – International Association of Lighting Designers Professional Membership status; or</li> <li>• CLD – the IALD sponsored Certified Lighting Designer, certification.</li> </ul>  |
| Offerings                   | <p>This incentive goes directly to the lighting design team to fund their efforts to achieve lighting energy savings while maintaining quality lighting design.</p> <ul style="list-style-type: none"> <li>• LDI is a sum equal to 20% of the customer lighting incentive offered for a project if project reaches Performance Lighting Tier 2</li> <li>• LDI is a sum equal to 15% of the customer lighting incentive if the project reaches Performance Lighting Tier 1</li> <li>• LDI is sum equal to 10% of the customer lighting incentive for all other projects.</li> </ul> <p>There is a \$15,000 maximum per project.</p>  |
| Implementation and Delivery | <p><b>Lighting designer submits LDI application for a project</b></p> <p>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.</p> <p>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.</p> |

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| Customer Feedback      | LDI needs to inform customers about the benefits of hiring a lighting designer.  |
| Changes for 2022       | The Company will create a one-page document that articulates the benefits of hiring a lighting designer that can be mailed, emailed, posted online to educate potential customers. |
| Rationales for Changes | Incentives have been recalibrated to encourage reaching higher tiers in Performance Lighting.  |
| Notes                  |  |

## 6. Performance Lighting (Retrofit)

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| Eligibility Criteria | <p>Any customer with a commercial meter is eligible to participate in this initiative. All projects that qualify under this incentive must:</p> <ul style="list-style-type: none"> <li>• Average a minimum of 2,000 lighting operating hours per year (before controls).</li> <li>• 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.</li> </ul>   |
| Offerings            | <p><b>Incentives</b><br/> Incentives will be offered in two tiers.</p> <p><b>Tier 1 – Performance Lighting – LED lighting with Luminaire Level Lighting Controls or Wirelessly Accessible Controls</b></p> <p>This pathway offers an incentive of \$.85 per gross kWh saved and must meet the following requirements -</p> <ul style="list-style-type: none"> <li>• 80% of lighting project load must be controlled LED fixtures (DLC QPL listed or National Grid approved), with all controlled LED fixtures wirelessly accessible to initialize, configure, and commission. Individual fixture addressability and Luminaire Level Lighting Control (LLLC) as outlined by DLC is optional. The project must include and demonstrate a minimum of one control strategy per fixture and two different control strategies at the project level (e.g. occupancy, daylighting, task tuning/high end trim). If luminaires are not LLLC, National Grid will consider “room based” controls on a case by case basis.</li> </ul> |

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|                                    | <p><b>Tier 2 -Performance Lighting – LED Fixtures with Networked Lighting Controls System</b></p> <p>This pathway offers an incentive of \$1.10 per gross kWh saved and must meet the following requirements -</p> <ul style="list-style-type: none"> <li>80% of project load must utilize a networked lighting control system, as defined by DLC. The system must be capable of energy monitoring and demand response, as defined by DLC. The customer or their representative must also provide a control narrative for the system with a minimum of two different control strategies at the project level (e.g. occupancy, daylighting, task tuning/high end trim and it must be fully commissioned with reporting. National Grid recommends that these systems demonstrate demand response capability.</li> </ul>  |
| <p>Implementation and Delivery</p> | <p><b>Application Forms</b></p> <ul style="list-style-type: none"> <li>Applications for Performance Lighting Plus incentives are made available through vendors, 3<sup>rd</sup> party implementers, and Customer Solution Sales Team. However, applications can also be created and submitted online using the Rhode Island Application Portal (RIAP).</li> </ul> <p><b>Pre-Approval Requirements</b></p> <ul style="list-style-type: none"> <li>The Customer must submit a copy of the Manufacturer’s technical specification sheets (“cut sheets”) for each type of eligible equipment to be purchased.</li> <li>Once pre-approved, a “pre-approved incentive letter” will be issued.</li> </ul> <p><b>Installation and Incentive Requirements</b></p> <ul style="list-style-type: none"> <li>Once pre-approved, the customer must purchase and install the qualifying equipment within twelve (12) months of National Grid’s pre-approval</li> <li>Next, the Customer must return the following required information to National Grid within 30 days of the installation: <ul style="list-style-type: none"> <li>A copy of the completed and signed pre-approval application</li> </ul> </li> </ul> |

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|  | <ul style="list-style-type: none"><li>o 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</li><li>o 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</li><li>o At the post-installation verification, the customer must sign the post-installation customer acknowledgement section of the original application</li></ul> <p><b>Application Process and Requirement for National Grid Approval</b></p> <ul style="list-style-type: none"><li>• 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.</li><li>• To be eligible for performance lighting plus incentives, a customer must have an active electric account.</li><li>• 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.</li><li>• National Grid reserves the right to approve or disapprove of any application or proposed performance lighting plus incentive.</li><li>• 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</li></ul> |
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|                       | <p>required for the Program. In such an event, the customer must submit to National Grid the following:</p> <ul style="list-style-type: none"> <li>o Completed and signed Program rebate form</li> <li>o Original date receipts for purchase and installation of energy efficiency measures, and</li> <li>o Any other required information or documentation within such time as Program Materials indicate.</li> </ul> <p><b>Pre- and Post-Installation Verification; Monitoring and Inspection</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul> |
| 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 2022      | National Grid has worked with the consultants to the EERMC to alter incentives and requirements to encourage the adoption of luminaires and systems that offer more savings and flexibility of control. In addition, the incentives are structured in such a way that should be more transparent to vendors allowing for increased throughput. The incentives and requirements are modeled on a successful offering in Connecticut.  |
| Rationale for Changes | <ul style="list-style-type: none"> <li>• Incentive transparency for customers and their advisors to increase program participation.</li> <li>• Move the market forward for luminaires and systems with additional savings and capabilities.</li> <li>• Increase the deployment of demand responsive lighting</li> </ul>  |

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| Notes | Performance Lighting may also be utilized in New Construction applications as well. Please see the New Construction portion of this attachment for more details. |
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### 6.1. Customer Owned Streetlight Equipment

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| 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 of 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 Public Utility Commission 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, the customer must contact 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 |

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|                       | completed location listing of the LED conversions is required for the billing system updates to realize any energy consumption savings.   |
| Changes for 2022      | No changes are anticipated for 2022.  |
| Rationale for Changes | The majority of RI streetlight infrastructure has successfully been converted to LED's, in large part due to the Company's efforts.   |
| 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. |

## 6.2. Company Owned Streetlight Equipment

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| 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. |
| Changes for 2022            | The Company Owned Streetlight Equipment will remain unchanged for program year 2022.   |
| Rationale for Changes       | No changes are anticipated for program year 2022.  |



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| Notes | <p>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.</p> <p>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.</p> |
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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   |
|------------------------------------|---|---|
| <b>LED Fixture</b>                 | 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 |
| <b>Energy Efficiency Incentive</b> | Customer receives a one-time incentive payment for the installation of LED equipment (after | Customer receives a one-time incentive payment for the installation of LED equipment (after satisfactory post-                            |

| Distinction              | Customer-Owned   | Company-Owned   |
|--------------------------|--|---|
|                          | satisfactory post-inspection by National Grid)   | inspection by National Grid)  |
| <b>Purchase/Lease</b>    | Customer purchases the equipment   | National Grid leases the equipment to the customer                                      |
| <b>Outreach</b>          | 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 |
| <b>Technical Support</b> | Customer is responsible  | Customer is responsible   |

### 6.3. Farm/Agriculture

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| 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, |

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|                             | farmers may be eligible to participate in the Rhode Island Agricultural Energy Program grant. <sup>4</sup>   |
| Implementation and Delivery | National Grid engages with customers through targeted outreach, while also providing additional information via the Office of Energy Resources website. <sup>5</sup> 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. |
| 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.<br><br>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 2022            | None.  |
| Rationale for Changes       | No changes to the Farm and Agriculture initiative for program year 2022.   |
| Notes                       |  |

#### 6.4. Combined Heat and Power Initiative

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| Eligibility Criteria | <p>To qualify for a Combined Heat and Power (CHP) energy efficiency incentive, a proposed project, no matter the size, must meet the following conditions:</p> <ul style="list-style-type: none"> <li>• Host customers must be in the franchise service area of the Company.</li> <li>• 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</li> </ul> |
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<sup>4</sup> <http://www.energy.ri.gov/policies-programs/programs-incentives/farms.php>

<sup>5</sup> <http://www.energy.ri.gov/policies-programs/programs-incentives/feep.php>

|           |  |
|-----------|--|
|           | <p>energy or waste heat to generate electricity, or (iii) electric load following and meeting a total system efficiency greater than 55%.</p> <ul style="list-style-type: none"> <li>• Both new construction and retrofit installations are eligible; in either case, the baseline system must be documented.</li> <li>• The overall minimum total system efficiency of the proposed CHP units must be 55% or greater.<sup>6</sup> System efficiency is calculated as Annual Useful Energy/Annual Natural Gas Input where<br/> <math display="block">\text{Annual useful energy} = \text{Net Annual kWh} * 3,413 / 100,000 + \text{utilized thermal output (therms)}</math> <math display="block">\text{Annual natural gas input} = \text{CHP gas input in therms (HHV)}</math> </li> <li>• 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.</li> <li>• 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.</li> <li>• The project must pass cost effectiveness screening.</li> </ul> <p>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.</p> |
| Offerings | <p>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</p>  |

<sup>6</sup> The RI DEM's Air Quality Regulations ([http://www.dem.ri.gov/pubs/regs/regs/air/air43\\_12.pdf](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.

less.<sup>7</sup> 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 $\geq 55\%$ - $< 60\%$   | \$900 per net kW   |
| CHP with total system efficiency $\geq 55\%$ - $< 60\%$ 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 |
| CHP with total system efficiency $\geq 60\%$  | \$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 $\geq 60\%$ with customer implementing energy efficiency measure equal to 5% of site energy or maximum load reduction            | \$1,250 per net kW |

For the purpose of determining the non-variable incentive level, the Company has defined opportunity fuels, renewable natural gas and

<sup>7</sup> 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.

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|  | <p>biogas as gaseous fuels derived from the biological breakdown of waste.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> |
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|                                    | <p>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.</p>  |
| <p>Implementation and Delivery</p> | <p><b>Identification and Recruitment of Qualified CHP Projects</b></p> <p>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.</p> <p><b>Targeted Outreach and Support for Potential CHP Customers</b></p> <p>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. 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 the management of the system will be outsourced, and providing easier customer access to CHP unit performance data.</p> <p><b>Installation of Incremental or Additional Energy Efficiency Measures for Customers who have Previously Installed CHP</b></p> |

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|  | <p>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.</p> <p>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.</p> <p>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.</p> <p><b>Scoping Study/Qualification</b></p> <p>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:</p> |
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|  | <ul style="list-style-type: none"> <li>• Monthly (or hourly, where available) electric, gas, and other fuel usage</li> <li>• All site-specific forms of thermal energy end uses</li> <li>• Coincidence of electric and thermal loads</li> <li>• Proposed project cost</li> <li>• 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</li> </ul> <p>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.</p> <p><b>Technical Assistance Study</b></p> <p>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 45% below the 1990 levels by 2030; 80% below 1990 levels by 2040; and net-zero by 2050. (On-peak kW reduction = Net Output x Availability x % Loaded.) This kW load reduction should be used in the benefit-cost screening.</p> |
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|  | <p>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.</p> <p><b>Cost Effectiveness</b></p> <p>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 these 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. <b>Other</b></p> <p><b>Contract Terms and Guidelines</b></p> <p>In order to ensure proper operation of the CHP facility and persistence of energy savings, the following terms and guidelines will be required:</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul> |
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|  | <ul style="list-style-type: none"> <li>• All systems greater than one MW will require electric, thermal and gas metering for commissioning and monitoring of system efficiencies.</li> <li>• 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.</li> <li>• The customer must sign and produce a contract for O&amp;M services through the first planned major overhaul of the CHP unit after post installation commissioning. On-going O&amp;M contracts for a minimum of 10 years from project commissioning are recommended.</li> <li>• Customers applying for interconnection of a CHP systems must not operate the unit until they receive the authorization to interconnect from the Company.</li> <li>• 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.</li> </ul> <p><b>Qualification</b></p> <p>The cost of the project will be provided by a design/build or general contractor experienced with CHP projects and revised as necessary.</p> <p><b>Options for a CHP proposal that fails cost effectiveness testing</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Identifying other load reduction opportunities at the facility. Benefits can be garnered from load reduction in lieu of achieving that load reduction through CHP.</li> </ul> <p><b>Attribution of CHP Energy Savings to the Company</b></p> |
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|  | <p>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.</p> <p><b>Notification Process</b></p> <p>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:</p> <ul style="list-style-type: none"><li>• 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:<ul style="list-style-type: none"><li>• 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;</li><li>• Documentation from the customer on all relevant leases, agreements or commitments related to the CHP system or incentive offer;</li><li>• Estimated project budget.</li></ul></li><li>• 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</li><li>• 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.</li></ul> <p>For any proposed CHP project greater than one MW:</p> |
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|                          | <ul style="list-style-type: none"> <li>• The Company will submit a project description to the Division, providing all the pertinent details relating to the project.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• To the extent that additional review time is required, the Division will provide notification to the Company.</li> <li>• 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.</li> </ul> <p>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.</p> |
| Customer/Vendor Feedback | <p>Vendors and customers provided feedback in advance of the 2021 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.</p>   |

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|  | <p>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.</p>   |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <p>Participation and Savings</p>   | <p>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 &amp; Carriers, 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.</p> <p><i>Table 5. Pipeline of RI CHP Projects with TA Study Initiated</i></p> <table border="1"> <tr> <td><b>Customer Name or Company Name*</b></td> <td>Schartner Farms</td> </tr> <tr> <td><b>Approximate Size of CHP (kW and Net Lifetime MWh)</b></td> <td>13.3 MW,<br/>311,562 Net Lifetime MWh</td> </tr> <tr> <td><b>Feeder</b></td> <td>49-56-88F1</td> </tr> <tr> <td><b>Substation</b></td> <td>Tower Hill Substation</td> </tr> <tr> <td><b>Gas Line ID</b></td> <td>416612250</td> </tr> <tr> <td><b>Current Status (Scoping, Study, Notification Process, Under Construction, Post-Inspection or Commissioning)</b></td> <td>Notification Process</td> </tr> </table> | <b>Customer Name or Company Name*</b> | Schartner Farms | <b>Approximate Size of CHP (kW and Net Lifetime MWh)</b> | 13.3 MW,<br>311,562 Net Lifetime MWh | <b>Feeder</b> | 49-56-88F1 | <b>Substation</b> | Tower Hill Substation | <b>Gas Line ID</b> | 416612250 | <b>Current Status (Scoping, Study, Notification Process, Under Construction, Post-Inspection or Commissioning)</b> | Notification Process |
| <b>Customer Name or Company Name*</b>  | Schartner Farms   |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <b>Approximate Size of CHP (kW and Net Lifetime MWh)</b>   | 13.3 MW,<br>311,562 Net Lifetime MWh  |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <b>Feeder</b>  | 49-56-88F1  |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <b>Substation</b>  | Tower Hill Substation   |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <b>Gas Line ID</b>   | 416612250   |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |
| <b>Current Status (Scoping, Study, Notification Process, Under Construction, Post-Inspection or Commissioning)</b> | Notification Process  |                                       |                 |  |                                      |               |            |                   |                       |                    |           |  |                      |

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|                       | <b>Estimated Year(s) in which the Company will claim energy savings</b>  | 2022 and 2023 |
|                       | *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. |               |
| Changes for 2022      | There are no program changes for 2022.   |               |
| Rationale for Changes | N/A  |               |
| Notes                 | The Company continues to explore alternative fuel options for CHP systems, such as renewable natural gas, hydrogen, biogas, and other opportunities fuels.   |               |

### 6.5. Products Offered Through “Upstream”

When the Company refers to an “Upstream” initiative it is referring to the practice of offering an incentive directly to a manufacturer or distributor (mainly distributors in Company initiatives) of efficient equipment instead of offering an incentive to the customer through an application form 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.

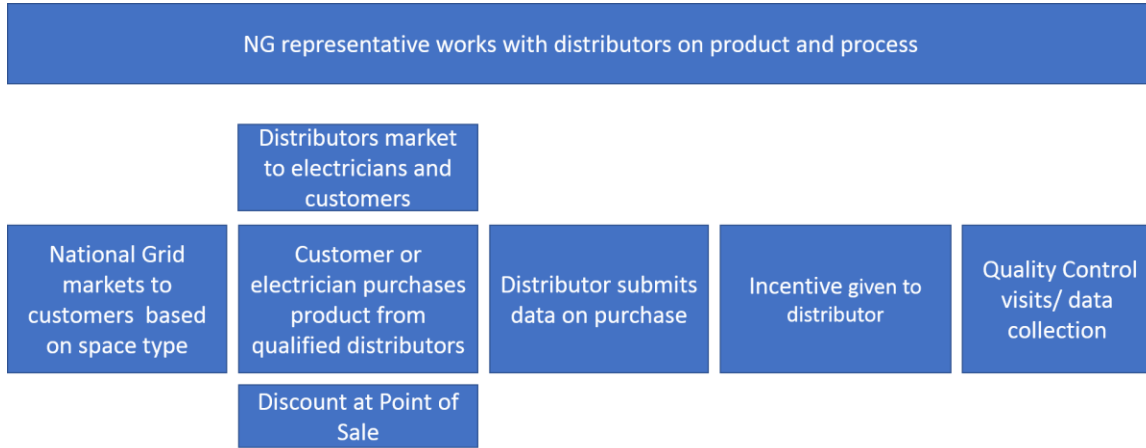
#### 6.5.1. Upstream Lighting

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|-----------------------------|--|
| 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. |

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| Customer Feedback     | The Company's implementation team regularly talks 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 2022      | <p>The 2022 plan will maintain increased incentive support and special promotions for luminaires with controls and Luminaire Level Lighting Controls (LLLCs).</p> <p>The Company will work with its vendor and its EM&amp;V team to try and capture more savings from LLLCs with better documentation at the distributor level. This may be part of a larger change where some measures are added and others are deleted as well as changing incentive emphasis on certain products.</p> <p>The Company will also continue to cross market between the different Upstream Initiatives.</p> |
| Rationale for Changes | Market transformation and increased savings.   |
| Notes                 | The Company will continue to investigate ways to increase stocking of luminaires with controls. Information has been collected through the Upstream vendor as well as anonymous surveys developed by National Grid staff in collaboration with the appropriate members of the EERMC Consultant team.   |



Figure 7. Implementation and Delivery Process for Upstream Lighting



### 6.5.2. Upstream HVAC

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| Eligibility Criteria        | The Upstream HVAC initiative is available to all C&I 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  |

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|                       | contractors is often as important to program success and design as direct end-customer feedback because contractors strongly influence customer equipment choices.   |
| Changes for 2022      | The 2022 plan accounts for a substantial increase in savings from this pathway compared with the 2021 plan due to high adoption in recent years. This success is a result of relationships the Upstream HVAC vendor has built with distributors and its success in promoting these measures.   |
| Rationale for Changes | The Company has been in discussions with the Upstream HVAC vendor to leverage the network of distributors participating in the Upstream HVAC program to deliver savings from downstream measures, including early replacement of aging HVAC equipment (rooftop units, boilers, hot water heaters, etc.) with new, high-efficiency equipment. The vendor’s initial proposal was cost prohibitive, and some proposed measures may not be cost effective (i.e., they may have benefit-cost ratios of less than 1.0). Thus, that effort has been excluded from the plan, but the Company is exploring future opportunities to leverage this network. |
| Notes                 | The Market Potential Study (MPS) identified “the installation of a higher efficiency ASHP instead of a standard ASHP in businesses with existing ASHP (i.e. does not result in heating electrification)” as the highest-potential non-lighting Electric measure. This program uses exactly that approach to support air-source heat pumps (calculating savings from high-efficiency units compared to a New Construction baseline rather than a Retrofit). The program incentivizes both VRF and small-scale air-cooled heat pumps.  |

### 6.5.3. Upstream Gas

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| Eligibility Criteria        | The Upstream Gas initiative is available to all commercial customers.   |
| Offerings                   | Discounted premium efficiency water heating equipment at the point-of-sale through qualified distributors. The 2022 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                         |

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|                       | 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 2022      | No changes.  |
| Rationale for Changes |  |
| Notes                 |  |

#### 6.5.4. Upstream Kitchen Equipment (Electric and Gas)

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| 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. |

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| 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. |
| Changes for 2022      | The Company has increased savings targets compared with the 2021 plan due to strong adoption in 2020. This success is due to the vendor’s positive relationships with distributors and outreach efforts.   |
| Rationale for Changes | Increasing non-lighting savings as found in the Market Potential Study (MPS).  |
| Notes                 |  |

### 6.6. Lodging Initiative

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| Eligibility Criteria | In 2021, the Company explored the possibility of launching a future lodging initiative to serve hotels, motels, and resorts – as well as on-premise laundry at commercial laundry facilities, hospitals, colleges, and lodging facilities.   |
| Offerings            | <p>In 2021, the Company employed an external vendor to <b>research 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</b>. The objective of this effort was to better understand the barriers facing this industry, and to identify specific efficiency technologies.</p> <p>Having concluded that research, the Company <b>does not</b> currently plan to launch a full-scale vendor-driven initiative that would offer technical assistance or project management at this time, but through research process the Company uncovered two opportunities on which it intends to act:</p> <ul style="list-style-type: none"> <li>• Creating an incentive to support the replacement of packaged terminal air conditioners with packaged terminal heat pump (PTHP) units optimized for cold weather use.</li> </ul> |

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|                             | <ul style="list-style-type: none"> <li>• Creating marketing materials targeted to lodging customers. These materials will provide information on efficiency upgrades commonly installed in hotels and motels, such as guest room energy management systems (GREMS), as well as lighting, kitchen, HVAC equipment, and demand response.</li> </ul>  |
| Implementation and Delivery | The Company continues to serve this market through existing sales channels. Large hotels and national chains are primarily targeted through the large C&I pathways, while small hotels may pursue the Small Business offering. Customers of all sizes may take advantage of the numerous offerings in our Upstream lighting, water heating, and HVAC initiatives.  |
| Customer Feedback           | This initiative is not currently active. Experts familiar with the sector have described the savings potential at lodging facilities, including significant opportunities to retrofit non-LED lighting, HVAC equipment, controls, and kitchen equipment. The sector was hit hard by COVID-19 and may experience continued headwinds if business travel declines permanently as remote conferencing has replaced in-person meetings.  |
| Changes for 2022            | In 2022, the Company will: (1) create an incentive to support PTHP units in 2022 along with research into customer barriers and (2) develop marketing collateral targeted to lodging customers.  |
| Rationale for Changes       | <p>Although the concept of a vendor-driven lodging initiative has potential, and the Company has not ruled it out for future plans, its current focus is to expand efforts like ESPO with the potential to increase savings across all customer segments.</p> <p>GREMS appear to be an effective means of communicating the efficiency benefits of advanced controls to customers. The wide range of baseline conditions found among various lodging facilities, combined with the range of upgrades available, suggest that a single, bundled GREMS measure would make savings calculations extremely complex; therefore, these systems will still be incentivized through existing program pathways.</p> <p>On-premise laundry solutions may be considered in the future but do not currently appear to provide consistent savings in the Rhode Island market. These systems typically require a modest increase in electricity consumption to reduce gas and water consumption, which makes financial sense in some regions (especially the</p> |

|       |   |
|-------|---|
|       | Southwest), but the high electricity prices, coupled with low gas and water pricing, makes this technology a poor fit for Rhode Island. |
| Notes |   |

### 6.7. 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 has paused the development of a commercial real estate (CRE) initiative. However, National Grid sales staff will continue to support and monitor conditions within this segment.   |
| Implementation and Delivery | <p>The CRE sector has specific challenges and barriers linked to the split incentive between building owners and tenants, as well as difficulty accessing decision makers.</p> <p>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.</p> <p><b>Benchmarking</b></p> <p>The Company provides automated benchmarking services for commercial office spaces that allows building owners to be aware of their building’s 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.</p> <p><b>Commercial Property Assessed Clean Energy (C-PACE)</b></p> <p>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.</p> <p>The Company will continue to refine its automated benchmarking capabilities in 2022. National Grid will work with partners such as the</p> |

|                       |  |
|-----------------------|--|
|                       | 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 that would like to make EE improvements but cannot do so in a way that is favorable to them due to lease terms.   |
| Changes for 2022      | <p>The Company will not develop a full-scale CRE initiative. However, a National Grid salesperson will continue to cover this market and monitor conditions in this segment.</p> <p>The Company is exploring the potential for a peer group strategy whereby local CRE owners and property managers share best practices. The Company is also investigating the most common office space energy efficiency opportunities, including lighting, HVAC, controls, and hot water measures, including retro-commissioning.</p> |
| Rationale for Changes | Office space is experiencing a period of contraction as many employers offer permanent work-from-home options. This will likely lead to a consolidation of office spaces, making CRE owners reluctant to invest in their properties. This uncertainty makes 2022 an inopportune time to pursue a full-scale CRE sector initiative.   |
| Notes                 |  |

## 7. 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 |

|                                    |   |
|------------------------------------|---|
|                                    | <p>measures. Turn-key install and OBR is offered to support the adoption of the recommended measures to the customer.</p> <p>A Customer Directed Option (CDO) is also available. In this pathway, customers may use their own electrician to install measures while the Small Business program vendor processes and submits all necessary paperwork to National Grid.</p>   |
| <p>Implementation and Delivery</p> | <p>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.</p> <p>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.</p> |
| <p>Customer/Vendor Feedback</p>    | <p>The Company's vendor collects insights and feedback from customers. National Grid's program managers regularly check in with the vendor to capture this feedback.</p> <p>In 2022, the Company will introduce a short, formal customer satisfaction and input survey. In addition to questions typical of a customer satisfaction survey, the Company will ask optional questions about whether the customer identifies as a woman, minority, or LGBT owned business. This will allow the Company to create a baseline of</p>   |



|                         |   |
|-------------------------|---|
|                         | <p>customers served. This survey will be offered in English, Spanish, and Portuguese.</p> <p>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.</p>   |
| <p>Changes for 2022</p> | <p>The Company will dramatically increase the volume of weatherization installations for customers using all types of fuels. This is possible due to a \$1,100,000 RGGI allocation to the Company from OER for this purpose that can be used in 2021 and 2022. The Company has committed to, at the request of OER, to prioritize marketing of these weatherization installations in areas hit hardest by the COVID pandemic. OER has defined hardest hit areas as Department of Health’s March 30, 2021 Hardest-Hit COVID zip codes: 02860, 02861, 02863, 02904, 02905, 02907, 02908, and 02909. The Company has estimated that 1/3 of the spend and benefits will take place/accrue in 2021 with the remainder deployed and captured in 2022.</p> <p>The Company has also incorporated two equity-related initiatives. First, the Company and its vendor will deploy bilingual auditors who speak either Spanish or Portuguese – the two most widely spoken languages besides English in Rhode Island.</p> <p>Second, in addition to collecting information about who is served by this program, the Company will continue to market services to Woman and Minority Owned Enterprises (WME). This effort will extend beyond the WME businesses registered with the state and will seek to develop relationships with groups such as the RI Black Business Association and the RI Hispanic Chamber of Commerce to determine how to better serve these businesses. The Company’s 2021 goal for increasing the ratio of luminaires and retrofit kits was not well defined. This year the Company sets the following goals to be reported on quarterly:</p> <ol style="list-style-type: none"> <li>1. Double the percentage of installed luminaires with one or more control strategies from 4% (Q2 2021) to 8%.</li> <li>2. Double the percentage of installed retrofit kits with one or more control strategies from 5% (Q2 2021).</li> </ol> |

|                               |  |
|-------------------------------|--|
|                               | In 2022, the Small Business vendor will educate customers on the benefits of participating in the ADR program using WiFi thermostats and provide information on how to enroll.   |
| 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 | The following studies will impact this Program: <ul style="list-style-type: none"> <li>• RI-22-CE-LightMar C&amp;I Lighting Market Characterization Study</li> <li>• RI-22-CX-Proc Small Business Process Evaluation</li> </ul> will be completed in 2022. |

**Small Business Direct Install – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Passive Demand Reduction kW (Electric) | Lifetime MMBtu (Electric Gas, Oil, Propane) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|---|---|----------------|---------------|
| Electric | 64,394                  | 9,976                 | 904   | 171,528                                     | 8,969          | 490           |

**Small Business Direct Install – Gas Program Goals, Metrics, Budgets, Participation for 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 91,700               | 6,113              | 356            | 170           |

**8. Connected Solutions (Active Demand Response)**

|                      |                                     |
|----------------------|-------------------------------------|
| Eligibility Criteria | Commercial and Industrial customers |
|----------------------|-------------------------------------|

|           |   |
|-----------|---|
| Offerings | <p>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 neutral.</p> <p><b>Targeted Dispatch</b> <i>(One to eight DR events per summer)</i></p> <p>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.</p> <p>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 (often in collaboration with National Grid’s implementation team), as well as demand charge and Installed Capacity (ICAP) tag<sup>8</sup> 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.</p> <p>Customers and CSPs respond to dispatch signals sent by the Company. Customers and CSPs are notified of events a day before the event. The core model remains focused on reducing demand during summer peak events, typically targeting fewer than twenty hours per summer. The</p> |
|-----------|---|

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<sup>8</sup> 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

|  | <p>program is structured to avoid interfering with the ISO-NE programs or penalizing customers for participating in both programs.</p> <p>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.</p> <p><b>Daily Dispatch</b> (40 to 60 DR events per summer)</p> <p>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 storage or thermal storage.</p>   |      |                  |      |                        |                      |                  |                 |      |      |      |      |      |      |  |    |    |    |    |                        |                      |
|--|---|------|------------------|------|------------------------|----------------------|------------------|-----------------|------|------|------|------|------|------|--|----|----|----|----|------------------------|----------------------|
| Implementation and Delivery                      | <p><b>Targeted Dispatch</b> (One to eight DR events per summer)</p> <p>The estimated performance for Targeted Dispatch is lower than expected given the number of enrollments. Consequently, the Company proposed increasing the goal to 28MW-performed for 2022.</p> <p>The number of enrolled MW in Targeted Dispatch has decreased since 2019. This is in large part due to customers choosing to move their enrollment from Targeted Dispatch to Daily Dispatch. This is a good trend, because Daily Dispatch generates more system benefits per MW than Targeted Dispatch offering.</p> <p><i>Table 6. Targeted Dispatch Participation</i></p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="4">Historic Numbers</th> <th>Estimated Number</th> <th>Proposed Number</th> </tr> <tr> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td><b>Average MW of Curtailment over all events</b></td> <td>11</td> <td>27</td> <td>32</td> <td>21</td> <td>23<br/>(vs. 37 planned)</td> <td>28<br/>(20% increase)</td> </tr> </tbody> </table> <p>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.</p> |      | Historic Numbers |      |                        |                      | Estimated Number | Proposed Number | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | <b>Average MW of Curtailment over all events</b> | 11 | 27 | 32 | 21 | 23<br>(vs. 37 planned) | 28<br>(20% increase) |
|  | Historic Numbers  |      |                  |      | Estimated Number       | Proposed Number      |                  |                 |      |      |      |      |      |      |  |    |    |    |    |                        |                      |
|  | 2017  | 2018 | 2019             | 2020 | 2021                   | 2022                 |                  |                 |      |      |      |      |      |      |  |    |    |    |    |                        |                      |
| <b>Average MW of Curtailment over all events</b> | 11  | 27   | 32               | 21   | 23<br>(vs. 37 planned) | 28<br>(20% increase) |                  |                 |      |      |      |      |      |      |  |    |    |    |    |                        |                      |

|  | <p>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.</p> <p><b>Daily Dispatch (40 to 60 DR events per summer)</b></p> <p>The estimated performance for Daily Dispatch is lower than expected given the number of enrollments. Consequently, the Company proposed increasing the goal to 10 MW-performed for 2022.</p> <p><i>Table 7. Daily Dispatch Participation</i></p> <table border="1"> <thead> <tr> <th></th> <th colspan="2">Historic Numbers</th> <th>Estimated Number</th> <th>Proposed Number</th> </tr> <tr> <th></th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td><b>Average MW of Curtailment over all events</b></td> <td>0</td> <td>4</td> <td>8<br/>(vs. 4 planned)</td> <td>10<br/>(25% increase)</td> </tr> </tbody> </table> <p>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.</p> <p>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.</p> |      | Historic Numbers     |                      | Estimated Number | Proposed Number |  | 2019 | 2020 | 2021 | 2022 | <b>Average MW of Curtailment over all events</b> | 0 | 4 | 8<br>(vs. 4 planned) | 10<br>(25% increase) |
|--|---|------|----------------------|----------------------|------------------|-----------------|--|------|------|------|------|--|---|---|----------------------|----------------------|
|  | Historic Numbers  |      | Estimated Number     | Proposed Number      |                  |                 |  |      |      |      |      |  |   |   |                      |                      |
|  | 2019  | 2020 | 2021                 | 2022                 |                  |                 |  |      |      |      |      |  |   |   |                      |                      |
| <b>Average MW of Curtailment over all events</b> | 0   | 4    | 8<br>(vs. 4 planned) | 10<br>(25% increase) |                  |                 |  |      |      |      |      |  |   |   |                      |                      |
| Customer Feedback                                | Although COVID-19 will have lasting impacts on how customers do business, most customers are expecting relatively normal operations for the summer of 2021.   |      |                      |                      |                  |                 |  |      |      |      |      |  |   |   |                      |                      |
| Changes for 2022                                 | At this time, there are no anticipated program changes related to Targeted or Daily Dispatch for 2022 based on performance projections from currently available data. The results from the summer 2021 performance may highlight opportunities to improve the program in 2022, 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.   |      |                      |                      |                  |                 |  |      |      |      |      |  |   |   |                      |                      |

|                       |  |
|-----------------------|--|
|                       | <p><b>Coordination with other Company Energy Storage programs</b></p> <p>The Company is supporting an OER-led Department of Energy (DOE) grant for the field validation of an Integrated Refrigeration Energy Management (REM) technology for controls, active demand response, and continuous commissioning in grocery stores. The objectives supported by the DOE grant are to recruit grocery stores to participate in ConnectedSolutions offerings using refrigeration systems yielding flexible active demand reduction and demonstrate revenue and/or operational savings for grocery customers.</p> |
| Rationale for Changes | <p>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.</p>   |

**Commercial ConnectedSolutions – Electric Program Goals, Metrics, Budgets, Participation for 2022**

| Fuel     | Lifetime MWh (Electric) | Annual MWh (Electric) | Annual Active Demand Reduction kW (Electric) | Budget (\$000) | Participation |
|----------|-------------------------|-----------------------|--|----------------|---------------|
| Electric | 0                       | 0                     | 32,400                                       | 4,386.0        | 180           |

**9. C&I Multifamily Program**

|                      |  |
|----------------------|--|
| Eligibility Criteria | <p>See Attachment 1, Section 3, for eligibility information.</p> <p>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&amp;I program also serves customers like non-profits, group homes, and houses of worship that traditionally do not fit within the predefined program structure.</p> |
| Offerings            | <p>See Attachment 1, Section 3, for offerings.</p> <p>In addition to what is listed in Attachment 1, Section 3, the C&amp;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</p>   |

|                               |   |
|-------------------------------|---|
|                               | 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.<br>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 2022              | 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 2022**

|     | Lifetime MMBtu (Gas) | Annual MMBtu (Gas) | Budget (\$000) | Participation |
|-----|----------------------|--------------------|----------------|---------------|
| Gas | 131,220              | 8,803              | 957            | 729           |

## 10. Finance as an Enabling Strategy

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.

10.1. 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 SEMP's)  |
| 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 2022 are illustrated in Attachment 5, Table E-10.   |
| Relevant notes       | The Company is requesting a \$2,000,000 infusion into this revolving loan fund as the Company is projecting a negative balance in this fund by the end of 2022. This includes estimated repayments made by customers in 2022. |

10.2. 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 most recent Small Business revolving loan fund projections are illustrated in Attachment 5, Table E-10.   |



10.3. On Bill Repayment (OBR) – Gas

|                      |   |
|----------------------|---|
| Customer type        | All commercial gas customers  |
| Max loan size        | \$1,000 to ~\$100,000 (may be larger for SEMP's 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 most recent Gas revolving loan fund projections for 2021 are illustrated in Attachment 6, Table E-10.   |
| Notes                |   |

10.4. 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, over \$60MM in loans closed 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 program can be found at the RI Infrastructure Bank webpage ( <a href="https://www.riib.org/ebf">https://www.riib.org/ebf</a> ) and the RI Office of Energy Resources webpage ( <a href="http://www.energy.ri.gov/RIEBF/">http://www.energy.ri.gov/RIEBF/</a> )  |
| Description          | The Efficient Buildings Fund (EBF) is a long-term, below-market financing option for municipalities and quasi-public agencies to complete energy efficiency and renewable energy projects. EBF is administered in partnership with RI Office of Energy Resources (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. |

|              |   |
|--------------|---|
| 2022 Actions | The Infrastructure Bank and OER will administer the program and National Grid will continue to provide technical, logistical, incentive support to municipal customers. |
| Notes        |   |

#### 10.5. 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-9.

#### 10.6. 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+   |

#### 10.7. 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        |

## 11. Other Enabling Strategies for Customer Engagement

### 11.1. 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.

### 11.2. 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:

#### 11.2.1. 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.

#### 11.2.2. 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.

### 11.3. Enabling Technologies

#### 11.3.1. 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<sup>o</sup> F to 145<sup>o</sup> 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.

#### 11.3.2. 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.

#### 11.3.3. Cozy™ 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%.<sup>9</sup> Non-energy benefits include increased asset value, improved tenant/occupant

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<sup>9</sup> <https://www.radiatorlabs.com/wp-content/uploads/2016/08/CaseStudy-ColumbiaUniversity.pdf>

comfort, reduced emissions, and improved safety. One college in Rhode Island has had good results. This measure is available as a custom project.

#### 11.3.4. 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.

## 12. Marketing to Commercial and Industrial Customers

In the first half of 2021, the Company continued the “Open Up to New Possibilities” campaign, which launched in July of 2020 after a brief Marketing pause and as a response to the current situation for many businesses because of the Covid-19 pandemic. As businesses were still feeling the impacts of COVID, the strategy was to continue to relate to and understand what business customers are going through as they are navigating their new normal and plans for re-opening. 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).

Figure 8. Open Up to New Possibilities Campaign Images

**Refresh. Refocus. Reimagine.**  
Move forward and bring a healthier business with you. We can help.  
We know your business may look a little different now. That's why National Grid has new ways of thinking that support new ways of doing business. When the time is right for you, let's partner together to reevaluate your safety and refresh your spaces with an energy-efficiency plan tailored to your specific needs. Together we can create more comfort and confidence with relevant energy solutions you can rely on.

When you're ready, let's talk. Our door is always open.

Air quality improvements Heating and cooling loads LED lighting solutions

Open up to new possibilities at [ngrid.com/biz](http://ngrid.com/biz) or call 800-332-3333.

**nationalgrid**

**nationalgrid**

**Achieve five stars for guest and staff confidence.**

See how energy efficiency can help improve your business

Attract and retain loyal guests and staff members by making your hotel safer, healthier and more comfortable. We can help with cost-effective strategies for improving air quality, airflow, ventilation and more throughout your property. When you're ready, let's talk about using energy to elevate guest and staff experiences, all while accommodating your budget.\*

**HVAC**  
Minor upgrades can help meet new requirements for air quality.

**System Optimization**  
Air balancing, circulating fans and other low-cost enhancements will improve comfort.

**Air Sealing**  
Improved insulation can keep clean air in and dangerous airborne pathogens out.

**OPEN UP TO NEW POSSIBILITIES**

\*In-person and virtual walk-throughs of your facility are available.

In the second half of 2021, with businesses more focused on re-opening as a natural evolution to the “Open up to new possibilities” campaign, the Company launched “More Opportunities in More Places.” This campaign is anticipated to continue in 2022. The theme is focused on the idea that after nearly a full year of just trying to stay in business, we want to help you get back to business with the resources, financing and expertise you need.



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 any campaign, National Grid surveys our Business Customer Council and utilizes the insights from 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. 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  |
|--|--|--|
| <ul style="list-style-type: none"> <li>• Smallest customers based on usage</li> <li>• Most environmentally conscious, interested in green-related products</li> <li>• Among the most open to purchasing from NG</li> </ul> | <ul style="list-style-type: none"> <li>• Small customers</li> <li>• Interested in tools to manage accounts</li> <li>• Skew to Real Estate</li> <li>• The least open to purchasing from NG</li> </ul> | <ul style="list-style-type: none"> <li>• Medium customers</li> <li>• Interested in bill and usage information, financing options</li> <li>• Skews to Retail/Food</li> <li>• The most open to purchasing from NG</li> </ul> |

| No Frills  | ★ Big Business  |
|--|---|
| <ul style="list-style-type: none"> <li>• Medium customers</li> <li>• Most interested in the basics of customer service and emergency response</li> <li>• Among least open to purchasing from NG</li> </ul> | <ul style="list-style-type: none"> <li>• Largest customers</li> <li>• More interested in advice, tools to track usage and savings</li> <li>• Lowest level of barriers to energy improvements</li> <li>• Skews to Industrial, Public Sector</li> </ul> |

As National Grid develops 2022 campaign plans, paying close attention to the appropriate messaging and tone as business customers recover from the pandemic, 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 “More Opportunities in More Places” campaign will serve as an overarching campaign that provides a unified message for large commercial customers, small business customers and multifamily customers. In 2022, 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 2022, the Company will continue to leverage earned media/PR as a truly integrated part of our marketing campaign, an initiative that kicked off in 2019 (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 all 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 re-tenant 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 2022, the Company will continue to focus on the key strategies that have proven successful in the past. It 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.

Finally, the Company will tie its marketing activities to the energy efficiency program priorities described elsewhere in this plan. This includes:

- Promoting planned Workforce Development activities, potentially via social media.
- Developing fact sheets to explain program focus areas such as ESPO.
- Developing case studies demonstrating successful efficiency projects highlighting specific sectors, namely for lodging and commercial real estate customers. This builds on a 2021 effort to produce a series of case studies on projects completed at the Quonset business park.

### 13. Commercial and Industrial Measures and Incentives

Table 8. Electric Programs

| Electric Programs                                |  |                                      |                            |                  |              |             |
|--|--|--------------------------------------|----------------------------|------------------|--------------|-------------|
| Program  | Subprogram                             | Net Annual kWh Tracker by Subprogram | Incentive / Net Annual kwh | Total Incentives | Shared Costs |             |
| Large Commercial and Industrial New Construction | D2 CAIR                                | 272,520                              | \$0.22                     | \$60,000         |              |             |
|  | C&I Codes                              | 274,550                              | \$0.00                     | \$0              |              |             |
|  | D2 Upstream Food Service               | 605,600                              | \$0.66                     | \$400,000        |              |             |
|  | D2 HVAC Prescriptive                   | 596,266                              | \$0.28                     | \$167,900        |              |             |
|  | Upstream Heat Pump - Ductless          | 75,053                               | \$1.11                     | \$83,189         |              |             |
|  | Upstream Heat Pump - Packaged          | 104,240                              | \$1.73                     | \$180,502        |              |             |
|  | Upstream HVAC Air Conditioners         | 823,994                              | \$0.39                     | \$319,585        |              |             |
|  | Upstream HVAC Controls                 | 40,992                               | \$0.16                     | \$6,413          |              |             |
|  | Upstream HVAC ECM Pump                 | 40,992                               | \$0.45                     | \$18,374         |              |             |
|  | Upstream HVAC VRF                      | 278,606                              | \$0.87                     | \$241,937        |              |             |
|  | D2 Lights                              | 2,439,962                            | \$0.27                     | \$663,000        |              |             |
|  | Motors and VFD                         | 124,527                              | \$0.35                     | \$43,750         |              |             |
|  | Upstream HVAC Refrigeration            | 8,935                                | \$1.17                     | \$10,450         |              |             |
|  | Comprehensive Design - Custom          | 527,245                              | \$1.06                     | \$559,550        |              |             |
|  | Compressed Air - Custom                | 1,225,921                            | \$0.55                     | \$678,930        |              |             |
|  | HVAC - Custom                          | 2,937,300                            | \$0.75                     | \$2,200,845      |              |             |
|  | Lighting - Custom                      | 397,198                              | \$0.42                     | \$165,000        |              |             |
|  | Motors & VFD - Custom                  | 247,873                              | \$0.31                     | \$76,713         |              |             |
|  | Process - Custom                       | 1,127,686                            | \$0.46                     | \$514,315        |              |             |
|  | Refrigeration - Custom                 | 323,054                              | \$0.62                     | \$199,959        |              |             |
|  | Other - Custom                         | 116,277                              | \$0.55                     | \$64,396         |              |             |
|  | Program Planning & Administration      |                                      |                            |                  |              | \$291,923   |
|  | Marketing                              |                                      |                            |                  |              | \$306,751   |
|  | Sales, Technical Assistance & Training |                                      |                            |                  |              | \$1,546,086 |
|  | Evaluation & Market Research           |                                      |                            |                  |              | \$432,863   |

| Electric Programs                        |  |  |                            |                  |              |           |
|--|--|--|----------------------------|------------------|--------------|-----------|
| Program                                  | Subprogram                                   | Net Annual kWh Tracker by Subprogram   | Incentive / Net Annual kwh | Total Incentives | Shared Costs |           |
| Large Commercial and Industrial Retrofit | CHP  | -                                      | -                          |                  |              |           |
|  | Custom: SEM                                  | 459,260                                | \$0.03                     | \$13,778         |              |           |
|  | El HVAC                                      | 1,144,586                              | \$0.37                     | \$426,419        |              |           |
|  | Custom: Street Lighting                      | 717,503                                | \$0.34                     | \$241,500        |              |           |
|  | El Light: Prescriptive                       | 17,181,203                             | \$0.43                     | \$7,354,458      |              |           |
|  | El Light: Upstream A-lines and Decoratives   | 340,875                                | \$0.15                     | \$49,500         |              |           |
|  | El Light: Upstream Exterior                  | 403,750                                | \$0.71                     | \$287,500        |              |           |
|  | El Light: Upstream G24 G23, MR Lamps, PAR    | 204,525                                | \$0.44                     | \$90,000         |              |           |
|  | El Light: Upstream High/Low Bay              | 3,962,560                              | \$0.20                     | \$805,000        |              |           |
|  | El Light: Upstream Linear Fixture w/Controls | 794,682                                | \$1.28                     | \$1,020,000      |              |           |
|  | El Light: Upstream Linear Luminaires         | 861,520                                | \$0.57                     | \$488,400        |              |           |
|  | El Light: Upstream Retrofit Kits             | 739,704                                | \$0.24                     | \$178,000        |              |           |
|  | El Light: Upstream Stairwell                 | 10,562                                 | \$1.16                     | \$12,200         |              |           |
|  | El Light: Upstream TLEDs                     | 587,400                                | \$0.11                     | \$63,000         |              |           |
|  | Motors and VFD                               | 2,089,620                              | \$0.37                     | \$780,000        |              |           |
|  | Compressed Air - Custom                      | 513,284                                | \$0.25                     | \$125,806        |              |           |
|  | HVAC - Custom                                | 2,016,016                              | \$0.87                     | \$1,748,450      |              |           |
|  | Lighting - Custom                            | 7,865,709                              | \$0.50                     | \$3,908,170      |              |           |
|  | Motors & VFD - Custom                        | 184,651                                | \$0.53                     | \$97,479         |              |           |
|  | Process - Custom                             | 425,109                                | \$0.40                     | \$168,314        |              |           |
|  | Refrigeration - Custom                       | 527,918                                | \$0.83                     | \$437,946        |              |           |
|  | Other - Custom                               | 101,518                                | \$0.57                     | \$57,420         |              |           |
|  | Program Planning & Administration            |  |                            |                  | \$732,937    |           |
|  | Marketing                                    |  |                            |                  | \$239,517    |           |
|  | Sales, Technical Assistance & Training       |  |                            |                  | \$4,814,148  |           |
|  | Evaluation & Market Research                 |  |                            |                  | \$816,261    |           |
| Small Business Direct Install            | Lighting                                     | 8,305,575                              | \$0.76                     | \$6,343,353      |              |           |
|  | Lighting controls                            | 762,234                                | \$1.28                     | \$974,586        |              |           |
|  | Non-Lighting                                 | 907,885                                | \$0.68                     | \$619,239        |              |           |
|  |  | Program Planning & Administration      |                            |                  |              | \$226,132 |
|  |  | Marketing                              |                            |                  |              | \$244,014 |
|  |  | Sales, Technical Assistance & Training |                            |                  |              | \$306,009 |
|  |  | Evaluation & Market Research           |                            |                  |              | \$256,040 |

| Program                        | Subprogram           | Demand Response kW Goal | Incentive / Net Annual kW | Total Incentives | Shared Costs |
|--------------------------------|----------------------|-------------------------|---------------------------|------------------|--------------|
| Commercial Connected Solutions | Daily DR Resources   | -                       | -                         |                  |              |
|                                | Peak Shaving DR (MW) | 459,260                 | \$0.03                    | \$13,778         |              |
|                                |                      | 1,144,586               | \$0.37                    | \$426,419        |              |
|                                |                      | 717,503                 | \$0.34                    | \$241,500        |              |
|                                |                      | 17,181,203              | \$0.43                    | \$7,354,458      |              |
|                                |                      | 340,875                 | \$0.15                    | \$49,500         |              |

Commercial and Industrial Measures and Incentives

Table 9. Natural Gas Programs

| Gas Programs   |  |   |   |                       |              |
|--|--|---|---|-----------------------|--------------|
| Program  | Measure Groups                               | Net Annual<br>MMBtu<br>Tracker by<br>Subprogram | Incentive<br>/ Net<br>Annual<br>MMBtu     | Total<br>Incentives   | Shared Costs |
| Large Commercial and<br>Industrial New<br>Construction | Boilers                                      | 2,859   | \$71                                      | \$203,406             |              |
|  | CODES AND STANDARDS                          | 358   | \$0                                       | \$0                   |              |
|  | Combo Boiler/DHW                             | 864   | \$135                                     | \$116,670             |              |
|  | Non Boiler Heating                           | 529   | \$72                                      | \$38,270              |              |
|  | COND WATER HEATER 94%MIN 75-300<br>and above | 575   | \$76                                      | \$43,607              |              |
|  | COOKING-COMBO OVEN 1                         |   |   |                       |              |
|  | COOKING-CONVECTION OVEN 1                    |   |   |                       |              |
|  | COOKING-CONVEYOR OVEN 1                      |   |   |                       |              |
|  | COOKING-FRYER-1000                           |   |   |                       |              |
|  | COOKING-COMBO OVEN 1 - Upstream              | 610   | \$17                                      | \$10,589              |              |
|  | COOKING-CONVECTION OVEN 1-<br>Upstream       | 1,658   | \$42                                      | \$69,092              |              |
|  | COOKING-CONVEYOR OVEN 1-Upstream             | 244   | \$17                                      | \$4,243               |              |
|  | COOKING-FRYER-1000- Upstream                 | 13,676  | \$24                                      | \$332,412             |              |
|  | COOKING-GRIDDLE 1- Upstream                  | 105   | \$17                                      | \$1,819               |              |
|  | COOKING-RACK OVEN 1-Upstream                 | 1,753   | \$17                                      | \$30,427              |              |
|  | COOKING-STEAMER-1000- Upstream               | 387   | \$17                                      | \$6,726               |              |
|  | WATER HEATER - Indirect Upstream             | 82  | \$44                                      | \$3,648               |              |
|  | Water Heaters 94 and above<br>Custom         | 435<br>25,557                                   | \$57<br>\$25                              | \$24,724<br>\$650,997 |              |
|  | Water Heating Boiler - 94% TE                | 3,263   | Up to 75%<br>of Total<br>Resource<br>Cost | \$59,330              |              |
|  | Program Planning & Administration            |   |   |                       | \$118,453    |
| Marketing  |  |   |   | \$152,115             |              |
| Sales, Technical Assistance & Training                 |  |   |   | \$1,063,545           |              |
| Evaluation & Market Research                           |  |   |   | \$216,512             |              |
| Large Commercial and<br>Industrial Retrofit            | Controls                                     | 18,868  | \$20                                      | \$381,524             |              |
|  | Custom: RCx                                  | 3,962   | \$16                                      | \$63,000              |              |
|  | Behavior / Training                          | 2,778   | \$0                                       | \$0                   |              |
|  | DHW  | 667   | \$15                                      | \$9,706               |              |
|  | HVAC   | 17,224  | \$17                                      | \$296,193             |              |
|  | Prescriptive Steam Traps                     | 9,652   | \$10                                      | \$93,149              |              |
|  | Custom: General                              | 81,123  | \$17                                      | \$1,385,555           |              |
|  | Custom: SEM                                  | 4,133   | \$30                                      | \$124,051             |              |
|  | Program Planning & Administration            |   |   |                       | \$199,241    |
|  | Marketing                                    |   |   |                       | \$334,243    |
| Sales, Technical Assistance & Training                 |  |   |   | \$1,590,552           |              |
| Evaluation & Market Research                           |  |   |   | \$165,605             |              |

| 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          |              |



# 2022 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 interim work products and 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 2021**

The Company, with input from EERMC and OER, expects to complete 8 Rhode Island-specific evaluation studies in 2021 (see below). The research studies include impact evaluations, process evaluation, 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-CE-UpstrLight - Impact Evaluation of PY2019 Upstream Lighting Program
2. RI-20-CG-CustGasPY19 - Impact Evaluation of PY2019 Custom Gas Installations
3. RI-19-CE-CustElec - Impact Evaluation of PY2018 Custom Electric Installations
4. RI-20-CE-CustElecPY19 - Impact Evaluation of PY2019 Custom Electric Installations

### **Residential**

1. RI-19-RE-HEM - Residential Home Energy Monitoring (Sense) Demonstration Process Evaluation
2. RI-21-RE-AppRecycling - Appliance Recycling Impact Factor Update

### **Cross-Cutting**

1. RI-20-XG-GasPeak - Gas Peak Demand Savings
2. RI-21-XX-Jobs - Workforce Associated with Rhode Island Energy Efficiency Programs Analysis Study

### 3. RI-19-XE-Rhode Island Strategic Electrification Study

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 2022 program planning due to similarity, either in the measures offered, or program structure or delivery.

In addition to the studies listed above, the OER hired an energy consulting firm 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.<sup>1</sup> This study and the Company's response to its recommendations are discussed in Section 6.

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 been superseded by studies completed since the filing of the 2021 Energy Efficiency Plan have been removed from this list. These studies are available through the request of the EERMC<sup>2</sup>, the Rhode Island Public Utilities Commission (PUC)<sup>3</sup>, and National Grid.

## 3. 2022 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. 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 Mass Save Program Administrators when possible. 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. A protocol for these efforts will be developed in 2022, with the goal of continuing and improving upon the benefits of this relationship.

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<sup>1</sup> <http://webserver.rilin.state.ri.us/PublicLaws/law18/law18079.htm>

<sup>2</sup> <https://rieermc.ri.gov/plans-reports/evaluation-studies/>

<sup>3</sup> <http://www.ripuc.org/>

Table 2 lists evaluation studies that the Company plans to conduct in 2022 to inform the 2023 Annual Plan and future planning cycles. Barring changes to the 2023 Annual Plan schedule, studies that will be incorporated into the Annual Plan must be completed by August 2022. 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<br>20<br>21         | R = residential<br>C = commercial<br>X = cross sector | E = electric<br>G = gas<br>X = electric & gas |           |

**Table 2. Planned Evaluation Studies in 2022**

| Sector | Study Code            | Type    | Affected Programs | Study Name  | State Lead |
|--------|-----------------------|---------|-------------------|---|------------|
| C&I    | RI-21-CG-CustGasPY20  | Impact  | C&I Gas           | Impact Evaluation of PY2020 Custom Gas Installations (continued from 2021)      | RI         |
| C&I    | RI-21-CE-CustElecPY20 | Impact  | C&I Elec          | Impact Evaluation of PY2020 Custom Electric Installations (continued from 2021) | RI         |
| C&I    | RI-22-CG-CustGasPY21  | Impact  | C&I Gas           | Impact Evaluation of PY2021 Custom Gas Installations                            | RI         |
| C&I    | RI-22-CE-CustElecPY21 | Impact  | C&I Elec          | Impact Evaluation of PY2021 Custom Electric Installations                       | RI         |
| C&I    | RI-22-CX-FRSO         | NTG     | C&I               | C&I Free-Ridership and Spillover Study  | RI         |
| C&I    | RI-22-CX-Proc         | Process | C&I               | Small Business Process Evaluation   | RI         |
| C&I    | RI-22-CX-Codes        | Codes   | C&I               | C&I New Construction Baseline Study   | RI         |

|               |                        |        |                             |   |    |
|---------------|------------------------|--------|-----------------------------|---|----|
| C&I           | RI-22-CE-LightMar      | Market | C&I Electric                | C&I Lighting Market Characterization Study  | RI |
| C&I           | RI-22-CX-Presc         | Impact | C&I                         | C&I Prescriptive Non-Lighting Impact Evaluation                                       | MA |
| C&I           | RI-22-CX-RTUOpt        | Impact | C&I                         | Automated RTU Optimization Demonstration Evaluation                                   | RI |
| Residential   | RI-21-RX-NPStudy       | Market | Multiple                    | EE Non-Participant Study (continued from 2021)  | RI |
| Residential   | RI-21-RE-SolarDRDemo   | Impact | DR                          | Solar Inverter Power Factor Correction Demonstration Evaluation (continued from 2021) | RI |
| Residential   | RI-21-RG-GasHPDemo     | Impact | HVAC Demo                   | Gas Heat Pump Demonstration Evaluation  | RI |
| Residential   | RI-21-RX-CSNC          | Impact | RNC/Codes                   | Residential New Construction and Code Compliance Study (continued from 2021)          | RI |
| Residential   | RI-22-RX-SecondaryHeat | Impact | EWSF                        | Follow-up Research on Secondary Heating in EnergyWise Single Family Program           | RI |
| Residential   | RI-22-RE-HPMeter       | Impact | Energy Star HVAC - Electric | Mini-Split/Central Heat Pump Metering Study   | MA |
| Residential   | RI-22-RX-ModerateNEI   | NEI    | EWSF                        | Moderate Income NEI study   | MA |
| Cross-cutting | RI-22-XX-Workforce     | Policy | Multiple                    | Workforce Associated with Rhode Island Energy Efficiency Programs Analysis Study      | RI |
| Cross-cutting | RI-22-XX-WorkDev       | Policy | Multiple                    | Rhode Island Energy Efficiency Workforce Development Needs Assessment                 | 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 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 2022 is approximately \$2.8 million (\$2.1 million for electric and \$0.7 million for gas), excluding internal staffing costs. The proposed budget for EM&V comprises approximately 1.8% of the total portfolio budget in 2022.

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.<sup>4</sup>

There were several additional studies that were discussed for inclusion in the 2022 Plan. A list of these studies is shown below.

- Impact Evaluation of Income Eligible Services Program.
- Process Evaluation of Home Energy Reports Program.
- Residential Appliance Saturation Survey.
- REMI Analysis.

These four studies were discussed with OER and the EERMC Consultants and considered for inclusion in the 2022 annual plan. These impact evaluation studies are intentionally being delayed in the 2022 plan to avoid spurious/not applicable effects caused by the pandemic. The Company will continue to discuss and consider these plans for inclusion in the 2023 plan. Some specific study reasons are included below.

For Home Energy Report, the program delivery may change since it will be out to bid. Due to this, it was decided that it would be more appropriate to wait for this vendor to be selected before evaluating.

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<sup>4</sup> <https://rieermc.ri.gov/plans-reports/evaluation-studies/>

For the Residential Appliance Saturation Survey, the study will not be needed in 2022 because there will not be a full-blown Technical Potential Study in 2022.

### **3.1 Commercial and Industrial Planned Evaluation Studies in 2022**

#### **a. RI-21-CG-CustGasPY20 – Impact Evaluation of PY2020 Custom Gas Installations (continued from 2021)**

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.

#### **b. RI-21-CE-CustElecPY20 – Impact Evaluation of PY2020 Custom Electric Installations (continued from 2021)**

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of 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.

#### **c. RI-22-CG-CustGasPY21 – Impact Evaluation of PY2021 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 2021. 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 2022 and continue into 2023.

**d. RI-22-CE-CustElecPY21 – Impact Evaluation of PY2021 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 2022.

**e. RI-22-CX-FRSO – C&I Free-Ridership and Spillover Study**

C&I free-ridership and spillover values will be updated based on an assessment of the behavior of both participants and nonparticipants of C&I energy efficiency programs. The results will assist in quantifying 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. The study will begin in late 2022 and continue into 2023.

**f. RI-22-CX-Proc – Small Business Process Evaluation**

The objective of this study is to assess the overall delivery of the Small Business Direct Install program. The study will assess the effectiveness of program delivery procedures. This evaluation will identify practical approaches to improve the overall effectiveness of the program in order to reach higher participation rates and deeper savings.

**g. RI-22-CX-Codes – C&I New Construction Baseline Study**

The objective of this study is to gather market data on new construction practices in Rhode Island. This data will be used to inform industry standard practice development and/or adoption, develop new construction baselines, and potentially to determine savings resulting from code compliance efforts. This study will be discussed in further detail in the second draft.

**h. RI-21-CE-LightMar – C&I Lighting Market Characterization Study (continued from 2021)**

The primary objective of this study is to calculate the adjusted measure lives (AML) for C&I custom and prescriptive lighting measures. To understand the future baselines needed to calculate the AMLs, this study will convert an existing stock turnover model, utilized in



Massachusetts and Connecticut, with Rhode Island specific inputs. The model will be calibrated using annual market share (% of sales) estimates. Rather than collecting primary sales data from distributors, this study will seek to collect primary interviews and/or convene a consensus group to determine market share estimates in Rhode Island. If using the consensus group approach, the study team will provide the consensus group with recent market share estimates and demographic data from Massachusetts and Connecticut to inform the discussion. In addition to producing future baselines for AMLs, the model results will help the study team understand the current and historical Rhode Island lighting saturation by submarket and technology, forecast the Rhode Island C&I lighting market trajectory, and estimate the remaining opportunities to generate program savings.

**i. RI-22-CX-Presc – C&I Prescriptive Non-Lighting Impact Evaluation**

The objective of this impact evaluation is to provide verification or re-estimation of electric energy and demand and/or natural gas savings estimates for a subset of prescriptive projects through site-specific inspection, monitoring, and analysis. The results of this study will be used to determine new deemed savings values and/or savings parameters for selected prescriptive energy efficiency offerings. The specific measures to include in this study are still to be determined and will follow the lead of the Massachusetts Program Administrators, per Piggybacking Study guidance.

**j. RI-22-CX-RTUOpt – Automated RTU Optimization Demonstration Evaluation**

The objective of this demonstration project is to verify savings for the automated RTU optimization product described in Attachment 8, section 4.2. The demonstration will install new smart thermostats and provide the software integration for 10-15 sites. The evaluation will collect data provided by the software, billing data, and potentially on-site metering for an independent assessment of the savings above and beyond the thermostat savings. The results of the study will be used to develop deemed savings, if possible. This study will kick off in spring 2022 and expected to conclude in 2023 to allow for assessment of heating savings.

### **3.2 Residential Planned Evaluation Studies in 2022**

**a. RI-21-RX-NPStudy – Non-Participant Market Barrier Study (continued from 2021)**

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<sup>5</sup> recently conducted in Massachusetts.

**b. RI-21-RE-SolarDRDemo – Solar Inverter Power Factor Correction Demonstration Evaluation (continued from 2021)**

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 real 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.

**c. RI-21-RG-GasHPDemo – Gas Heat Pump Demonstration Evaluation (moved to 2022)**

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 efficiently these units work at different temperatures, do they perform close to their rated efficiency and can they be the sole heating source of a home.

**d. RI-21-RX-CSNC - Residential New Construction Baseline and Code Compliance Study (continued from 2021)**

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.

**e. RI-22-RX-SecondaryHeat – Follow-up Research on Secondary Heating in EnergyWise Single Family Program**

This follow-up study aims to explore the potential impact of secondary heat sources on evaluated savings in the EnergyWise Single Family Program. This study may include literature review, analysis of program data and participant surveys to understand the prevalence of secondary heating in participating homes and to assess any impacts that may not be accounted for in the previous EnergyWise impact evaluation.

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<sup>5</sup> [http://ma-eeac.org/wordpress/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy\\_Final.pdf](http://ma-eeac.org/wordpress/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf)

**f. RI-22-RE-HPMeter – Mini-Split/Central Heat Pump Metering Study**

The goals for this study would be to update the savings estimates for the current rebate offerings for heat pumps. The study would include detailed metering of participating customers in order to update results that are currently over 5 years old. This study would be in collaboration with MA and possible other states in the New England area. The study goal would be looking to update the savings for mini-split heat pumps, both going from standard heat pumps to high efficiency heat pumps and electric resistance to heat pumps, and ducted heat pumps going from standard heat pumps to high efficiency heat pumps in RI

**g. RI-22-RX-ModerateNEI – Moderate Income NEI Study**

The objective of this study is to quantify non energy impacts related to weatherization that may apply to moderate income customer group. This study will involve a literature review of NEI studies for moderate income offering and an analysis of NEI among program participants and non-participants if unable to derive NEIs from the literature review. This study will be in collaboration with MA.

### **3.3 Cross-Sector/Other Planned Evaluation Studies in 2022**

**a. RI-22-XX-Workforce – 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 2020, 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 2021. 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.

**b. RI-22-XX-WorkDev – Rhode Island Energy Efficiency Workforce Development Needs Assessment**

The objective of the report is to inform the Company on where to direct future workforce development investments that will prepare the present and future labor pool to reach the state’s energy efficiency goals. Specifically, the report will: identify energy efficiency employer needs; identify certification requirements for different energy efficiency job markets; develop an inventory of energy efficiency training programs across the state; survey primary energy efficiency job types for education and training, career satisfaction and advancement, possible barriers to advancement, typical feeder and promotion occupations and, compensation and

employment benefits; understand the preferences and priorities for the pipeline of potential workers; and, examine diversity in the energy efficiency workforce and how to expand diversity across energy efficiency occupations. The data, key findings, and recommendations in this report will be based on a combination of data from surveys of energy efficiency employers, the current energy efficiency workforce, and the potential energy efficiency talent pipeline, as well as other public data.

## 4. Evaluation Study Findings

### Impact Evaluation of PY2019 Rhode Island C&I Upstream Lighting Initiative

**Type of Study:** Impact

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** 7/15/21

#### **Evaluation Objective and High-Level Findings:**

DNV carried out the Impact Evaluation of the Project Year 2019 Rhode Island C&I Upstream Lighting Initiative for National Grid from December 2020 to June 2021. The study’s overall purpose was to build on prior research to understand the extent to which program performance is meeting program and policy goals and objectives.

The study was designed to answer the following research questions in three categories:

#### **Baseline information:**

- Was the site new construction or a major renovation event?
- What type, wattage, and count of lamps/fixtures were replaced by measures supported by the initiative? This question includes the proportion of T12 systems or lamps replaced by program measures

#### **Savings factor results and their application:**

- What are the updated savings factors for National Grid to use prospectively?
- How much savings can be attributed to controls induced by the initiative?
- How has the quantity of light fixtures/lamps increased or decreased since participating in the program? For example, where TLEDs were installed, were extra linear T8s installed to make up for the less than expected light output?
- Update the building type HOU values

#### **Programs to which the Results of the Study Apply:**

The results of this study are applicable to the Upstream Lighting measures alone.

#### **Evaluation Recommendations included in the Study:**

The study team proposed updated ISR, and kW saved per unit. When applied and combined with existing and unchanging HVAC interactive effects, and Delta Watts adjustment factors, the new RR values are show in the following table:

| Category                | kWh RR | Summer kW RR | Winter kW RR | Non Electric RR |
|-------------------------|--------|--------------|--------------|-----------------|
| Screw-In LEDs           | 50.47% | 57.82%       | 46.06%       | 50.47%          |
| LED Stairwell Kits      | 86.00% | 86.00%       | 86.00%       | 86.00%          |
| Linear LEDs             | 97.92% | 110.40%      | 95.04%       | 97.92%          |
| Linear LEDs w/ Controls | 98.94% | 111.55%      | 96.03%       | 98.94%          |

|                                       |        |         |        |        |
|---------------------------------------|--------|---------|--------|--------|
| <b>Linear Fixtures LEDs</b>           | 99.96% | 112.70% | 97.02% | 99.96% |
| <b>Linear Fixture LEDs w Controls</b> | 99.96% | 112.70% | 97.02% | 99.96% |
| <b>High Bay / Low Bay</b>             | 92.82% | 104.65% | 90.09% | 92.82% |
| <b>Exterior LEDs</b>                  | 95.00% | 95.00%  | 95.00% | 95.00% |
| <b>High Bay / Low Bay w Controls</b>  | 92.82% | 104.65% | 90.09% | 92.82% |
| <b>Exterior LEDs w Controls</b>       | 95.00% | 95.00%  | 95.00% | 95.00% |

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**  
National Grid is adopting these results.

**Savings Impact:**

These realization rates are broadly an increase across all categories, hold screw-in lighting applications.

**RI-19-CE-CustElec and RI-20-CE-CustElecPY19 - Impact Evaluation of PY2018 and PY2019**

**Custom Electric Installations**

**Type of Study:** Impact

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** September 2021

**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.

| <b>Lighting</b>               | <b>PY2016</b> | <b>PY2018</b> | <b>PY 2019</b> | <b>PY2016+PY2018+PY2019</b> |
|-------------------------------|---------------|---------------|----------------|-----------------------------|
| Tracking Energy Savings (kWh) | 19,142,741    | 13,294,077    | 17,498,949     | 49,935,767                  |
| Sample Size (n)               | 3             | 10            | 10             | 23                          |
| RR                            | 99.9%         | 94.3%         | 91.4%          | 95.4%                       |
| Relative precision@ 90% CI    | ±5.6%         | ±21.7%        | ±18.4%         | ±9.2%                       |

| <b>Non-Lighting</b>           | <b>PY2016</b> | <b>PY2018</b> | <b>PY 2019</b> | <b>PY2016+PY2018+PY2019</b> |
|-------------------------------|---------------|---------------|----------------|-----------------------------|
| Tracking Energy Savings (kWh) | 21,044,847    | 12,910,679    | 12,804,067     | 46,759,593                  |
| Sample Size (n)               | 8             | 14            | 15             | 37                          |
| RR                            | 69.3%         | 77.6%         | 104.1%         | 81.1%                       |
| Relative precision@ 90% CI    | ±26.0%        | ±12.3%        | ±18.4%         | ±13.2%                      |

The PY2018 study was scheduled to be completed in 2020, but due to onsite restrictions resulting from COVID-19, onsite work did not begin until late 2020. Due to this delay, both the PY2018 and PY2019 studies were completed in 2021. As a three-year rolling scheme is used to determine custom realization rates, the overall realization rates from this study combine results from PY2016, PY2018, and PY2019 studies.

For some sites, collecting metered data was not possible due to pandemic-related changes in facility operation or site access. For these sites, assessment of non-operational factors was performed, and a historical operational adjustment factor was used to estimate the site operation.

**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 95.4% RR for lighting and 81.1% 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:**

This study will result in an increase in claimable savings from both lighting and non-lighting Large Commercial Custom Electric projects.



**RI-20-CG-CustGasPY19 - Impact Evaluation of PY2019 Custom Gas Installations**

**Type of Study:** Impact

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** September 2021

**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                       | PY2017    | PY2018    | PY2019    | PY2017+PY2018+PY2019 |
|---------------------------------|-----------|-----------|-----------|----------------------|
| Tracking Savings (therms)       | 1,948,383 | 2,350,739 | 1,944,204 | 6,243,326            |
| Sample Size                     | 6         | 6         | 10        | 22                   |
| Realization Rate (RR)           | 92.7%     | 83.3%     | 85.3%     | 86.9%                |
| Relative Precision @ 80% CI (%) | ±2.3%     | ±22.6%    | ±4.5%     | ±6.8%                |

As a three-year rolling scheme is used to determine custom realization rates, the overall realization rate from this study combines results from PY2017, PY2018, and PY2019 studies.

For some sites, collecting metered data was not possible due to pandemic-related changes in facility operation or site access. For these sites, assessment of non-operational factors was performed, and a historical operational adjustment factor was used to estimate the site operation.

**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 of 86.9% RR.

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:**

This study will result in an increase in claimable savings from Large Commercial Custom Gas projects.

**MA19C08-B-NRNCMKT - NRNC Market Characterization Study**

**Type of Study:** Market

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** June 2021

**Evaluation Objective and High-Level Findings:**

1. Assess and/or inform Industry Standard Practices (ISPs) where possible based on the data collection.
2. Assess energy code compliance for select code measures.

**Conclusions**

1. Current standard practice is better than code for many of the measures examined in this study. Clear indications of ISP were found for the following measures:
  - **Interior LPD.** The DNV team determined that interior LPD design was  $0.60 \pm 0.08$  of the code requirements (40% better than code) for buildings permitted under IECC 2015.
  - **Exterior LPD.** The DNV team examined exterior lighting design and found that standard practice for exterior lighting design was  $0.67 \pm 0.10$  of the code requirements (33% better than code) for buildings permitted under IECC 2015.
  - **Boilers.** The NRNC Study found that standard practice for boilers is to specify condensing boilers, while the code efficiency levels reflect a baseline of a non-condensing boiler. The study results suggest that the median boiler specified in NRNC are 15% better than code requirements.
  - **Heat pumps.** Standard practice was observed to be better than code, suggesting that the median ineligible specified heat pump is 3% and 6% better than code for cooling and heating respectively. Additional implementation details are beyond the scope of this study and may require further collaboration between implementers and evaluators.
  - **Warm air furnaces and direct expansion (DX) AC.** The median units for both of these equipment types were determined to be specified at code.
  - **Chillers.** The median unit was determined to be specified 1% better than code.
2. Mechanical equipment is largely compliant with the energy code efficiency requirements, though compliance is difficult to assess for mechanical equipment controls. This is consistent with prior code compliance study findings and reflects the market aligning with the code such that it is difficult to purchase equipment that does not comply with code requirements. For mechanical equipment controls, the presence of controls can be identified, but this study was not designed to provide insights regarding control commissioning or operations, key components of successful control strategies. ISPs developed from this study are based on stated equipment efficiencies from construction drawings. Actual equipment and controls performance cannot be determined from plan review and would require on-site evaluation.
3. Opportunities remain for improving code compliance and assessing building performance. While this study focused on individual measures in lieu of whole building compliance,

opportunities remain to improve compliance for select measures such as slab insulation/thermal break requirements, air barrier documentation, and daylighting. Additionally, many benefits of code compliant systems rely on proper installation of components and system commissioning, particularly for controls and envelope sealing/insulation requirements, which were not assessed as part of this study.

4. The recruitment approach in this study effectively mitigated self-selection bias and provides results reflective of the NRNC market. Prior code compliance studies likely suffered from self-selection bias in that building designers and owners who are knowingly not adhering to code could decline participation. The NRNC Study mitigated this bias by recruiting directly from municipal building departments and ensuring that sites included in the study represented a broad range of municipalities.

**Programs to which the Results of the Study Apply:**

Electric—Large Commercial New Construction

**Evaluation Recommendations included in the Study:**

1. Adopt the ISP values summarized in the table below. The product of a code adjustment factor and the code specified minimum efficiency yields the ISP baseline efficiency to be used for calculating savings. These values reflect the best available ISP data.

| Equipment Type       | Code Adj. Factor    | Notes  |
|----------------------|---------------------|--|
| Interior lighting    | 0.60                | Applicable to the IECC 2015 values   |
| Exterior lighting    | 0.67                |  |
| Hot water boilers    | 1.15                |  |
| Warm air furnaces    | 1.02                |  |
| Heat pumps – heating | 1.06                | Includes all heat pumps (air, water, and ground source) except for packaged terminal heat pumps. Applies to heat pump baselines but not fuel switch baselines. |
| Heat pumps – cooling | 1.03                | Includes all heat pumps (air, water, and ground source) except for packaged terminal heat pumps. Applies to heat pump baselines but not fuel switch baselines. |
| Air conditioning     | 1.00                | ISP is at code.  |
| Chillers             | 1% better than code | This finding will be combined with other research to determine the chiller code adjustment factor in the ISP Market Research Memo.                             |

2. Determine a chiller code adjustment factor by combining the results of this study and the concurrent chiller ISP study. The chiller ISP study collects market actor estimates of equipment market share as a different approach to determining chiller ISP. The final combined chiller code adjustment factor will be reported in the chiller ISP study.
3. Focus energy code training on targeting code provisions that are not readily complied with and/or require proper installation to capture energy benefits. This study showed that

compliance opportunities remain for building envelope components such as slab design and lighting measures such as daylighting. Additionally, many building components require proper installation to achieve benefits (e.g. envelope insulation, air barriers, mechanical and lighting controls). Focused training on these measures can improve code official and market knowledge of proper design and installation to improve compliance and building performance.

4. Account for new baselines. Other program, evaluation, and analysis methods should account for the baseline revisions, including attribution research and equipment costs used in benefit cost analysis.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

RI adopted the interior and exterior LPD ISP findings from this study. Due to code and market differences between the states, RI is not adopting any other results from this study and will conduct independent research in 2022 to investigate these issues.

**Savings Impact:**

The results of this study will result in a decrease in claimable savings for electric Large Commercial New Construction.

**MA20C03-B-EMSISP - Energy Management System ISP Study**

**Type of Study:** ISP

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** March 2021

**Evaluation Objective and High-Level Findings:**

The primary objectives of this study were to:

- Identify Industry Standard Practices (ISPs) for Energy Management Systems (EMS) systems in existing buildings including: a) How end use customers use their systems; b) whether their systems are under-utilized or in need of repair; c) Whether their systems have failed
- Use this information from primary sources (both EMS vendor/RCx provider interviews and customer site visits) to recommend: a) Criteria for distinguishing a measure event type as either replace-on failure (ROF) or early replacement (ER) b) ISPs for EMS systems in ROF scenarios c) Areas for further EMS research
- Using this primary information to recommend evidentiary standards for defining EMS systems as having failed. If possible, such standards should account for differences in the compliance capabilities of C&I customers of different sizes.
- Determining whether current Mass Save eligibility guidelines for EMS incentives are reasonable based on current standard practices; and
- Allowing the evaluation team to test the feasibility of identifying the age, condition, and operating parameters of an EMS system through both virtual and in-person site visits.

**Programs to which the Results of the Study Apply:**

Electric and Gas—Commercial and Industrial

**Evaluation Recommendations included in the Study:**

The following are the DNV team's conclusions and recommendations:

- This study supports assertions from the EMS-IWG memo that there are energy savings opportunities with existing EMS/BAS systems. Most importantly the 2020 EMS-IWG memo asserted that whole EMS system replacements, partial EMS system replacements, and component replacements should be eligible for program incentives with the baseline being the pre-existing operating condition of the EMS.
- However, challenges remain in being able to characterize the baseline operating conditions of the existing systems to support savings claims.
- Energy saving opportunities for EMS/BAS systems in new construction scenarios are limited.
- Increase customer and vendor education and support concerning ASHRAE guideline 36.
- Do more marketing of the EMS incentive program.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid is adopting the results of this study.

**Savings Impact:**

The results of this study will likely result in a net increase in claimable savings.

**MA20C07-E-DUN - Franchise Controls Deemed Savings Study**

**Type of Study:** Impact

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** March 2021

**Evaluation Objective and High-Level Findings:**

The purpose of this study was to develop measure-level deemed savings estimates for a building automation system (BAS) measure offered for small franchise coffee and donut shops, which are often installed with multiple other efficiency measures such as lighting retrofits and refrigeration controls. The measure applies time switch-based scheduling of small individual food service appliances (e.g., toasters and coffee makers), and often HVAC setback and exterior lighting controls. The study leveraged three different recent evaluation studies, where results from those studies were used as a basis to determine the optimal deemed savings estimate for the BAS measure. The recent studies include billing analysis in study P71, and impact evaluation work for PY2017 small business (MA19C03-E-SBIMPCT) and PY2017/2018 custom electric (MA19C07-E-CUSTELEC). To narrow focus on the BAS measure, DNV isolated five sites that only installed BAS systems that controlled appliances and overlapped in both the M&V and billing analysis samples.

The study provides the following key findings:

- The five sites common to the three studies have similar average impacts, at 9,651 kWh and 9,135 kWh and of the same magnitude when viewed as a percent of consumption.
- Given the DNV team’s confidence in the representativeness of the small sample, the methods to develop the measurement and verification (M&V) baseline, and that the billing analysis does not present evidence the M&V savings are incorrect, the team deemed the M&V results reasonable.
- The similarity of savings as a percent consumption between the pre-post billing analysis and M&V savings results among the overlapping subset indicates the two analyses are in agreement regarding individual site-level effects. The full billing analysis, incorporating far more sites and a comparison group, produces a result that is grounded in both more participant data and a consideration of non-program, exogenous trends. Given the parallels between the two analyses, but the ultimate overall strength of the billing analysis result, DNV recommends using the overall billing analysis study results to inform the deemed savings estimate.

**Programs to which the Results of the Study Apply:**

Electric—Large Commercial Retrofit

**Evaluation Recommendations included in the Study:**

The following recommendations were made by the evaluators conducting this study.

- Recommendation 1: Given the similarity of savings as a percent of consumption between pre-post billing analysis and M&V savings results among this subset and the

- larger billing analysis study, use the overall billing analysis study results to inform the deemed savings estimate.
- Recommendation 2: Ensure the appliances planned to be packaged into the BAS are appropriate for the control measure, rather than applying the controls to the eight greatest loads. Appliances such as ice machines, which do not benefit from controls, and appliances that were previously controlled in a similar fashion before the BAS installation should not be included in the BAS package.
  - Recommendation 3: The overall recommendation for the deemed savings estimate per BAS installed in a franchise site is 5,344 kWh, or 4.0% of site consumption.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid RI adopted the results of this study.

**Savings Impact:**

The results of this study will result in a decrease in claimable savings for electric Large Commercial Retrofit.



**MA20C15-B-GSHP - Ground Source Heat Pump eTRM Measure Review**

**Type of Study:** Technology Evaluation

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** March 2021

**Evaluation Objective and High-Level Findings:**

The purpose of this study was to determine the accuracy of the values in the Massachusetts Technical Reference Manual (eTRM) for estimating savings for ground source heat pumps (GSHP). The main objectives were to provide guidance to the PAs on possible adjustments to the eTRM savings calculations as they are presented for this measure; the need for estimating whole system savings, as opposed to savings from the heat pump unit only; and measure life estimates, including unit lifetimes vs. whole system lifetime.

The study provides the following key findings:

- The current GSHP offering is sufficient for the limited event type offering. However, it does not accurately reflect the benefits of GSHP installation for wider event types.
- GSHPs are high-performing, supplying 3.1 to 4.1 units of energy to the building as heat for every one unit of energy used to power the system.

**Programs to which the Results of the Study Apply:**

All Large Commercial and Industrial

**Evaluation Recommendations included in the Study:**

The following recommendations were made by the evaluators conducting this study:

- Recommendation 1: To more accurately reflect savings from this measure, GSHPs should be broken out from air source heat pumps (ASHPs) into their own category offering. This will allow the program to attribute savings, baselines, and lifetimes in a more defensible way.
- Recommendation 2: Baseline considerations: The measure should allow baselines to reflect pre-existing and similar code efficiencies to maximize savings for two different event types (new equipment and early replacement/retrofit).
- Recommendation 3: Algorithmic considerations: Further algorithms should be considered to include fossil fuel impacts when replacing fossil fuel-fired heating systems. When a desuperheater is included in the system, domestic hot water impacts should be included for either electric or gas dependent on the hot water heating system on-site.
- Recommendation 4: Lifetime considerations: The lifetime of the measure should be updated from 12 years to match the U.S. Department of Energy's expected lifetime of 25 years for the indoor portion of the GSHP.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid RI is adopting Recommendation 4 and is considering other recommendations.

**Savings Impact:**

Adoption of Recommendation 4 will result in an increase in claimable savings for Large Commercial and Industrial programs.

**MA20X08-B-CIHVACNTG - C&I HVAC NTG & Market Effects Measurement**

**Type of Study:** NTG

**Evaluation Conducted by:** DNV

**Date Evaluation Conducted:** June 2021

**Evaluation Objective and High-Level Findings:**

The goal of the study was to establish Net to Gross Ratios (NTGRs) for six technologies supported by the Upstream HVAC Initiative.

The recommended NTGRs are as follows:

| Technology                 | NTGR |
|----------------------------|------|
| Volume Water Heater        | 44%  |
| Instantaneous Water Heater | 38%  |
| VRF                        | 30%  |
| Package (AC, HP)           | 55%  |
| Storage Water Heater       | 29%  |
| Indirect Water Heater      | 36%  |

**Programs to which the Results of the Study Apply:**

Electric and Gas—Large Commercial New Construction

**Evaluation Recommendations included in the Study:**

The evaluation recommends adopting the NTGRs as outlined in the table above.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid is adopting the results of this study.

**Savings Impact:**

The impact of this study on claimable savings varies and is dependent on the measure type.

**RI-19-RE- HEM - Residential Home Energy Monitoring (Sense) Demonstration**

**Type of Study:** Process

**Evaluation Conducted by:** DNV GL

**Date Evaluation Conducted:** 11/19/2019

**Evaluation Objective and High-Level Findings:**

The purpose of this study was to conduct a process evaluation of National Grid’s Sense pilot program that provided residential customers with a device for their homes. This device, the Sense Monitor, connected to the customer’s circuit box, and was designed to help residential customers better control their energy consumption through knowledge of where their energy is being used on a real-time basis. Participants and nonparticipants were surveyed as part of this study which produced the following key findings:

- There was mixed evidence whether the Sense Monitor may be encouraging energy-saving behaviors in the use of non-lighting and non-HVAC energy-using equipment.
- There was very limited evidence that the Monitor is encouraging energy-saving behaviors in the use of HVAC equipment.
- Nonparticipants reported energy-saving lighting behaviors more frequently than the participants.
- 74% of participants were satisfied with the pilot program and 67% were satisfied with the Sense Monitor.
- While interest in using the Monitor has declined overtime, most participants still check the Monitor daily or weekly.
- Some participants found other benefits from the Monitor such as home security and power outage detection.
- 90% of nonparticipants said they would be interested in participating in a pilot with a free Monitor or similar device.

**Programs to which the Results of the Study Apply:**

N/A

**Evaluation Recommendations included in the Study:**

If National Grid expands the Sense pilot to a full-scale program, more customer education will be needed. National Grid will also need to consider subsidizing some of the costs of the Monitors for customers.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

No recommendations were adopted as part of this evaluation.

**Savings Impact:**

N/A

**RI-21-RE-AppRecycling - Appliance Recycling Impact Factor Update**

**Type of Study:** Impact and NTG  
**Evaluation Conducted by:** NMR, Cadeo  
**Date Evaluation Conducted:** August 3, 2021

**Evaluation Objective and High-Level Findings:** This study calculated gross and net savings estimates for refrigerators and freezers recently recycled through the National Grid Rhode Island Recycling Programs. The savings are based on program tracking data from and participant survey results from prior and in-progress studies of a similar program in Massachusetts. The study results yield the retrospective gross and adjust gross program savings reported in Table 1.

**Table 1: Current and Recommended TRM and PSD Values**

| Savings Input              | Freezer |             | Refrigerator |             |
|----------------------------|---------|-------------|--------------|-------------|
|                            | Current | Recommended | Current      | Recommended |
| <b>Rhode Island</b>        |         |             |              |             |
| <b>Gross Savings (kWh)</b> | 724     | 754         | 1,004        | 983         |
| <b>Realization Rate</b>    | 0.68    | 0.83        | 0.88         | 0.90        |
| <b>NTG Ratio</b>           | 0.56    | 0.50        | 0.44         | 0.46        |

**Programs to which the Results of the Study Apply:**  
Energy Star Products

**Evaluation Recommendations included in the Study:**  
The study recommends incorporating the values in Table 1 into the next revision of the Rhode Island Technical Reference Manual (TRM)

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**  
National Grid will adopt the recommendations

**Savings Impact:** Net savings increase for both measures.

**RI-19-XE-Rhode Island Strategic Electrification Study**

**Type of Study:** Market Assessment Study

**Evaluation Conducted by:** Cadmus

**Date Evaluation Conducted:** December 2020

**Evaluation Objective and High-Level Findings:**

The Rhode Island Strategic Electrification Study assesses the cold-climate heat pump market, optimum pathways for heat pump adoption, and opportunities to facilitate market growth. Combining a detailed market assessment with modeling analysis, the study finds that there are significant opportunities for heat pump implementation in the Rhode Island market.

In line with previous research, the study finds there to be generally low awareness of heat pump technology among both residential and commercial customers

As found in prior research, the high cost of heat pump installation also presents a major barrier to adoption, with the average customer noting they were “not very likely” to install a heat pump without incentives. Providing sufficient incentives is therefore needed to encourage customers to consider the technology.

Heat pump costs have been increasing over the last several years at an average of 0.6 – 1.7% per year. The study finds that this is partially attributable to increasing efficiency, new technologies, and the increased adoption of multi-zone ductless systems.

Scenario modeling found that, across building typologies, heat pumps are cost-effective for both customers and program administrators when displacing oil, propane and electric resistance heating, even when new cooling loads are added to a building.

**Programs to which the Results of the Study Apply:**

Residential EnergyStar HVAC

C&I Lost Opportunity

**Evaluation Recommendations included in the Study:**

There were no formal recommendations provided for this study.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

N/A

**Savings Impact:**

N/A

**RI-20-XG-GasPeak – Residential Gas Peak Demand Savings**

**Type of Study: Impact – Gas Load Shape**

**Evaluation Conducted by: Guidehouse**

**Date Evaluation Conducted: June 2021**

**Evaluation Objective and High-Level Findings:**

The Evaluation Team derived natural gas end-use consumption estimates for National Grid customers in RI by applying adjustment factors to models originally developed using metered data in Massachusetts. This work produced average consumption estimates by time period (annual, monthly, coldest observed day) and day type (weekday vs. weekend/holiday) for boilers, furnaces, domestic hot water (DHW) and clothes dryers.

This research had several key findings:

- Heating end uses account for the vast majority of gas consumption during the Coldest Day; therefore, programs addressing peak demand should focus on furnaces and boilers first
- Heating also accounts for most annual consumption, though DHW has a larger share; therefore, programs for energy efficiency may benefit from including DHW as well
- Clothes dryers account for an insignificant amount of Coldest Day and annual consumption but may be worth including in demand response programs due to ease of shifting their load to a different time of day.

**Programs to which the Results of the Study Apply:**

All Residential Gas Programs

**Evaluation Recommendations included in the Study:**

**Recommendation 1:** If consumption estimates with greater precision, hourly load shapes, or multifamily results are desired, a metering study would be needed to collect detailed consumption data specific to RI.

**Recommendation 2:** If design day consumption estimates are desired, further analysis involving building simulation modeling could be used to produce those results. The value added by producing design day estimates depends on the intended use of the study. If the objective is to manage peak demand in a typical year, then the coldest observed day values are appropriate to use. However, if consumption estimates for extreme weather events are needed (e.g. for use in system planning), then design day values would be necessary.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

These recommendations are under consideration and will be reviewed if and/or when another study is completed to determine their applicability.

**Savings Impact:** No direct savings impact.

**RI-20-XG-GasPeak – C&I Gas Peak Demand Savings**

**Type of Study: Impact – Gas Load Shape**

**Evaluation Conducted by: DNV-GL**

**Date Evaluation Conducted: January 2021**

**Evaluation Objective and High-Level Findings:**

The study was designed to answer the following research questions:

- 1. What are the peak demand to annual usage ratios associated with the EE or DR measures previously identified for the Gas Potential for National Grid – Rhode Island?
- What are the 8,760-hourly and 365-day load shape savings ratios to apply to each end use component and DSM potential measure?

The load shape library developed for this study provides a solid basis for National Grid – Rhode Island to use in tracking peak gas demand and savings.

- The methods and formats of load shapes developed for the study can be easily applied to upgrade the end use load shapes as additional sources are identified, including any future load studies conducted by National Grid for Rhode Island or any of its regional service areas.
- Other uses for this load shape library include:
  - Conversion of DSM Potential and other annual end use estimates for baseline and energy savings to any peak definition
  - Provide a baseline on which to project, estimate and evaluate demand response programs targeted at specific appliances.
  - Use of 8,760 end use load shapes for production cost model inputs to calculate system or distribution model effects
- Industrial load shapes were not developed for process loads (production or manufacturing application) since these are very industry-specific and subject to operating hours for specific industrial facilities and such data was not readily available for National Grid – Rhode Island customers. The portion of industry customer loads for heating and non-process loads for water heating, cooking, laundry and dishwashing can be taken from the warehouse segment end uses, which are considered applicable, given no other specific data sources.

**Programs to which the Results of the Study Apply:**

All C&I Gas Programs

**Evaluation Recommendations included in the Study:**

Recommendation 1: National Grid should consider additional studies of existing interval load data, such as the 628 interval load data points used in this study, as well as take advantage of forthcoming interval data made possible from electric and gas Automated Metering Infrastructure (AMI) data, as those systems are expanded within the regional service areas of National Grid.



Recommendation 2: National Grid should consider investing in some additional end use load studies, including both electric and gas end uses (where the same technology but a different fuel is used). Given the importance and dominance of heating end uses in the service area and its key role in the peak, heating should be the primary target of end use load studies. Other end uses, especially water heating, dryers and cooking, could also be “borrowed” from electric studies of their end use counterparts, given the similar operating hours, and would be more cost-effectively metered

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

These recommendations are under consideration and will be reviewed if and/or when another study is completed to determine their applicability.

**Savings Impact:**

No direct savings impact.

**Net-to-Gross Research of RCD and Select Products Measures (MA20R28)**

**Type of Study: Impact – NTG Study**

**Evaluation Conducted by: Guidehouse**

**Date Evaluation Conducted: August 2021**

**Evaluation Objective and High-Level Findings:**

This study applied new from the net-to-gross (NTG) results of RCD and select Residential Retail measures in Massachusetts. This research included single-family and multifamily participant surveys, and participating contractor interviews. The team provides a summary of the NTG scores calculated through this research effort, along with the scores that the PAs are currently using. For RI, the study applied new NTG results for the residential gas and electric HVAC programs.

| Fuel Type                     | Measure Group       | Number of Useable Participant Survey Responses | Number of Useable Contractor Survey Responses | Weighted FR (measure level) | Participant SO (program level) | Contractor SO (measure level) | BCR Model NTG* | Current Study NTG |
|-------------------------------|---------------------|--|---|-----------------------------|--------------------------------|-------------------------------|----------------|-------------------|
| <b>From Current NTG Study</b> |                     |  |   |                             |                                |                               |                |                   |
| Electric                      | Direct Install**    | 1  | -   | 25%                         | 12%                            | -                             | 100%           | 87%               |
|                               | Electric HVAC       | 159  | 50  | 34%                         | 12%                            | 10%                           | 78%            | 88%               |
|                               | Non-Electric HVAC** | 26   | 53  | 33%                         | 12%                            | 1%                            | 80%            | 80%               |
|                               | Thermostats         | 53   | -   | 13%                         | 12%                            | -                             | 83%            | 99%               |
|                               | Water Heaters*      | 38   | 19  | 19%                         | 12%                            | 0%                            | 81%            | 93%               |
|                               | Weatherization      | 50   | 30  | 27%                         | 12%                            | 6%                            | 123%           | 90%               |
| Natural Gas                   | Direct Install**    | 14   | -   | 3%                          | 12%                            | -                             | 100%           | 109%              |

|                                       |     |    |     |     |     |      |     |
|---------------------------------------|-----|----|-----|-----|-----|------|-----|
| Non-Electric HVAC                     | 140 | 53 | 36% | 12% | 1%  | 86%  | 76% |
| Thermostats                           | 82  | -  | 25% | 12% | -   | 83%  | 87% |
| Water Heaters                         | 58  | 19 | 34% | 12% | 0%  | 79%  | 77% |
| Weatherization                        | 60  | 30 | 35% | 12% | 6%  | 126% | 83% |
| <b>From Energy Optimization Study</b> |     |    |     |     |     |      |     |
| Electric Heat Pumps, fuel switching   | 320 | 50 | 31% | 12% | 10% | 87%  | 91% |

**Programs to which the Results of the Study Apply:**

Electric Energy Star HVAC and Gas Energy Star Heating System

**Evaluation Recommendations included in the Study:**

There were no formal recommendations provided for this study.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

N/A - Though not a formal recommendation, the results included above were applied to the electric Energy Star HVAC and gas Energy Star Heating System.

**Savings Impact:**

For the electric Energy Star HVAC, savings increased due to applying the updated NTG results. For the gas Energy Star Heating System, savings were reduced due to applying the updated NTG results.

**RCD Virtual Assessment Study**

**Type of Study:** Market Characterization or Assessment Evaluation

**Evaluation Conducted by:** Guidehouse

**Date Evaluation Conducted:** 03/12/2021

**Evaluation Objective and High-Level Findings:**

In response to COVID-19 social distancing requirements, the Massachusetts Program Administrators transitioned the Residential Coordinated Delivery (RCD) initiative’s in-person home energy assessments (HEA) to virtual home energy assessments (VHEA). The study identified lessons learned from the transition to VHEAs so the PAs can apply them to future RCD cycles and maximize the value of this new delivery mechanism.

The key findings are:

1. Most VHEA participants were satisfied with their virtual experience.
2. VHEA-based scopes of work are less accurate, which has adverse implications for contractors.
3. In-service rates are much lower for self-installed measures.
4. VHEAs are a viable, yet imperfect, delivery method.

**Programs to which the Results of the Study Apply:**

Residential EnergyWise Single Family Program

**Evaluation Recommendations included in the Study:**

The evaluation team recommends using the weighted In-Service Rates by measure:

| Measure           | In-Service Rate (ISR) |            |           | Overall ISR                                |
|-------------------|-----------------------|------------|-----------|--|
|                   | HEA                   | VHEA (HPC) | VHEA (LV) | Weighted (By Assessment Type and Assessor) |
| LED lightbulbs    | 100%                  | 63%        | 83%       | <b>87%</b>                                 |
| Showerheads       | 100%                  | 38%        | 53%       | <b>66%</b>                                 |
| Faucet aerators   | 100%                  | 54%        | 59%       | <b>74%</b>                                 |
| Smart power strip | 76%                   | 65%        | 78%       | <b>73%</b>                                 |
| Thermostats       | 100%                  | 53%        | 59%       | <b>79%</b>                                 |

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid adopted the results of this study with some adjustments to account for programmatic differences between the RI EnergyWise and MA HES programs. National Grid calculated the weighted ISRs based on the VHEA (LV) in-service rates from this study and the RI-specific in-service rates for EnergyWise direct install measures (see below).

| Measure           | In-Service Rate (ISR) |                         |           | Overall ISR   |
|-------------------|-----------------------|-------------------------|-----------|---|
|                   | EWSF                  | VHEA (HPC) <sup>1</sup> | VHEA (LV) | Weighted (By Assessment Type and Assessor) <sup>2</sup>                     |
| LED lightbulbs    | 100%                  | NA                      | 83%       | <b>95%</b>  |
| Showerheads       | 98%                   | NA                      | 53%       | <b>85%</b>  |
| Faucet aerators   | 98%                   | NA                      | 59%       | <b>86%</b>  |
| Smart power strip | 84%                   | NA                      | 78%       | Not a direct install measure. Kept ISR at 84% based on recent RI EWSF study |
| Thermostats       | 100%                  | NA                      | 59%       | <b>88%</b>  |

<sup>1</sup> NA means Not Applicable. The EnergyWise Single Family program is delivered through a lead vendor and does not use Home Performance Contractors (HPCs)

<sup>2</sup> The weighted in-service rates are based on National Grid forecast of 30% virtual audits and 70% in-person audits in 2022.

**Savings Impact:**

The application of this study reduced claimable savings.

**MA19R17-B-TRM Comprehensive TRM Review**

**Type of Study:** Impact

**Evaluation Conducted by:** Guidehouse

**Date Evaluation Conducted:** 04/12/2021

**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. Table 1 summarizes the measures and recommended TRM updates based on this study.

**Table 1: Summary of Recommended TRM Parameter Value Updates**

| Measure Name  | Parameter Name  | Unit  | Existing Value                  | Proposed Value                            |
|---|---|-------|---------------------------------|---|
|   | Effective Useful Life (EUL)                               | Years | 20                              | 23  |
| Boiler, Gas Forced Hot Water<br>(RES-HVAC-BGFHW)                          | Baseline Efficiency, ER                                   | AFUE  | 80.0% nameplate<br>77.4% actual | 85.5% nameplate<br>77.4% actual           |
|   | Baseline Efficiency, ROF                                  | AFUE  | 82.0% nameplate<br>79.3% actual | 86.5% nameplate<br>83.7% actual           |
| Boiler, Oil/Propane Forced Hot Water<br>(RES-HVAC-BFHW)                   | Baseline Efficiency, Oil, ROF                             | AFUE  | 83.0%                           | Through 2020: 83.0%<br>2021 and on: 86.0% |
|   | Baseline Efficiency, Propane, ROF                         | AFUE  | 82.0% nameplate<br>79.3% actual | 86.5% nameplate<br>83.6% actual           |
| Central Air Conditioning<br>(RES-HVAC-CAC)                                | Baseline Efficiency, ER                                   | SEER  | 10.0                            | 13.5 nameplate<br>12.0 actual             |
|   | Baseline Efficiency, ROF                                  | SEER  | 13.0                            | 14.0                                      |
| Central Ducted HP Fully Displacing Existing Furnace (RES-HVAC-FSHP)       | Baseline Efficiency, Oil, ER                              | AFUE  | 78%                             | 79%                                       |
| Central Ducted HP Partially Displacing Existing Furnace (RES-HVAC-FSHP-P) | Baseline Efficiency, Oil, ER                              | AFUE  | 78%                             | 79%                                       |
| Clothes Dryer<br>(RES-A-CD)   | EUL, Electric   | Years | 12                              | 16  |
|   | EUL, Gas  | Years | 12                              | 17  |
|   | Baseline % Split of Indirect vs Storage Water Heater (WH) | %     | 80% Indirect,<br>20% Storage    | 24% Indirect,<br>76% Storage              |

| Measure Name  | Parameter Name   | Unit        | Existing Value  | Proposed Value                                   |
|---|--|-------------|---|--|
| Combo Condensing Boiler/Water Heater (RES-HVAC-CCBWH) | Baseline Efficiency, Boiler, ER                        | AFUE        | 80.0% nameplate<br>77.4% actual                               | 85.5% nameplate<br>77.4% actual                  |
|   | Baseline Efficiency, Boiler, ROF                       | AFUE        | 82.0% nameplate<br>79.3% actual                               | 86.5% nameplate<br>83.7% actual                  |
|   | Baseline Efficiency, WH, ER Blended Medium-, High-Draw | UEF         | 0.55  | 0.58   |
| Dehumidifier (RES-PL-DH)                              | Capacity   | Pints/Day   | 35  | Remove   |
|   | Efficiency   | Liters/kWh  | Retirement: 1.0<br>Baseline: 1.5<br>Measure: 2.0              | Retirement: 1.6<br>Baseline: 2.8<br>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<br>Retirement: 152.7                               | New: 82.3<br>Retirement: 407.1                   |
|   | Demand Savings   | kW          | New: 0.04<br>Retirement: 0.04                                 | New: 0.02<br>Retirement: 0.10                    |
|   | EUL  | Years       | 12  | 17   |
| ECM Circulator Pump (RES-HVAC-ECMCP)                  | CF <sub>WP</sub>                                       | -           | 0.16  | 0.53   |
| Furnace, Gas (RES-HVAC-FG)                            | EUL  | Years       | 18  | 17   |
|   | Baseline Efficiency, ER                                | AFUE        | 78.0% nameplate<br>78.9% actual                               | 85.0% nameplate<br>81.0% actual                  |
|   | Baseline Efficiency, ROF                               | AFUE        | 85.0%   | 89.0% nameplate<br>90.1% actual                  |
| Furnace, Oil/Propane (RES-HVAC-FOP)                   | Baseline Efficiency, Propane, ROF                      | AFUE        | 85.0%   | 89.0% nameplate<br>90.1% actual                  |
| 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   |
| Insulation (RES-BS-I)                                 | Heating Degree-Days, Cooling Degree-Hours              | HDD, CDH    | Varies by City, see <b>Error! Reference source not found.</b> |  |

| Measure Name   | Parameter Name                              | Unit      | Existing Value  | Proposed Value   |    |
|--|---|-----------|---|--|----|
| Low-Flow Showerhead<br>(RES-WH-S)                                    | EUL   | Years     | 7   | 15   |    |
|  | EUL   | Years     | 7   | 15   |    |
| Low-Flow Showerhead<br>with Thermostatic<br>Valve<br>(RES-WH-STV)    | Electric (Single Family)                    | kWh       | 372   | 247  |    |
|  | Electric (Single Family)                    | kW        | 0.08  | 0.06   |    |
|  | 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<br>(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<br>2S: 66 high, 33 low<br>VS: 50 high              | Baseline: 97<br>2S: 97 high, 48 low<br>VS: 77 high, 31 low       |    |
|  | Daily Operating Hours                       | Hours/day | Baseline: 8.5<br>2S: 2 high, 12.5 low<br>VS: 2 high, 18 low     | Baseline: 5.7<br>2S: 2 high, 9.5 low<br>VS: 2 high, 15.7 low     |    |
|  | Energy Factor                               | EF        | Baseline: 2.1<br>2S: 2.0 high, 5.2 low<br>VS: 4.0 high, 8.8 low | Baseline: 2.0<br>2S: 1.9 high, 5.3 low<br>VS: 2.9 high, 10.5 low |    |
|  | Energy Savings                              | kWh/year  | 2S: 842, VS: 1,062  | 2S: 639, VS: 1,284   |    |
|  | Demand Savings                              | kW        | 2S: 0.87, VS: 1.12  | 2S: 0.67, VS: 1.35   |    |
|  | EUL   | Years     | 10  | 6  |    |
|  | Programmable<br>Thermostat<br>(RES-HVAC-PT) | EUL       | Years   | 15   | 19 |
|  |   | EUL       | Years   | 15   | 19 |
| Quality Installation<br>with Duct<br>Modification<br>(RES-HVAC-QIDM) | Energy Savings                              | kWh/year  | 513   | 230  |    |
|  | Demand Savings                              | kW        | 0.85  | 0.18   |    |
| Room Air Cleaner<br>(RES-PL-RAC)                                     | Energy Savings                              | kWh       | 391   | Varies; see <b>Error!</b><br><b>Reference source not found.</b>  |    |



| Measure Name                            | Parameter Name          | Unit                | Existing Value  | Proposed Value  |
|---|-------------------------|---------------------|---|---|
| Room Air Conditioner (RES-PL-ROOMAC)    | EUL                     | Years               | 8   | 12  |
| Stand Alone Water Heater (RES-WH-SASWH) | Baseline Efficiency, ER | UEF                 | Medium Draw: 0.52<br>High Draw: 0.58<br>Blended: 0.55         | Medium Draw: 0.56<br>High Draw: 0.60<br>Blended: 0.58 |
|   | EUL                     | Years               | 13  | 10  |
| Thermostatic Valve (RES-WH-TV)          | EUL                     | Years               | 7   | 15  |
| Variable Frequency Drive (RES-MAD-VFD)  | Energy Savings          | kWh/HP              | Varies by type; see <b>Error! Reference source not found.</b> |   |
|   | Demand Savings, Summer  | kW/HP <sub>SP</sub> | Varies by type; see <b>Error! Reference source not found.</b> |   |
|   | Demand Savings, Winter  | kW/HP <sub>WP</sub> | Varies by type; see <b>Error! Reference source not found.</b> |   |

**Programs to which the Results of the Study Apply:**

- Residential EnergyStar Products
- Residential EnergyStar HVAC
- Residential EnergyWise Electric and Gas – Multifamily programs
- Residential Income-Eligible Electric and Gas –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 1 for more details.

**Low Income Multifamily Health NEI (TXC 50)**

**Type of Study:** Impact

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 8/12/2021

**Evaluation Objective and High-Level Findings:**

The objective of this study was to quantify and monetize the health- and safety-related NEIs attributable to improvements in the energy efficiency of multifamily buildings served through the Mass Save<sup>®</sup> income-eligible coordinated delivery initiative. Monetization entails valuing the impacts of weatherization services on program recipients by calculating money saved, or the dollar value of costs avoided, due to changes in health issues and household budgets resulting from weatherization. For ease of reading, this report refers to the population that is the focus of study as *low-income* households living in *multifamily* buildings.

Four of the NEIs this study explored – Arthritis, Thermal Stress (Cold), Home Productivity, and Reduced Fire Risk – met the adoption criteria that were set in advance:

- The NEI accrues at the household level, which is the level at which the PAs are currently able to claim NEIs.
- The NEI is not derived from energy bill savings and so do not risk double-counting.
- For NEIs that rely on primary data, both the results of the difference in means analysis (unadjusted estimate) and the coefficient of the weatherization variable in the regression model (regression-adjusted estimate) are statistically significant at p-value <.10 for the outcome of interest. For the one NEI that relies on secondary data only (Reduced Fire Risk), there is sufficient incidence rate and risk factor data from secondary sources to monetize the NEI from these sources.

**Programs to which the Results of the Study Apply:**

The findings of this study are applicable to all Air sealing, Insulation, and Heating measures provided in the Low Income multifamily program. It is important to note that these multifamily values are unique to this type of housing and are not applicable to single family values.

**Evaluation Recommendations included in the Study:**

The Arthritis, Thermal Stress (Cold), Home Productivity, and Reduced Fire Risk NEIs meet all criteria described above. The study team recommends that the PAs adopt the monetized value of these four LIMF health-and-safety-related NEIs. The annual values for each NEI are Arthritis, \$49; Thermal Stress (Cold), \$1,426; Home Productivity, \$49; and Reduced Fire Risk, \$13. The total annual value of the recommended household NEI values per unit, excluding societal benefits, is \$1,537.

**Estimated Annual Values for Recommended NEIs Per Housing Unit, with VSL**

| <b>NEI Values</b>  | <b>Per Year</b> |
|--|-----------------|
| Arthritis  | \$49            |
| Thermal Stress (Cold)  | \$1,426         |
| Home Productivity  | \$49            |
| Reduced Fire Risk  | \$13            |
| <b>Annual Total of Recommended NEIs per Weatherized Housing Unit</b> | <b>\$1,537</b>  |

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid is adopting these values for both Massachusetts and Rhode Island

**Savings Impact:**

Annual per unit \$ values increased to the above recorded values.

**Residential New Construction Quick Hit NEI Study (MA20X14-RNCNEI)**

**Type of Study:** Impact Study  
**Evaluation Conducted by:** NMR Group  
**Date Evaluation Conducted:** 3/5/2021

**Evaluation Objective and High-Level Findings:**

The primary goal of this quick hit study was to use secondary data to identify and propose possible updates to the NEI values associated with the MA PAs’ Residential New Homes and Renovations initiative where possible. A secondary goal of the study was to identify potential additional NEIs that are not currently claimed.

Overall, the evaluator reviewed 41 studies to inform current NEI updates, monetizing new NEIs with secondary data and identifying potential NEIs for future research. The literature review did not yield any new energy-efficiency program evaluations which included primary research for RNC-related NEIs, nor did it yield any evaluations that attempted to monetize RNC NEIs using primary or secondary data.

The evaluation team therefore recommended adjusting the NEIs that the RNC program currently claims for inflation as a short-term solution to the lack of new research monetizing these NEIs in new residential buildings. The adjustment led to an increase in thermal comfort and noise reduction NEIs from a total value of \$117 to \$139 per home per year.

**Recommended Update to RNC NEI Values (Based on Inflation Adjustment)**

| RNC NEI Values                        | Date        | Value |
|---------------------------------------|-------------|-------|
| 2011 RNC NEI Study Value <sup>1</sup> | August 2011 | \$117 |
| 2021 Inflation Adjustment             | May 2021    | \$139 |

The team monetized additional NEIs to account for gas stove impacts on asthma, totaling \$3.28 per home per year. An additional NEI was monetized for the impact of reduced formaldehyde due to mechanical ventilation with heat or energy recovery (ERV or HRV), which leads to fewer asthma-related emergency room visits, totaling \$0.02 per home per year.

**Short Term Recommended Asthma Related RNC NEIs**

| Measure   | Non-Energy Impact                              | Value Suggested               |
|---|--|-------------------------------|
| Electric Stoves (NO <sub>2</sub> )                                | Childhood asthma prevention, occupant lifetime | \$0.65 per household per year |
|   | Adult asthma symptom reduction                 | \$2.21per household per year  |
|   | Childhood asthma symptom reduction             | \$0.42 per household per year |
| ERV/HRV <sup>1</sup> (formaldehyde)                               | Reduced asthma ED visits                       | \$0.02 per household per year |
| <sup>1</sup> Energy Recovery Ventilator/Heat Recovery Ventilator. |  |                               |

NMR found that updated program requirements or pathways, such as an all-electric pathway, are potential avenues to increase monetized NEIs for asthma-related impacts and should be explored further.

**Programs to which the Results of the Study Apply:**

Residential New Construction Single Family and Renovations and Additions offerings.

**Evaluation Recommendations included in the Study:**

In the short term, the study recommends adopting a total NEI of **\$142.33** per home per year. This is based on an inflation adjustment approach that updated the RNC NEI values currently claimed by the MA PAs from \$117 to \$139. In addition, the study also recommended that PAs adopt an asthma related RNC NEI of \$3.30 per household per year in the short term.

Based on literature review findings, the evaluation team also identified the following areas PAs should explore for a future RNC NEI study involving primary research.

| <b>NEI Category</b>                                 | <b>Summary of Research Recommendation</b>  |
|---|--|
| Thermal Comfort                                     | Update the 2011 Thermal Comfort NEI with new field research and occupant surveys rather than simply adjusting for inflation.                   |
| Summer Overheating and Winter Underheating          | Account for the potential that PH construction in particular can lead to uncomfortable indoor temperatures in summer and winter.               |
| Noise   | Update the 2011 Noise NEI with new field research and occupant surveys rather than simply adjusting for inflation.                             |
| Respiratory Health and Sick Building Syndrome (SBS) | Measure additional respiratory impacts from air pollutants not covered in the asthma algorithms, as well as SBS symptoms.                      |
| Operations and Maintenance                          | Document the amount of maintenance and operational costs required for high-performance compared to baseline homes.                             |
| Productivity  | Survey occupants and incorporate secondary literature on the impacts of improved air quality on productivity for residents who work from home. |
| Avoided Deaths due to Air Pollution                 | Measure indoor and outdoor particulate matter and infiltration rates to quantify reductions in exposure and excess mortality.                  |

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

Yes

**Savings Impact:**

Annual Per Unit \$ value increased from \$117 to \$142.33.

**Low-rise Residential New Construction Net-to-Gross Study**

**Type of Study:** Net-to-Gross

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 7/24/2020

**Evaluation Objective and High-Level Findings:**

The first goal of the study was to estimate retrospective NTG ratios for single-family and low-rise multifamily homes permitted in 2017-2019. The second objective of the study was to determine annual prospective NTG ratios for single-family and low-rise multifamily homes permitted in 2022-2024. The evaluation provided estimated retrospective and prospective net savings for single-family and low-rise multifamily homes split by program participation and building code.

The study reported that Single-family NTG has decreased due to high program penetration, reducing the population for spillover. Multifamily NTG is higher than single-family NTG because there is much lower program penetration in the multifamily market in Massachusetts.

| <b>Year</b> | <b>Single-family</b> | <b>Multifamily</b> | <b>Overall</b> |
|-------------|----------------------|--------------------|----------------|
| 2022        | 0.30                 | 1.02               | 0.49           |
| 2023        | 0.29                 | 0.84               | 0.43           |
| 2024        | 0.27                 | 0.71               | 0.38           |

Findings show that PAs’ RNC efforts had the greatest impact on duct leakage, air leakage, foundation walls, and electric water heaters. However, the overall impact of the RNC efforts, as estimated by the Delphi panel, decreased across most measures since the previous study, most notably for lighting, duct leakage, and air leakage.

Duct and air leakage are still identified as the top two measures most impacted by the RNC efforts. Delphi panelists also indicated that the RNC efforts had substantial impact on insulation Grade (i.e., installation quality).

**Programs to which the Results of the Study Apply:**

Residential New Construction Single Family and Low-Rise offerings.

**Evaluation Recommendations included in the Study:**

The study recommends adopting the prospective net-to-gross ratio for 2022. The study also recommended that PAs should explore new ways to generate savings in the RNC market. Moving forward PAs should claim net savings from the code promulgation efforts separately from other RNC efforts examined in this study.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

Using learnings from the MA Study, National Grid and C-Team negotiated a 75% NTG ratio which will be applied prospectively in 2022 to RI RNC Single Family and Low-Rise initiatives.

**Savings Impact:**

Net-to-Gross decreased from 100% to 75%.

**Renovations and Additions Net-to-Gross Study**

**Type of Study:** Net-to-Gross

**Evaluation Conducted by:** NMR Group

**Date Evaluation Conducted:** 9/28/2020

**Evaluation Objective and High-Level Findings:**

The purpose of this study was to establish retrospective Net-to-Gross ratios for 2019 and prospective NTG ratios to inform planning for the 2022-2024 program cycle for the Renovations and Additions Residential New Construction offering. The study sought to account for programmatic changes in the baseline when determining the prospective NTG ratio. The study also attempted to analyze results of survey questions to better understand topics such as program experience, NEIs, program satisfaction, COVID-19 impacts, and barriers to participation.

The study produced the following retrospective and prospective NTG ratios:

**Prospective 2022 to 2024 NTG Results**

|                          | <b>FR</b> | <b>PSO</b> | <b>NPSO</b> | <b>Prospective NTGR</b> |
|--------------------------|-----------|------------|-------------|-------------------------|
| Retrospective 2019       | 34%       | 2%         | 17%         | 85%                     |
| Prospective 2022 to 2024 | 22%       | 2%         | 12%         | 92%                     |

The evaluation reported that participant satisfaction and likelihood of recommending program are high. Homeowners also reported increased comfort of their home and reduced noise from the water heater, heating and cooling equipment, and outside the home.

The study found that there are still significant barriers to participation, however. Lack of awareness of the initiatives and the extra hassle of participating were the main barriers preventing more contractors from participating in the Renovations and Additions offerings.

**Programs to which the Results of the Study Apply:**

Residential New Construction Renovations and Additions offerings/initiatives.

**Evaluation Recommendations included in the Study:**

PAs should use the recommended prospective Net-to-Gross ratios for 2022, and for 2023 and 2024 if the MA PAs do not measure NTG again before then. In addition, the study recommended that moving forward implementation contracts should track project contact information for both the homeowner and primary contractor.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

The prospective Net-to-gross ratio (92%) from MA study will be applied to RI Renovations and Additions initiatives for 2022.



**Savings Impact:**

Net-to-Gross decreased from 100% to 92%.

**Residential Downstream/Upstream Products Net-to-Gross Study**

**Type of Study:** Net-to-Gross Evaluation, Impact Evaluation

**Evaluation Conducted by:** NMR Group, DNV

**Date Evaluation Conducted:** 6/8/2021

**Evaluation Objective and High-Level Findings:**

The study goals were to establish retrospective net-to-gross ratios (NTGRs) and in-service rates (ISRs) for 2019 and develop prospective NTGRs and ISRs for 2022 to 2024 for eight products that are supported through the Residential Retail and Residential Coordinated Delivery initiatives.

The studied methods included the following:

- a literature review to examine recent ISR and NTGR findings from other jurisdictions for all eight products
- a participant survey of households that had purchased or received advanced power strips (APSS) or dehumidifiers through the residential initiatives
- consensus process to review the results, estimate retrospective 2019 ISRs and NTGRs, and recommend prospective ISRs and NTGRs for 2022 to 2024

Because the consensus process yielded the same ISRs for 2019 as for 2022 to 2024, the study also suggests applying the ISRs to 2020 and 2021. The table below presents the consensus derived ISRs and NTGRs.

**Table 1: Consensus Derived ISRs and NTGRs**

| Product                 | BCR IDs                 | Delivery Methods                      | Consensus Derived Values    |      |      |      |
|-------------------------|-------------------------|---------------------------------------|-----------------------------|------|------|------|
|                         |                         |                                       | ISR                         | NTGR |      |      |
|                         |                         |                                       | 2019, 2022 to 2024          | 2022 | 2023 | 2024 |
| APSS                    | E19A2c073<br>E19A2c0744 | Online Upstream                       | 83%                         | 91%  | 90%  | 88%  |
| APSS                    | E19A2a008               | Leave Behind                          | Addressed in MA20R26-B-VHEA | 95%  | 95%  | 93%  |
| APSS                    | E19A2a008 <sup>3</sup>  | Mailed Kits                           | Addressed in MA20R26-B-VHEA | 93%  | 92%  | 91%  |
| Clothes Dryers          | E19A2c077               | Rebate Form                           | 99%                         | 53%  | 52%  | 52%  |
| Dehumidifiers           | E19A2c075               | Online Rebate Form<br>In-store Rebate | 99%                         | 49%  | 47%  | 45%  |
| Pool Pumps <sup>4</sup> | E19A2a001<br>E19A2a002  | Midstream                             | 100%                        | 89%  | 87%  | 84%  |
| Room Air Cleaners       | E19A2c072               | In-store Rebate                       | 97%                         | 63%  | 61%  | 60%  |

|   |                                  |                                       |      |     |     |     |
|---|----------------------------------|---------------------------------------|------|-----|-----|-----|
| Room Air Cleaners                       | E19A2c072 <sup>3</sup>           | Online Rebate Form                    | 97%  | 70% | 68% | 66% |
| Room Air Conditioners                   | E19A2c086                        | Online Rebate Form<br>In-store Rebate | 100% | 56% | 54% | 52% |
| TSVs and Low-flow Showerheads with TSVs | E19A2c082<br>though<br>E19A2c085 | Online Upstream                       | 78%  | 97% | 96% | 96% |

**Programs to which the Results of the Study Apply:**

Energy Star Products

**Evaluation Recommendations included in the Study:**

The following recommendations were made by the evaluators conducting this study.

- The Program Administrators (PAs) should use the ISRs and NTGRs in Table 1 to inform planning for the 2022 to 2024 program cycle.
- The PAs should apply the ISRs in Table 1 starting in 2020 and use them until future research or information suggests updates to the estimates.
- The PAs should apply the NTGRs in Table 1 starting in 2022 and use them until future research or information suggests updates to the estimates.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid plans to adopt the recommendations.

**Savings Impact:**

The savings impact depends on the measure. See Table 1 for more details.

**Impact Analysis of Residential Wi-Fi Thermostats (Draft)**

**Type of Study:** Impact

**Evaluation Conducted by:** Guidehouse

**Date Evaluation Conducted:** 06/30/ 2021

**Evaluation Objective and High-Level Findings:**

The primary goal of this study is to estimate electric and gas savings from Wi-Fi and programmable thermostats delivered through direct install programs and retail channels. Table 1 summarizes the measures and recommended savings values based on the draft results of this study.

**Table 1. Recommended savings values**

| <b>Delivery Channel</b> | <b>Rebated Thermostat</b> | <b>Replaced Thermostat</b> | <b>Savings</b> | <b>Savings Unit</b> |
|-------------------------|---------------------------|----------------------------|----------------|---------------------|
| Retail                  | Wifi                      | All                        | 27.9           | Therms per device   |
| Direct Install          | Wifi                      | Manual                     | 45.1           | Therms per device   |
| Direct Install          | Wifi                      | Programmable               | 24.4           | Therms per device   |
| Direct Install          | Wifi                      | Wifi                       | 0              | Therms per device   |
| All                     | Programmable              | All                        | 20.7           | Therms per device   |

**Programs to which the Results of the Study Apply:**

- Residential EnergyStar HVAC
- Residential EnergyWise – Single Family and Multifamily programs
- Residential Income-Eligible – Single Family and Multifamily programs
- C&I Multifamily

**Evaluation Recommendations included in the Study:**

See Table 1.

**Explain Whether or Not National Grid Decided to Adopt Recommendations from the Study:**

National Grid adopted the recommended savings values in the 2022 Plan.

**Savings Impact:**

The application of this study reduced claimable savings.

**RI-21-XX-Jobs - Workforce Associated with Rhode Island Energy Efficiency Programs Analysis Study**

**Type of Study:** Economic Impact

**Evaluation Conducted by:** Guidehouse

**Date Evaluation Conducted:** 2021

**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 2020. This study addresses the requirements of General Law 39-2-1.2, enacted by the Rhode Island General Assembly in 2012. In 2020, National Grid spent a combined \$112,665,924 on the Rhode Island programs that saved 157,346 annual megawatt hours (MWh) of electricity and 318,845 million British thermal units (MMBtu) of natural gas.

The focus of the Energy Efficiency Workforce Analysis Report is to quantify the workforce that was involved in delivering National Grid’s Rhode Island programs in 2020. The workforce analysis reports the number of jobs associated with the programs and compares them to past years. The study also provides narrative context for those findings and observations. 827.5 full-time equivalent (FTE) workers associated with National Grid spending in 2020 for Rhode Island gas and electric energy efficiency programs.

**Summary of FTEs (2015-2020)**

|                                 | 2015         | 2016         | 2017         | 2018               | 2019               | 2020         |
|---------------------------------|--------------|--------------|--------------|--------------------|--------------------|--------------|
| <b>Electric Programs</b>        |              |              |              |                    |                    |              |
| Commercial and Industrial       | 210.0        | 241.1        | 263.5        | 250.0              | 265.0              | 203.7        |
| Residential Income Eligible     | 37.0         | 42.3         | 46.0         | 45.8               | 65.1               | 59.1         |
| Residential Non-Income Eligible | 125.4        | 104.0        | 98.1         | 168.9 <sup>6</sup> | 284.8 <sup>7</sup> | 263.7        |
| <b>Gas Programs</b>             |              |              |              |                    |                    |              |
| Commercial and Industrial       | 32.0         | 36.1         | 34.4         | 31.9               | 28.7               | 19.8         |
| Residential Income Eligible     | 43.8         | 41.4         | 36.5         | 39.4               | 56.2               | 38.5         |
| Residential Non-Income Eligible | 172.1        | 159.3        | 174.9        | 191.6              | 212.6              | 189.2        |
| <b>Other</b>                    |              |              |              |                    |                    |              |
| CAP Agencies <sup>8</sup>       | 34.0         | 38.0         | 35.0         | 35.0               |                    |              |
| National Grid <sup>9</sup>      | 41.6         | 39.9         | 38.2         | 39.5               | 43.3               | 44.4         |
| Marketing <sup>10</sup>         |              |              |              |                    | 9.0 <sup>11</sup>  | 9.0          |
| COVID-19 Training               |              |              |              |                    |                    | 0.3          |
| <b>Total</b>                    | <b>695.8</b> | <b>702.2</b> | <b>726.5</b> | <b>802.1</b>       | <b>964.6</b>       | <b>827.5</b> |

Source: Guidehouse analysis and 2018 study

<sup>6</sup> The total for Residential Non-Income Eligible Electric FTEs in 2018 was incorrectly totaled from the component programs and was shown in previous reports at 170.9, when it should have been 168.9. With this correction, the total number of FTEs in 2018 is 802.1. This change has been reflected in Table 2.

<sup>7</sup> Guidehouse updated the 2019 EnergyWise and EnergyWise Multifamily FTEs based on interviews with RISE on February 24, 2021, March 2, 2021 and written communication with RISE on April 1, 2021. RISE indicated there were 224 FTEs from trade allies associated with the EnergyWise program in 2019. Guidehouse believes these FTEs were not accurately captured in 2019 and in the years prior. This has caused the significant increase in FTEs from 2018 to 2019. RISE indicated there were 20 FTEs from RISE and 15 FTEs from subcontractors associated with the gas and electric EnergyWise Multifamily program in 2019. Guidehouse adjusted the 2019 gas and electric FTEs associated with the EnergyWise Multifamily program to align with the information received from RISE in the 2021 interview. Although this re-estimation of FTEs might also be associated with analyses prior to 2019, since Guidehouse did not prepare these analyses, it did not change any FTEs associated with the EnergyWise program prior to 2019.

<sup>8</sup> Note that for the 2019 and 2020 analysis, CAP Agency staff were included within the Residential Income Eligible program under both Electric and Gas.

<sup>9</sup> 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.

<sup>10</sup> Beginning in 2019, marketing was contracted to a new vendor, resulting in an increase in jobs, these are therefore shown separately.

<sup>11</sup> In the interview with the marketing agency, Mower, on March 12, 2021, Guidehouse discovered there had been a miscommunication in the number of FTEs during the interview with Mower in 2020. Mower had provided the number of FTEs for National Grid programs across all the states the programs run in, not just Rhode Island. There was no change in the number of FTEs associated with the Rhode Island National Grid Rhode Island energy efficiency programs in 2020 when compared to 2019, so Guidehouse adjusted the 2019 value to 9 FTEs.

**Key Findings:**

- 827.5 full-time equivalent (FTE) workers associated with National Grid spending in 2020 for Rhode Island gas and electric energy efficiency programs
- The number of FTEs decreased from 964.6 in 2019, because of decreased program spending
- The size of the workforce and how it did its work in 2020 were highly influenced by the COVID pandemic.
- FTEs reported are for the end of 2020 and capture only enduring changes in FTEs, not temporary layoffs or furloughs.
- As the pandemic persists, vendors and the workforce continue to adapt to the limitations on customer interactions while still responding to a sustained demand for energy efficiency.
- In a counterfactual analysis, if not for the pandemic, the number of FTEs would have increased about 2% relative to 2019, to 986.2 FTE.
- The interviews indicated that there were no reported cases of COVID transmission due to interactions between program implementers and customers.
- 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

## 5. Historical Evaluation Studies

| Sector                       | Program                  | Study type     | 2014   | 2015       | 2016 | 2017       | 2018       | 2019 | 2020 | 2021 | 2022 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 |        |            |      |            |            |      |      |      |           |
| Cross-cutting/<br>Special    | Connected Solutions      | Impact/Process |        |            |      |            |            |      |      |      |           |
|                              | Potential study          | Market         |        |            |      |            |            |      |      |      |           |
|                              | Workforce                | Impact/Market  |        |            |      |            |            |      |      |      |           |
|                              | 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         |        |            |      |            |            |      |      |      |           |
| C&I Gas                      | All                      | NTG            |        |            |      |            |            |      |      |      |           |
|                              | Custom                   | Impact         |        |            |      |            |            |      |      |      |           |
|                              | Prescriptive             | Impact         |        | steam trap |      | steam trap | steam trap |      |      |      |           |
| Small Business               | All                      | NTG            |        |            |      |            |            |      |      |      |           |
|                              | Lighting                 | Impact         |        | presc.     |      |            |            |      |      |      |           |
|                              | Non-Lighting Electric    | Impact         |        |            |      |            |            |      |      |      |           |
|                              | All                      | Process        |        |            |      |            |            |      |      |      |           |
| Small Business               | All                      | Process        |        |            |      |            |            |      |      |      |           |
|                              | All                      | NTG            |        |            |      |            |            |      |      |      |           |

These studies are available through the EERMC<sup>12</sup>, the PUC<sup>13</sup>, and National Grid.

<sup>12</sup> <https://rieermc.ri.gov/plans-reports/evaluation-studies/>

<sup>13</sup> <http://www.ripuc.org/>



**Table 3: Completed Evaluation Studies Applicable in 2022**

| 2021   |   |
|--|---|
| Study  | Impact Descriptions   |
| DNV, Impact Evaluation of PY2019 Upstream Lighting Program, July, 2021                 | This study updated prospective realization rates and impact factors for the C&I Upstream lighting program. The values reflect decreasing ISR values for Screw-in products and increasing ISRs for linear products. These will be applicable for 2022, 2023, and beyond. |
| DNV, Impact Evaluation of PY2019 Custom Gas Installations, September 2021              | The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY2017, PY2018, and PY2019.   |
| DNV, Impact Evaluation of PY2018 Custom Electric Installations, September 2021         | The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from PY2016, MA PY2017/18, and PY2018.  |
| DNV, Impact Evaluation of PY2019 Custom Electric Installations, September 2021         | The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from PY2016, PY2018, and PY2019.  |
| Cadeo, Appliance Recycling Impact Factor Update, June 2021                             | This study updated the gross kWh savings, realization rates and NTG factors for refrigerator and freezer recycling measures.  |
| DNV, Franchise Controls Deemed Savings Study, March 2021 (Leveraged study from MA)     | This study recommended a deemed savings value of 5,344 kWh for a building automation system (BAS) measure that controls small individual food service appliances.   |
| DNV, Lifetime Gross AML Adjustment Analyses, July, 2021 (Leveraged study from MA)      | This study updated Adjusted Measure Lives (AML) for lighting applications, excluding New Construction and stand-alone controls. Overall the programs are seeing decreased AMLs as market adoption accelerates.  |
| DNV, Upstream Lighting NTG, June, 2021 (Leveraged study from MA)                       | This study updated NTG values for upstream lighting technologies, and adjusted the values down significantly due to heavy free-ridership.   |
| DNV, Ground Source Heat Pump eTRM Measure Review, March 2021 (Leveraged study from MA) | This study recommended that GSHPs be broken out from ASHPs into their own category offering in order to allow the program to attribute savings, baselines, and lifetimes in a more defensible way. It also recommended the GSHP lifetime be updated to 25 years.        |

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| DNV, NRNC Market Characterization Study, June 2021 (Leveraged study from MA)                                     | This study produced factors to be applied to IECC 2015-based code LPD to determine baseline LPD requirements.  |
| DNV, Energy Management System ISP Study, 2021 (Leveraged study from MA)  | This study identified industry standard practices for energy management systems, with a particular focus on criteria for determining when an existing system should be considered failed.  |
| DNV, C&I HVAC NTG & Market Effects Measurement, 2021 (Leveraged study from MA)                                   | This study established Net to Gross Ratios for six technologies supported by the Upstream HVAC Initiative.   |
| Guidehouse, RCD Virtual Assessment Study, March 2021 (Leveraged study from MA)                                   | This study found that in-service rates are lower for self-installed measures. Rhode Island leveraged results from this study to update the in-service rates for instant savings measures in the EnergyWise Single Family program.  |
| Guidehouse, Comprehensive TRM Review, April 2021 (Leveraged study from MA)                                       | This study updated savings assumptions and effective useful lives (EUL) of several residential measures in MA. Rhode Island adopted the results from this study to update savings and EUL assumptions for several measures in the residential programs.  |
| NMR, Low Income Multifamily Health NEI (TXC 50), July 2021 (Leveraged study from MA)                             | This study produced NEI values associated with energy efficiency programs in Income Eligible, Multifamily buildings. A total of 4 health and safety NEIs were monetized as part of this study. Arthritis, Thermal Stress (cold), Home Productivity, and reduced fire risk were all found to have Annual Per unit values of \$49, \$1,426, \$49, and \$13, respectively, totaling \$1536. These values are allocated to all applicable air sealing, insulation, and heating measures. |
| NMR, Residential New Construction Quick Hit NEI Study (MA20X14-RNCNEI), September 2021 (Leveraged study from MA) | The study produced updated NEI values for heating related measures offered through the Residential New Construction program. The total Heating NEIs for RNC went from an Annual Per Unit value of \$117 to \$142.33 due to increases in thermal comfort and noise reduction related impacts.   |
| NMR, Residential Downstream/Upstream Products Net-to-Gross Study, June 2021 (Leveraged study from MA)            | This study yielded prospective net-to-gross ratios and retrospective and prospective in-service rates for products supported by the Residential Retail or Residential Coordinated Delivery Initiatives. Rhode Island adopted the results from this study to update 2022 planning assumptions for ENERGY STAR Products program.   |

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| NMR, Low-rise Residential New Construction Net-to-Gross Study, July 2021 (Leveraged study from MA)                    | This study yielded prospective and retrospective net-to-gross ratios for measures supported by the Low Rise Residential New Construction offering. Rhode Island adopted the results from this study to update 2022 planning assumptions.   |
| NMR, Renovations and Additions Net-to-Gross Study, July 2021 (Leveraged study from MA)                                | This study yielded prospective and retrospective net-to-gross ratios for measures supported by the Renovations and Additions Residential New Construction offering. Rhode Island adopted the results from this study to update 2022 planning assumptions.  |
| Guidehouse, Impact Analysis of Residential Wi-Fi Thermostats, Jun 2021 Results Presentation (Leveraged study from MA) | This study updated savings assumptions for programmable and Wi-Fi thermostats delivered through retail and direct install channels. Rhode Island adopted the draft results from this study to update savings for programmable and Wi-Fi thermostat measures in the residential HVAC and retrofit programs. |
| RI-20-XG-GasPeak – C&I Gas Peak Demand Savings  | This study supplied peak gas demand daily percentages of energy consumption by end use and building type for the C&I sector. These results could be used to calculate the gas daily energy savings that have occurred as a result of C&I program activity.   |
| RI-20-XG-GasPeak – Residential Gas Peak Demand Savings  | This study supplied peak gas demand daily percentages of energy consumption by end use for the residential sector. These results could be used to calculate the gas daily energy savings that have occurred as a result of residential program activity.   |
| Net-to-Gross Research of RCD and Select Products Measures (MA20R28)   | For RI, the study applied new NTG results for the residential gas and electric HVAC programs.  |
| <b>2020</b>   |  |
| <b>Study</b>  | <b>Impact Descriptions</b>   |
| 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.   |

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| 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.  |
| 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.   |
| 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, February 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, February 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.   |

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| 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   |
| <b>2019</b>   |   |
| <b>Study</b>  | <b>Impact Descriptions</b>  |
| 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, Wi-Fi 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 Wi-Fi thermostats. Rhode Island adopted these results to update savings assumptions for Wi-Fi thermostats in HVAC and residential retrofit programs.        |
| 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.   |
| <b>2018</b>   |   |
| <b>Study</b>  | <b>Impact Descriptions</b>  |

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| 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 $\leq 15$ 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 2022.   |
| 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.  |
| 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 Residential Wi-Fi 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.  |

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| <p>NMR, Rhode Island Residential Appliance Saturation Survey. October 2018</p>   | <p>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.</p>   |
| <p>Cadeo, Rhode Island Impact Evaluation of Income Eligible Services Single Family Program, August 2018</p>                                      | <p>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.</p>   |
| <p>Navigant, MA Residential Electric Loadshape and Baseline Study (Heating and Cooling Season report). July 2018. (Leveraged study from MA)</p>  | <p>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.</p>  |
| <p>NMR, RLPNC 17-4/17-5 Products Impact Evaluation of In-service and Short-term Retention Rates Study. March 2018. (Leveraged study from MA)</p> | <p>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.</p>  |
| <p>NMR/Tetra Tech, TXC34 Massachusetts Residential HVAC Net-to-Gross and Market Effects Study. July 2018. (Leveraged study from MA)</p>          | <p>This study yielded recommended net-to-gross ratios for selected heating, cooling, and water heating measures that will receive Mass Save® Standard rebates in 2019-2022. Rhode Island adopted the result from this study to inform savings for measures offered through Residential HVAC/HEHE programs.</p>  |
| <p>Tetra Tech, Market-Rate Multifamily NEI – Phase I Final Memo. March 2018.</p>   | <p>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.</p>   |
| <p>Tetra Tech, Non-Energy Impact Framework Study Report. January 2018.</p>   | <p>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.</p> |

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| <p>DNV GL, Evaluation of 2017 Demand Response Demonstration: C&amp;I ConnectedSolutions. February 2018.</p>      | <p>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.</p> |
| <b>2017</b>  |   |
| <b>Study</b>   | <b>Impact Descriptions</b>  |
| <p>NMR, 2017 Rhode Island Single-Family Code Compliance/Baseline Study, July 2017</p>                            | <p>This study yielded the final agreed upon baseline values to update the User Defined Reference Home (UDRH) in Rhode Island</p>  |
| <p>ICF, 2017 Rhode Island Residential Code Savings Analysis</p>  | <p>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.</p>  |
| <p>NBI, 2017 Rhode Island Commercial Code Savings Analysis</p>   | <p>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.</p>  |
| <p>NMR, 2017 Rhode Island Code Compliance Enhancement Initiative Attribution and Savings Study</p>               | <p>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.</p>   |
| <p>New Buildings Institute, Energy Impacts of Commercial Building Code Compliance in Rhode Island, July 2017</p> | <p>This study quantified the energy impacts of energy code compliance patterns from field data collection and analysis of building characteristics.</p>   |
| <p>The Cadmus Group, Inc., Ductless Mini-Split Heat Pump Impact Evaluation, 2016</p>                             | <p>This study estimated savings from various types of heat pumps.</p>   |
| <p>DNV-GL, Impact Evaluation of 2014 Custom HVAC Installations, September 2017</p>                               | <p>The study updated realization rates for custom electric HVAC projects, as part of a study leveraging the MA study of the same program element.</p>   |



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|--|--|
| 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.  |
| <b>2016</b>  |  |
| <b>Study</b>   | <b>Impact Descriptions</b>   |
| 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.   |
| 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. |

|   |   |
|---|---|
| <p>Cadmus Group; Large Commercial and Industrial On-Bill Repayment Program Evaluation, September, 2016</p>  | <p>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.</p>                                  |
| <p>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</p> | <p>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.</p>  |
| <p>DNV GL, Stage 2 Results— Commercial and Industrial New Construction Non-Energy Impacts Study—Final Report, prepared for the Massachusetts Program Administrators, March 2016</p>     | <p>The purpose of this study was to quantify the dollar value of participant NEIs for C&amp;I NC projects completed in 2013, and to estimate gross NEIs per unit of energy savings resulting from NC electric and gas measures separately.</p>  |
| <p><b>2015</b></p>  |   |
| <p><b>Study</b></p>   | <p><b>Impact Descriptions</b></p>   |
| <p>Cadmus, Inc., High Efficiency Heating Equipment Impact Evaluation: Final Report, March 2015</p>  | <p>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.</p>   |
| <p>DNV-GL, Retrofit Lighting Controls Measure Summary of Findings: Final Report (MA), October 2014</p>  | <p>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.</p> |
| <p>Tabors Caramanis Rudkevich, Avoided Energy Supply Costs in New England: 2015 Report, April 2015</p>  | <p>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.</p>      |

|   |   |
|---|---|
| <p>DNV-GL, Massachusetts 2013 Prescriptive Gas Impact Evaluation; Steam Trap Evaluation Phase 1, March 2015</p>                                       | <p>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.</p>   |
| <p>Cadmus, Inc., Cool Smart Incremental Cost Study: Final Report, July 2015</p>   | <p>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.</p> |
| <p>Cadmus, Inc., Lighting Interactive Effects Study Preliminary Results – Draft, April 2015</p>   | <p>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.</p>  |
| <p><b>2014</b></p>  |   |
| <p><b>Study</b></p>   | <p><b>Impact Descriptions</b></p>   |
| <p>DNV GL, 2014 , Impact Evaluation of National Grid Rhode Island C&amp;I Prescriptive Gas Pre-Rinse Spray Valve Measure</p>                          | <p>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.</p>  |
| <p>National Grid, Macroeconomic Impacts of Rhode Island Energy Efficiency Investments REMI Analysis of National Grid’s Energy Efficiency Programs</p> | <p>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. Superseded by 2020 Brattle Group study that revised methods.</p>              |

| 2013   |  |
|--|--|
| Study  | Impact Descriptions  |
| KEMA, Inc., Impact Evaluation of 2011 Rhode Island Prescriptive 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 Rhode Island Custom Lighting Installations   |  |
| 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 $\pm 15\%$ .   |
| 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 $\pm 23\%$ , and identification of factors that influenced the realization rate. |
| 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   |

## 6. EM&V Legislated Study

In 2018, the OER hired a third-party vendor to conduct the Energy Efficiency Program Evaluation Study, as a result of an amendment made to the Least Cost Procurement Law. The objective of the study was to verify energy savings from National Grid Energy Efficiency Programs. The study included the following tasks, research objectives, and high-level findings:

**Task 1: Review of EM&V Process.** This task addressed the research question *“Does the current Evaluation, Measurement, and Verification (EM&V) process in Rhode Island comply with national industry best practices for programs of its size and scope?”*

### Highlights of Key Findings

RI EM&V exhibits many best practices:

- Evaluators are independent but collaborative
- Strategically planned across years for most programs
- Annual planning allows for flexibility to adjust to program and market needs
- Comprehensive for most programs integrating process, impact, and market evaluations
- Uses defensible approaches and rigor

Additional opportunities were identified:

- Develop multi-year strategic plan (with flexibility)
- Narrow timeframe between participation and verification for C&I evaluations

Further details and complete findings can be found in the report: *Task 1: Review of EM&V Processes*.<sup>14</sup>

**Task 2: TRM Benchmarking & Best Practices Review of Evaluation Studies.** This task addressed the research question *“Quantitatively, to what extent are National Grid’s claimed energy savings accurate?”*

### Highlights of Key Findings

Evaluation Reports Review:

- Evaluations are generally high-quality work products that provide actionable recommendations to inform future program planning and implementation

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<sup>14</sup> <http://www.energy.ri.gov/documents/archived-reports/Task%201%20Report.pdf>

TRM Review:

- National Grid regularly uses evaluation results for the enhancement of the Rhode Island TRM.
- Almost all measures received at least one update over the five years of evaluated TRMs.
- Recommendation: Organize the TRM by equipment and measure to make the TRM easier to navigate

Further details and complete findings can be found in the report: *Task 2 Report: TRM Benchmarking & Best Practices Review of Evaluation Studies*.<sup>15</sup>

**Task 3: Analysis of Bills and Customer Experience Evaluation.** This task addressed the research question “*Are there savings estimation and program implementation improvements that can be identified to help customers that have or are likely to experience a substantial difference in estimated gross energy savings versus installed gross energy savings and visible bill savings?*”

Highlights of Key Findings

National Grid reported savings for C&I customers are reasonable.

- Electric billing analysis estimates were generally lower but were positively correlated with National Grid reported savings.
- Gas billing analysis estimates were largely uncorrelated with National Grid reported savings.
- Variance could be explained by several factors: meter issues, business expansion, operational changes, yearly variations in energy use, data entry errors, TRM assumptions, etc.

Further details and complete findings can be found in the report: *Task 3 Report: Analysis of Utility Bills and Customer Experience Evaluation*.<sup>16</sup>

**Company Response**

The Company carefully reviewed the EM&V legislated study findings and opportunities identified to improve the EM&V process. Tables 4 and 5 provide the Company’s responses regarding incorporation of these opportunities into the current EM&V process for National Grid’s energy efficiency programs.

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<sup>15</sup> <http://www.energy.ri.gov/documents/archived-reports/Task%202%20Report.pdf>

<sup>16</sup> <http://www.energy.ri.gov/documents/archived-reports/Task%203%20Report.pdf>

**Table 4. The Company’s Response to Task 1 Study Recommendations.**

|                 | Opportunities  | National Grid Response   |
|-----------------|--|--|
| <b>Planning</b> | Draft a strategic, preliminary three-year EM&V plan of studies within the three-year Energy Efficiency Plan. Document EM&V expectations for studies (e.g., rigor, confidence and precision, prioritization, funding levels, evaluation level and type within a 3-year cycle). Build from the systems in place (primarily the EM&V study tracker developed by National Grid) to document, at minimum, when the study will be completed and level of effort or rigor (such as through a dollar allocation range). Because this is a strategic plan it should be flexible based on changing needs and priorities. | This will be addressed in the next Three Year Plan. Toward that end, a small project will be undertaken in 2021 to document study expectations such as rigor, precision, etc.  |
|                 | Make sure to build in budget for ad-hoc market or other studies.   | We will continue to build in budget for ad-hoc studies. Placeholders for C&I and Residential ad hoc studies are included in the 2022 Plan. If these funds are unspent in 2022, they will be reallocated to other parts of the program or other programs, or they will result in a rate reduction through the reconciliation adjustment mechanism.  |
|                 | In annual planning, continue to strategically consider high-priority high-impact high-budget needs and, conversely, where less costly approaches can be taken. Not all measures require high-impact approaches (on-site visits).   | For C&I custom studies going forward, National Grid plans to evaluate custom lighting projects at a longer interval, due to the stable realization rate over the last several years. This will reduce high-cost on-site work in an area where it has an undersized impact.<br><br>National Grid will also consider new approaches and sources of information for studying code compliance, such as the use of e-permitting data. |
|                 | When setting EM&V funding, consider reasonableness given Rhode Island’s EM&V rigor standards and the fact that there is active EM&V oversight through the EERMC. Increasing Rhode Island samples and state-specific research may warrant additional EM&V funding as a percentage of implementation and/or additional trade-off analysis between number of studies, rigor, and cost.  | Target budget for 2022 in 3YP is ~40% higher than 2018 budget. Much of this is driven by the increase in state-specific research. National Grid will continue to review planned budgets in the context of research needs.  |



|                       | Opportunities   | National Grid Response  |
|-----------------------|---|---|
| <b>Implementation</b> | Allow sufficient time (from kick off to completion) to complete EM&V studies that require process and impact evaluations and need to be integrated into program planning, recognizing studies take varying amounts of time.   | As of 2020, both residential and C&I sectors have multi-year contracts in place with evaluation vendors, allowing for studies to be planned across multiple years to better accommodate planning deadlines.   |
|                       | Identify strategies to narrow the timeframe between program participation and verification of results for C&I impact evaluations. This may mean any combination of the following: a) more real-time sampling and evaluation, after verification but prior to year-end reporting; b) multi-method EM&V approach, including engineering reviews, focusing on-sites on the highest priority measures where on-sites are warranted. National Grid is currently implementing studies with rolling samples to address this. | In the time since the M&V Legislated Study began, C&I has implemented a rolling sampling process for custom project studies, which has improved the recency of study result application while also allowing for a shift to a RI-only sample for C&I impact evaluations.   |
|                       | Incorporate process-related evaluation activities for all programs at least once a cycle, focusing on areas that could provide the greatest benefit and insight related to program delivery and effectiveness. Continue to build in opportunities for evaluations to provide early insights into new program initiatives, pilots, assessments, demonstrations, and even new elements to existing programs, following strategies outlined in the 2021 Energy Efficiency Plan.  | In the time since the M&V Legislated Study began, a new process for the development and execution of pilots, demonstrations, and assessments has been implemented. This includes designated steps for EM&V involvement, beginning early in the process. C&I has planned a process evaluation to be carried out in 2022. |
|                       | Continue to integrate the EERMC Consultants in critical points of the review process to identify unforeseen issues, receive and discuss their methodological guidance, and gain buy-in on the approach. Critical points include planning, sample planning, and data collection instrumentation.   | National Grid will continue to integrate the EERMC consultants in this process.   |

|                  | Opportunities  | National Grid Response  |
|------------------|--|---|
|                  | Consider closer coordination between the EM&V team and implementation team, whether it be with National Grid implementation staff and/or vendors. Doing so could continue to impress the need for EM&V to effectively inform and integrate into implementation processes and fosters a collaborative relationship to help both parties identify how they can work together to improve energy efficiency program design and implementation. | National Grid will continue to coordinate with implementation while carrying out studies and with vendors to the extent possible while maintaining the objectivity of the evaluation. Toward this goal, National Grid will implement "triangle" meetings between strategy, implementation, and EM&V at a regular cadence for programs where this is not already in place. In early 2022, National Grid EM&V will solicit feedback on 1) the effectiveness of these meetings for each program and needed changes, and 2) other feedback from implementation on strategies for improving coordination. Agenda items for triangle meetings may include: updates on in-progress and future EM&V studies, data tracking issues, programmatic changes, and marketing needs. |
| <b>Reporting</b> | Ensure all reports provide sufficient data to understand confidence, precision, and any caveats related to the representativeness of the population (this is done most of the time, with some minor areas for improvement in residential reporting).   | National Grid will work with vendors to ensure reporting of these statistics. Documentation of EM&V expectations referenced in Planning Opportunity 1 above will guide this work.   |
|                  | Based on Rhode Island’s current structure, recognize and build in sufficient time for at minimum three points of review and feedback including from National Grid staff, the EERMC Consultants, and OER. As a standard practice, integrate results presentations to help make the reporting process more efficient.  | Results presentations may not be necessary for all studies but can be beneficial for particularly impactful or unique studies. National Grid has been working to increase study timelines in recent years in order to accommodate the review process.   |
|                  | Related to stakeholder review process, primarily EERMC Consultant efforts, continue to streamline, coordinate, and synthesize feedback for the evaluation team. Further, attempt to prioritize feedback to methodological and finding-related concerns, recognizing that while feedback is valuable, overly extensive can create delays as the evaluation teams strive to address each comment, big and small.                             | Not applicable to National Grid   |

**Table 5. The Company’s Response to Task 2 Study Recommendations.**

| Recommendations   | National Grid Response  |
|---|---|
| Add applicable C&I prescriptive lighting into future TRMs   | This will be completed in the 2022 TRM.   |
| More carefully consider hours of use assumptions for Upstream Lighting  | HOU assumptions by building type were updated in a 2020 study that was applied beginning in 2021.   |
| Review assumptions used to calculate savings values for LED Screw-In Lamps, to ensure they accurately align with market conditions.       | Assumptions used to calculate savings were updated in a 2020 study that was applied beginning in 2021.  |
| Explore potential adjustments to the steam trap deemed savings value.   | The value used in RI is based on a series of studies in MA, including one that found a previous higher deemed value to be overestimated and another that refined the deemed value into separate high-pressure and low-pressure deemed values. With only one data point outside the MA/RI value, National Grid doesn't believe an update is warranted. |
| Organize the TRM by equipment and measure rather than by program or in another mode that makes the TRM easier for the reader to navigate. | This will not be feasible for the 2022 TRM due to the extensive effort required but will be revisited during the 2023 planning cycle.   |

No formal recommendations were identified from Task 3.



## 2022 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<sup>1</sup> (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 2022 Annual Energy Efficiency 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 2022 Rhode Island Technical Reference Manual, which documents the savings or savings algorithms and costs for measures proposed to be offered through its programs in 2022. 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: 2021 Report” (2021 AESC Study) sponsored by the New England electric and gas efficiency program administrators to be used for cost effectiveness screening in 2021 or later. 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 2021 AESC Study compared to the 2018 iteration of the AESC study.

The 2021 AESC Study introduced four counterfactual scenarios representing variations in demand-side measures offered in the future. For cost-effectiveness screening of the 2022 Rhode Island energy efficiency portfolio the Company used Counterfactual #4 as the best representative scenario for the DSM portfolios in the near future. Counterfactual #4 models a future in which program administrators install no new energy efficiency resources in 2021 or later years. This future does model some amount

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<sup>1</sup> 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](http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf)

of building electrification installed by the program administrators but does not include any active demand management resources installed by the program administrators.<sup>2</sup>

Summarizing from the Executive Summary of the 2021 AESC Study, key differences between the AESC 2018 and AESC 2021 studies are:

- Generally lower avoided costs of energy, due to sustained low natural gas prices at national hubs, lower estimated costs of complying with the Regional Greenhouse Gas Initiative (RGGI), and increased quantities of zero-marginal-cost renewables.
- Generally lower avoided costs of capacity due to a relatively flat supply curve based on observations of recent forward capacity auctions.
- Generally lower avoided costs of natural gas based on lower long-term projections of wholesale natural gas prices. Avoided natural gas costs for retail end-users are also lower than in AESC 2018; but because incremental gas pipeline expansion costs are assumed to be higher, the change in avoided costs at the end-user level is not as large as the reduction in gas commodity prices.
- Generally higher avoided costs for fuel oil and other fuels, due to updates to recent historical data in the underlying sources used to calculate these values.
- Generally higher avoided costs for renewable portfolio standard (RPS) compliance. This is primarily due to recent (or anticipated) increases in RPS target obligations combined with expected increases in load due to electrification.
- Lower energy DRIPE and capacity DRIPE values, due to changes in utility long-term energy purchases, updated market data, and new commodity forecasts. Natural gas DRIPE and oil DRIPE values are also lower due to similar changes.
- Both higher and lower non-embedded costs for environmental regulations that are not otherwise included in the above projections (e.g., carbon dioxide, and nitrogen oxides) depending on the approach used to calculate this number. AESC 2021 presents several different non-embedded costs for use in different state policy contexts.
- Lower avoided costs for pooled transmission facility (PTF) costs, because of a switch to a forward-looking methodology (AESC 2018 utilized a historical methodology).  
Generally lower avoided costs for reliability, due to a flatter supply capacity market supply curve. This is despite a higher estimate for value of lost load (VoLL), determined through newly available data sources.”

Further quantitative detail is provided in the Executive Summary of the 2021 AESC Study showing differences between the 2018 and 2021 AESC Studies in ES-Tables 1-4.

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<sup>2</sup> Refer to the 2021 AESC Executive Summary for a descriptions of Counterfactuals #1 – 4 [https://www.synapse-energy.com/sites/default/files/AESC%202021\\_20-068.pdf](https://www.synapse-energy.com/sites/default/files/AESC%202021_20-068.pdf)

## 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 (i.e., outside of the program), 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.<sup>3</sup> The cumulative impact of realization rates and market effects on gross savings is known as net savings.

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
- Demand Reduction Induced Price Effects (DRIPE)
- 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
- 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 2021 AESC Study, Appendix B. The values in the 2021 AESC Study represent wholesale electric energy commodity

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<sup>3</sup> Both free-ridership and spillover have been determined from evaluation, measurement, and verification studies of program participants, non-participants, and other market actors, such as developers and vendors.

costs that are avoided when generators produce less electricity because of energy efficiency.<sup>4</sup> They include pool transmission losses incurred from the generator to the point of delivery to the distribution companies, and the costs of renewable energy credits borne by generators. 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 2021 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 site 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. A factor for wholesale risk premium is also added to capture market risk factors typically recovered by generators in their pricing, which also increases the wholesale 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.<sup>5</sup> The dollar benefits are then grossed up using the appropriate loss factors representing losses from the ISO delivery point to the end use customer.

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<sup>4</sup> 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.

<sup>5</sup> 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 2022 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.

- Summer Peak Energy Benefit (\$) = kWh \* Energy<sub>SummerPk</sub> \* SummerPk\$/kWh<sub>(@Life)</sub> \* (1 + %Losses<sub>SummerPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Summer OffPeak Energy Benefit (\$) = kWh \* Energy%<sub>SummerOffPk</sub> \* SummerOffPk\$/kWh<sub>(@Life)</sub> \* (1 + %Losses<sub>SummerOffPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Winter Peak Energy Benefit (\$) = kWh \* Energy%<sub>WinterPk</sub> \* WinterPk\$/kWh<sub>(@Life)</sub> \* (1 + %Losses<sub>WinterPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Winter OffPeak Energy Benefit (\$) = kWh \* Energy%<sub>WinterOffPk</sub> \* WinterOffPk\$/kWh<sub>(@Life)</sub> \* (1 + %Losses<sub>WinterOffPk-kWh</sub>) \* (1 + Wholesale Risk Premium)

### 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 2021 AESC Study, 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-NE 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, 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 is therefore calculated as:

- Generation Capacity Benefit(\$)= kW<sub>Summer</sub>\*GenerationCapValue\$/kW<sub>(@Life)</sub> \* (1 + %Losses<sub>SummerkW</sub>)

In addition to the traditional valuation of electric generation capacity, for which results are provided in Appendix B, the 2021 AESC study continued the methodology introduced in 2018 AESC for valuing the capacity of short duration measures that are not actively bid in the ISO-NE 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 (e.g. demand response) would not produce any generation capacity benefits in years 1-5 under the traditional capacity modeling methodology.

The 2021 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 several 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 2021 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 because 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, and carried forward to the 2021 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. The calculations of the electric distribution capacity benefits were updated for the 2022 plan using updated inputs to this tool and results in an avoided distribution capacity cost of \$100.02/kW-year in 2021 dollars.

Electric transmission capacity benefits are valued in the RI Test based on the costs of Pool Transmission Facilities (PTF). The 2021 AESC study calculates an avoided cost for PTF of \$87/kW-year in 2021 dollars. In the 2021 AESC Study the estimation of the PTF values was revised to include transmission projects anticipated to occur through 2026, rather than the purely historical analysis of PTF investments as used in the 2018 AESC Study. The Company continues to use the avoided PTF values instead of the avoided cost

of local transmission investments in screening the energy efficiency portfolios. PTF values are sourced from Appendix B.

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 (\$) =  $(kW_{\text{Summer}} * \text{Trans}\$/kW_{(\text{@Life})} * [1 + (\text{Losses}_{\text{SumkWTrans}})])$
- Distribution Benefit (\$) =  $(kW_{\text{Summer}} * \text{Dist}\$/kW_{(\text{@Life})} * [1 + (\text{Losses}_{\text{SumkWDist}})])$

### 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 2021 AESC Study, Appendix C. These costs include commodity, pipeline transportation cost, and retail distribution margin, or delivery charges, that would be avoided by fuels not consumed by end users.

The 2021 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/hot water. 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.
- Residential water heating/residential non-heating. This assumes savings are constant throughout the year and averages monthly natural gas values over 12 months.
- All commercial and industrial. Used for behavioral savings, codes and standards, and custom measures.
- All residential. This is used for behavioral programs.

- All retail end-uses

Using each of these end-use value components as appropriate, the dollar value of fuel benefits is calculated as:

- Natural Gas Benefits (\$) = MMBtu Gas Savings \* (Gas\$/MMBTU<sub>(EndUseCategory,@Life)</sub>)

### 3.5 Delivered Fuel Benefits

Avoided delivered fuel costs (fuel oil or propane) are appropriate for inclusion in the RI Test. When a project in which consumers have invested saves delivered fuel, an avoided resource benefit is created.

Fuel benefits in the RI Test are valued using avoided fuel values from the 2021 AESC Study, Appendix D. The 2021 AESC Study developed estimates of avoided fuel costs for residential distillate fuel oil, commercial distillate fuel oil, commercial residual fuel oil, industrial distillate fuel oil, and industrial residual fuel oil.

Using each of these end-use value components as appropriate, the dollar value of fuel benefits is calculated as:

- Fuel Benefits (\$) = MMBTU\_Fuel Savings \* Fuel\$/MMBTU<sub>(EndUseCategory,@Life)</sub>

### 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 a May 2021 internet survey of rates posted to the Rhode Island PUC website, updated as of September 3, 2020. Average rates were calculated for both residential and commercial and industrial customers and applied as appropriate to the water savings generated by measures.<sup>6</sup>

Water and sewer benefits are counted for all projects, where appropriate, and calculated as follows:

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<sup>6</sup> RI Regulated Water Suppliers – Rates Updated September 3, 2020,  
<http://www.ripuc.ri.gov/utilityinfo/water/residentialgri.html>

- Water and Sewerage Benefits (\$) = Water and/or Sewerage Savings \* Water and/or Sewer \$/Gal<sub>(@Life)</sub>

### 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 2022 Annual Plan for prescriptive measures are documented in the 2022 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<sub>(@Life)</sub>

### 3.8 Price Effects

The Demand-Reduction-Induced Price Effect (DRIFE) 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-NE 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 2022 from the 2021 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 because 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%<sub>SumPk</sub> \* (SummerPkDRIPE\$/kWh<sub>(@Life+ElectricGasDRIPE\$/kWh)</sub> \* (1 + %Losses<sub>SummerPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Summer OffPeak Energy DRIPE Benefit (\$) = kWh \* Energy%<sub>SumOffPk</sub> \* (SumOffPkDRIPE\$/kWh<sub>(@Life+ElectricGasDRIPE\$/kWh)</sub> \* (1 + %Losses<sub>SummerOffPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Winter Peak Energy DRIPE Benefit (\$) = kWh \* Energy%<sub>WinterPk</sub> \* (WinterPkDRIPE\$/kWh<sub>(@Life+ElectricGasDRIPE\$/kWh)</sub> \* (1 + %Losses<sub>WinterPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Winter OffPeak Energy DRIPE Benefit (\$) = kWh \* Energy%<sub>WinOffPk</sub> \* (WinterOffPkDRIPE\$/kWh<sub>(@Life+ElectricGasDRIPE\$/kWh)</sub> \* (1 + %Losses<sub>WinterOffPk-kWh</sub>) \* (1 + Wholesale Risk Premium)
- Generation Capacity DRIPE Benefit(\$) = kW<sub>Summer</sub> \* CapDRIPEValue\$/kW<sub>(@Life)</sub> \* (1 + %Losses<sub>SummerkW</sub>) \* (1 + Wholesale Risk Premium)
- Natural Gas DRIPE Benefit (\$) = MMBTU\_Fuel Savings \* (GasDRIPEValue\$/MMBTU<sub>(@Life)</sub> + GasElectricDRIPE\$/MMBtu)
- Oil DRIPE Benefit (\$) = MMBTU Fuel Savings \* (OilDRIPEValue\$/MMBTU<sub>(@Life)</sub>)



### 3.9 Non-embedded Greenhouse Gas Reduction Benefits

In accordance with Section 1.3(C)(iii) of the LCP Standards and the Docket 4600 Benefit-Cost Framework the RI Test includes the value of non-embedded greenhouse gas (GHG) reductions.

The 2021 AESC Study developed multiple approaches for calculating non-embedded cost of carbon. The four methods for calculating non-embedded cost of carbon are:

- A damage cost approximated by the social cost of carbon (SCC);
- A global marginal abatement cost approach;
- An approach based on New England marginal abatement costs, assuming a cost derived from electric sector technologies, with wind being the marginal abatement technology; and
- An approach based on New England marginal abatement costs, assuming a cost derived from multiple sectors.

Consistent with the approach in the 2020 and 2021 Annual Plans, the Company proposes to apply the New England marginal abatement cost derived from electric sector as the non-embedded cost of carbon. Using the regional marginal abatement cost 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, including the recently-enacted Act on Climate carbon emission reduction goal of net zero by 2050.

The 2021 AESC Study found that the marginal abatement cost derived from electric sector technologies was 75% higher than the corresponding value estimated in the 2018 AESC Study, at approximately \$125/short ton, levelized over a 15-year period. In the 2018 AESC Study, the cost of avoided CO<sub>2</sub> was reported to be \$68 per short ton in 2018 dollars or \$72 per short ton in 2021 dollars. The 2021 AESC Study describes three factors for the increase in this value:

- Access to more cost data specific to U.S. projects in New Jersey, New York, Massachusetts, and Maryland. The previous AESC 2018 report primarily relied upon European prices due to a lack of U.S. data.
- Assumes annual changes in the cost of offshore wind (e.g., costs start relatively high but decline over time). AESC 2018 assumed a single, unchanging cost throughout the study period.
- Projected energy prices are lower in this edition of AESC 2021. This causes the residual cost of offshore wind to be higher, relative to AESC 2018.

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 approximately \$125 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 using the 15-year levelized values of the Non-embedded carbon price and embedded RGGI Compliance Cost is shown below. The resulting \$ non-embedded avoided cost is applied as a benefit in the RI Test in that year.

- Societal Cost (\$123.85) – Embedded RGGI Compliance Cost (\$8.50) = Non-Embedded Cost (\$115.35)

The Company obtained the non-embedded CO<sub>2</sub> values from User Interface file Appendix B of the 2021 AESC Study for electric savings and User Interface file Appendix G for gas savings and oil savings.

### 3.10 Economic Development Benefits (Non-CHP Measures)<sup>7</sup>

In 2022, the Company is modifying the presentation of economic development benefits for the energy efficiency programs in the estimation of the RI Test ratios, given potential uncertainty in the value of economic benefits. This section describes the calculation of economic development benefits, followed by a discussion of the change in presentation for 2022.

The macroeconomic multipliers for the economic growth and job creation benefits of investing in cost-effective energy efficiency are derived from “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.

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<sup>7</sup> This section details the methodology for applying economic benefits to non-CHP measures. Section 13 in this document refers to the application of economic benefits to CHP measures.

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. 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.

Figure 1. Multipliers by Energy Efficiency Program Type

| Program Type                             | GDP/\$ Program Spending |
|--|-------------------------|
| <b>Electric Program</b>                  |                         |
| <i>Residential</i>                       |                         |
| 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                  |
| <i>Commercial and Industrial</i>         |                         |
| Large Commercial New Construction        | \$3.11                  |
| Large Commercial Retrofit                | \$5.80                  |
| Small Business Direct Install            | \$1.97                  |
| <b>Total Electric Portfolio</b>          | <b>\$2.14</b>           |
| <b>Gas Program</b>                       |                         |
| <i>Residential</i>                       |                         |
| 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                  |
| <i>Commercial and Industrial</i>         |                         |
| Large Commercial New Construction        | \$1.42                  |
| Large Commercial Retrofit                | \$2.53                  |
| Small Business Direct Install            | \$1.75                  |
| Commercial & Industrial Multifamily      | \$1.89                  |
| <b>Total Gas Portfolio</b>               | <b>\$1.26</b>           |
| <b>Combined Heat and Power (CHP)</b>     |                         |
| <b>Total CHP Project &lt;3 MW</b>        | <b>\$2.13</b>           |
| <b>Demand Response</b>                   |                         |
| Residential Connected Solutions          | \$0.83                  |
| Commercial Connected Solutions           | \$2.19                  |
| <b>Total Demand Response Portfolio</b>   | <b>\$2.02</b>           |

In program years 2020 and 2021, the Company included these economic benefits in the screening of the energy efficiency programs and portfolios to align with the Docket 4600 Framework. However, during the 2022 planning process, questions were raised by stakeholders, led by the Division of Public Utilities and Carriers, regarding challenges in completely eliminating double counting of benefit streams in the calculation of macroeconomic benefits.

The DPUC, via their consultant Synapse Energy Economics, conducted a benefit cost analysis and assessment of the treatment of macroeconomic benefits of the RI Community Remote Net Metering (CRNM) program in early 2021.<sup>8</sup> This analysis recommended that, due to the challenges of fully separating all benefit streams within macroeconomic benefits from those already included in other benefit categories counted in the RI Test, the results of an economic impact assessment (EIA) should be shown separately from a BCA and that further discussion of the approach to including economic benefits in the RI Test are warranted to refine the estimation of macroeconomic benefits.

In response to this recommendation, for the 2022 Annual Energy Efficiency Plan, the Company shows the primary RI Test results without economic benefits included. Omission of the macroeconomic benefits lowers benefit cost ratios for all programs and the portfolios as a whole. Because this is a conservative approach to addressing potential double counting and likely underestimates cost-effectiveness, a secondary calculation of the RI Test ratio shows results with economic benefits included. The Company applied the Brattle study multipliers at the program level as part of the secondary calculation of the RI Test. While there is some uncertainty in estimating the economic benefits using this method, the economic benefits are non-zero and positive so the calculation of the secondary RI Test has value in providing a directional and magnitude impact of this benefit stream.

### 3.11 Non-embedded NO<sub>x</sub> 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<sub>x</sub>) emission reductions not already embedded in the avoided cost of energy.

NO<sub>x</sub> emissions come from a variety of sources including industrial processes and the combustion of natural gas for electric generation and heating systems. NO<sub>x</sub> 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<sub>x</sub> emissions, an avoided resource benefit is created.

The 2021 AESC Study utilizes published averages for the continental United States to develop a non-location specific, non-embedded NO<sub>x</sub> emission cost. The 2021 AESC Study assumes a 90/10 mix of NO and NO<sub>2</sub>, which translates to a price of \$14,700 per short ton of NO<sub>x</sub> at the median value from cited studies. That translates to an avoided cost for NO<sub>x</sub> equal to \$0.77 per MWh.

The Company obtained the non-embedded NO<sub>x</sub> values from Appendix B in the User Interface file for Counterfactual #4 for electricity and Appendix G in the User Interface file for non-electric measures.

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<sup>8</sup> <http://www.ripuc.ri.gov/generalinfo/Synapse-CRNM-Macroeconomic-Report-2021.pdf>

### 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 2021 AESC Study used the following methodology to determine the value of improved reliability. As with the 2018 AESC Study, the 2021 AESC Study in part relied on 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. New to the 2021 AESC Study, an additional study was incorporated into the calculations of lost load. Cambridge Economic Policy Associates released a study in July 2018 entitled “Study on the Estimation of the Value of Lost Load of Electricity Supply in Europe.” This study assessed the VoLL in each European Union country for residential customers and 13 types of non-residential customers. The 2021 AESC Study examined the EU countries’ annual average VoLL for the countries most similar to the New England region on a GDP per capita basis. To develop the estimate of the VoLL in the AESC report, Synapse averaged findings from the LBNL and Cambridge Economic Policy Associates studies together for each category of customer. Then, using share-of-sales data for the residential, small C&I, and large C&I customer segments, Synapse calculate a weighted average VoLL of \$73 per kWh.

The 2021 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 reliability in the following ways:

- Some resources that do not clear ISO New England’s Forward Capacity Auction (FCA) will continue to operate as energy-only resources, adding to available reserves. While not obligated to do so, these resources are likely to operate at times of tight supply and high energy prices. They may also be available to assume the capacity obligations of resources that unexpectedly retire or otherwise become unavailable.
- Not all energy efficiency load reductions will clear in the capacity market or immediately affect the load forecast used to determine the amount of capacity acquired. Those load reductions will increase reserve margins.
- The operation of the ISO New England capacity market increases the amount of capacity acquired as the price falls. To the extent that energy efficiency programs reduce the capacity clearing price, reserve margins and reliability will increase.

The 2021 AESC Study calculated cleared reliability benefits in \$/kW-month by calculating the product of (a) the change in MWh of reliability benefits per megawatt of reserve, (b) the net increase in cleared

supply, (c) the decay effect, and (d) the VoLL.<sup>9</sup> Uncleared reliability benefit in \$/kW-month is calculated as the product of (a) the change in MWh of reliability benefits per megawatt of reserve, (b) one plus the reserve margin, (c) the load forecast effect, (c) the decay effect, and (e) the VoLL.

As recommended by the 2021 and 2018 AESC Studies, 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 the 2021 AESC Study to all summer kW savings associated with cleared measures and the Reliability Value of Uncleared EE (\$/kW-year) from the 2021 AESC Study to all summer kW savings associated with uncleared measures. Reliability values are sourced from the AESC User Interface file Appendix B, Counterfactual #4.

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 2021 AESC Study Counterfactual #4 finds that the 15-year levelized benefit of increasing generation reserves through reduced energy usage is \$0.49/kW-year for cleared resources.

- Wholesale Reliability Value Benefit (\$) = kWSummer \* ReliabilityValue\$/kW(@Life) \* (1 + %LossesSummerkW)

### 3.13 Combined Heat and Power 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.<sup>10</sup> 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

As provide by the statute, 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

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<sup>9</sup> Refer to the 2021 AESC Study section 11.2 for additional detail on the derivation of each of these components.

<sup>10</sup> See R.I. Gen.Laws § 39-1-27.7(c) (6) (iii).

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(\$) $\times$  \$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.<sup>11</sup> In this 2022 Plan the Company has conducted a REMI analysis that uses project-specific values for a proposed CHP that meets the 3 MW size threshold. This proposed CHP project is categorized within the electric commercial and industrial new construction program. The economic benefits from this analysis are added to the economic benefits for the C&I New Construction program derived from all other measures in this program to arrive at the total C&I New Construction program benefits.

#### 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 SO<sub>x</sub>, NO<sub>x</sub>, and CO<sub>2</sub>. 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<sub>2</sub> emission reductions and NO<sub>x</sub> reductions will be calculated consistent with sections 9 and 11 above.

#### System Reliability

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<sup>11</sup> In the 2022 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.



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.<sup>12</sup> 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;<sup>13</sup>
- 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.<sup>14</sup>

### 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:

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<sup>12</sup> 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.

<sup>13</sup>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 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.

<sup>14</sup> 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.

- 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.<sup>15</sup> For a retrofit project, the customer incentives cover a portion of the full cost of the efficiency project, as it is assumed that the alternative to the project is no customer action. For a failed equipment replacement/renovation/new construction project, these customer incentives cover a portion of the incremental additional costs associated with moving to a higher efficiency item or practice compared to what the customer would have done otherwise.
- Sales, Technical Assistance, and Training (STAT): These costs include the training and education of the trade ally community regarding the company's current energy efficiency programs. Examples of trade allies include but are not limited to: equipment vendors, heating contractors, lead vendors, project expeditors, 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.

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<sup>15</sup> 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.

### 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 determined by calculating whether the ratio of the net present value of the benefits to the net present value of the costs is greater than or equal to 1.

For the 2022 Annual Plan, all costs and benefits will be expressed in constant 2021 dollars. Where escalation of specific avoided cost inputs is needed to produce values in 2021 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 2021 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 2021 dollars, lifetime benefits thus calculated are discounted back to mid-2021 using a real discount rate equal to  $[(1 + \text{Nominal Discount Rate}) / (1 + \text{Inflation})] - 1$ .

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." For the 2022 Annual Plan, the Company modified the approach used to calculate the discount rate. For the 2021 Annual Plan and prior years, the real discount rate was calculated from the twelve-month average of the historic daily real yields from a ten-year United States Treasury note, using the preceding calendar year to determine the twelve-month average. During 2020 Treasury yields exhibited atypical behavior, with several daily yields being less than zero, in part due to the influence of the Covid-19 Pandemic. To account for this, three years of past data (2018 – 2020) were used to

calculate the discount rate and in any case when the daily yield was negative in 2020 the value was set to zero for purposes of the averaging calculation. These calculations resulted in a real discount rate of 0.42% and nominal discount rate of 1.98%. If only observed real yields were used for 2020, a negative real discount rate would have resulted.

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 + Non-embedded NOx Reduction Benefits + Value of Improved Reliability + Economic Development Benefits (treatment as described above)]

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.<sup>16</sup>

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

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<sup>16</sup> 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.

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 2022 Electric Energy Efficiency and Active Demand Response Portfolio

| Category Level     | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                            | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost |
|--------------------|--------|--|--|--|--|-----------------|
| Power System Level | 1      | Energy Supply & Transmission Operating Value of Energy Provided or Saved | Quantified   | \$29,223,599                             | Energy Efficiency Measures: <i>Winter peak electric energy (kWh) savings</i> 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 2021 study.              | Benefit         |
|                    |        |  |  | \$255                                    | Active Demand Response Measures: <i>Winter peak electric energy (kWh) savings</i> 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 2021 study.         | No Value        |
|                    |        |  | Quantified   | \$31,490,444                             | Energy Efficiency Measures: <i>Winter off-peak electric energy (kWh) savings</i> 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 2021 study.      | Benefit         |
|                    |        |  |  | \$146                                    | Active Demand Response Measures: <i>Winter off-peak electric energy (kWh) savings</i> 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 2021 study. | No Value        |
|                    |        |  | Quantified   | \$10,491,205                             | Energy Efficiency Measures: <i>Summer peak electric energy (kWh) savings</i> 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 2021 study.              | Benefit         |
|                    |        |  |  | \$1,824                                  | Active Demand Response Measures: <i>Summer peak electric energy (kWh) savings</i> 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 2021 study.         | Benefit         |
|                    |        |  | Quantified   | \$6,893,706                              | Energy Efficiency Measures: <i>Summer off-peak electric energy (kWh) savings</i> 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 2021 study.      | Benefit         |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                              | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost |
|----------------|--------|--|--|--|--|-----------------|
|                |        |  |  | \$737                                    | Active Demand Response Measures: <i>Summer off-peak electric energy (kWh) savings</i> 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 2021 study. |                 |
|                |        |  | Quantified   | \$5,670,887                              | Energy Efficiency Measures: Value of avoided summer generation capacity benefit is monetized by the AESC 2021 study avoided costs  | Benefit         |
|                |        |  | Quantified   | \$917,020                                | Active Demand Response Measures: Value of avoided summer generation capacity benefit is monetized by the AESC 2021 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 2021 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 Ancillary Services Value                       | Not applicable   | See Notes                                | Not applicable to energy efficiency  | Not Applicable  |
|                | 6      | Utility / Third Party Developer Renewable Energy, Efficiency, or DER costs | Quantified   | \$122,616,460                            | National Grid costs to implement the electric energy efficiency portfolio. Total budget includes costs for Program Planning & Administration; Marketing; Customer Incentives; Sales Technical Assistance and Training; Evaluation & Market Research; Performance Incentive Mechanism     | Cost            |
|                | 7      | Electric Transmission Capacity Costs / Value                               | Quantified   | \$11,981,224                             | Energy Efficiency: Electric transmission capacity benefits are quantified by multiplying a statewide Pooled Transmission Facility (PTF) transmission value from AESC 2021 study by the summer kW saved from efficiency measures  | Benefit         |
|                |        |  |  | \$3,984,180                              | Active Demand Response: Electric transmission capacity benefits are quantified by multiplying a statewide Pooled Transmission Facility (PTF) transmission value from AESC 2021 study by the summer kW saved from active Demand Response measures   | Benefit         |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category   | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes   | Benefit or Cost |
|----------------|--------|---|--|--|---|-----------------|
|                | 8      | Electric transmission infrastructure costs for Site Specific Resources                  | Not applicable   | See Notes                                | Currently no location-specific energy efficiency included, all measures offered across service territory.   | Not Applicable  |
|                | 9      | Net risk benefits to utility system operations (generation, transmission, distribution) | Not Quantified or Qualified                                  | 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    |
|                |        |   |  | \$29,074,197                             | Energy Efficiency measures: Electric Energy (kWh) DRIPE values quantified based on the energy DRIPE values included in the AESC 2021 study. Calculated for each of winter peak, winter off-peak, summer peak, and summer off-peak.  | Benefit         |
|                |        |   | Quantified   | \$190                                    | Demand Response measures: Electric Energy (kWh) DRIPE values quantified based on the energy DRIPE values included in the AESC 2021 study. Calculated for each of winter peak, winter off-peak, summer peak, and summer off-peak.  | Benefit         |
|                | 12     | Energy Demand Reduction Induced Price Effect  | Quantified   | \$9,166,744                              | Energy Efficiency measures: Electric Generation Capacity (kW) DRIPE value quantified by multiplying avoided summer kW by applicable capacity DRIPE values (\$/kW) from the AESC 2021 study.   | Benefit         |
|                |        |   |  | \$3,627,375                              | Demand Response measures: Electric Generation Capacity (kW) DRIPE value quantified by multiplying avoided summer kW by applicable capacity DRIPE values (\$/kW) from the AESC 2021 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 2021 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. | Benefit         |



| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                   | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description   | Description and Notes   | Benefit or Cost |
|----------------|--------|---|--|--|---|-----------------|
|                |        |   | 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 2021 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. | Benefit         |
|                | 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 2021 study and are included in the calculation of the energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"   | Benefit         |
|                | 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 2021 study and are included in the calculation of the energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"   | Benefit         |
|                | 15     | Innovation and Learning by Doing                                | Not Quantified or Qualified                                  | See notes  | 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                                     | Quantified   | \$11,870,760   | 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         |
| \$3,899,484    |        |   |  | 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 |   |                 |
|                | 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    |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                       | Treatment in Benefit-Cost Analysis (Quantified, Not Quantified, or Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost  |         |
|----------------|--------|---|---|--|--|--|---------|
| Customer Level | 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                                | Reduced arrearages; bad debt write-offs; terminations and reconnections; notices; safety related emergency calls; customer calls and collections; and rate discounts are included as NEIs for income eligible programs. Aggregated with other NEIs in row "Program participant / prosumer benefits / costs"  | Benefit  |         |
|                | 21     | Distribution system and customer reliability / resilience impacts   | Quantified  | \$115,640<br>\$1,154,305                 | Value of Improved Reliability benefit calculated based on reliability value from the AESC 2021 study multiplied by the avoided summer kW savings. Applies to both energy efficiency measures and active demand response measures.  | Benefit<br>Benefit   |         |
|                | 22     | Program participant / prosumer benefits / costs                     | Quantified  | \$20,624,570                             | 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   |         |
|                |        |   |   | \$0                                      | Active demand response measures: There is no customer cost for the ConnectedSolutions Active Demand Response program.  | Cost   |         |
|                | 23     | Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water | Quantified  | \$28,980,146                             | 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 2022 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. Includes quantified utility NEIs noted elsewhere in this table, and national security NEI value. | Benefit  |         |
|                |        |   |   | \$1,366,679                              | Energy Efficiency measures: Quantification of Resource Benefits from: Natural Gas, Oil, Propane, Water & Sewage. Natural Gas Benefits are based on Appendix C of the 2021 AESC study, Oil and Propane Benefits are based on Appendix D of the 2021 AESC study, Water & Sewage Benefits are derived from an internet survey of rates posted to the RI PUC website.  | Benefit  |         |
|                |        |   |   |  | \$0  | 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 |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                    | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost                             |
|----------------|--------|--|--|--|--|---|
| Societal Level | 24     | 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 2022 Annual Plan and TRM. See the category "Program participant / prosumer benefits / costs" for these benefits  | Benefit                                     |
|                | 25     | 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                                |
|                | 26     | Non-participant (equity) rate and bill impacts                   | Quantified   | See Notes                                | External to cost effectiveness analysis. 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 2022 Annual Plan   | Benefit (but not included in BCA screening) |
|                | 27     | Greenhouse gas externality costs                                 | Quantified   | \$44,726,807                             | Energy Efficiency measures: Quantified Non-embedded Greenhouse gas reduction benefits obtained from the 2021 AESC Study. Non-embedded CO2 values are sourced from the following tables in the 2021 AESC Study Appendix B for electric savings and Appendix G for gas savings and oil savings.  | Benefit                                     |
|                |        |  |  | \$3,494                                  | Active Demand Response measures: Quantified Non-embedded Greenhouse gas reduction benefits obtained from the 2021 AESC Study. Non-embedded CO2 values are sourced from the following tables in the 2021 AESC Study Appendix B for electric savings and Appendix G for gas savings and oil savings.   | Benefit                                     |
|                | 28     | Criteria air pollutant and other environmental externality costs | Quantified   | \$60,921                                 | Energy Efficiency measures: Quantified Non-embedded NOx reduction benefits obtained from the 2021 AESC Study. Additional research would be required to determine other benefit streams from air pollutants and other environmental externalities   | Benefit                                     |
|                |        |  |  | See Notes                                | Additional research necessary to determine applicability and qualitative/quantitative impacts for cost effectiveness screening of energy efficiency programs.  | Undetermined                                |
|                | 30     | Non-energy costs/benefits: Economic Development                  | Quantified   | \$256,159,702                            | Energy efficiency measures: In 2022 the Company is treating the economic benefits category qualitatively in the primary RI Test and quantitatively in a secondary test. Economic benefits are calculated by multiplying program spending by a set of multipliers calculated in accordance with a methodology developed in the report: "Brattle Group Review of RI Test and Proposed Methodology Final" | Benefit                                     |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category   | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost |
|----------------|--------|---|--|--|--|-----------------|
|                |        |   |  | \$11,101,097                             | Active demand response measures: In 2022 the Company is treating the economic benefits category qualitatively in the primary RI Test and quantitatively in a secondary test. Economic benefits are calculated by multiplying program spending by a set of multipliers calculated in accordance with a methodology developed in the report: "Brattle Group Review of RI Test and Proposed Methodology Final"  | Benefit         |
|                | 31     | 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         |
|                | 32     | Societal Low-Income Impacts   | Not Quantified or Qualified                                  | See Notes                                | Participant Low-Income Benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2022 Annual Plan and TRM. Societal low-income impacts are not included. Participant NEIs are aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.   | Undetermined    |
|                | 33     | Public Health   | Not Quantified or Qualified                                  | See Notes                                | Participant health benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2022 Annual Plan, societal public health benefits are not monetized. Participant NEIs are aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.  | Benefit         |
|                | 34     | National Security and US international influence  | Quantified   | See Notes                                | National Security due to avoided oil imports are monetized for residential and income eligible measures that save oil in accordance with the 2022 Rhode Island TRM. The value of this NEI is aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.   | Benefit         |

Table 2. Alignment of RI Test to Docket 4600 Framework for 2022 Natural Gas Energy Efficiency Portfolio

| Category Level     | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                            | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes   | Benefit or Cost  |                |
|--------------------|--------|--|--|--|---|--|----------------|
| Power System Level | 1      | Energy Supply & Transmission Operating Value of Energy Provided or Saved | Quantified   | \$32,673,794                             | Natural gas energy efficiency measures. Value of natural gas supply monetized by the AESC 2018 study avoided costs. Natural Gas Benefits are based on Appendix C of the 2018 AESC study. Includes avoided cost of delivering gas (retail margin) and the avoided cost of the gas.                                   | Benefit  |                |
|                    |        |  | Quantified   | \$71,166                                 | Energy Efficiency Measures: Winter peak electric energy (kWh) savings associated with natural gas efficiency 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 2021 study.         | Benefit  |                |
|                    |        |  | Quantified   | \$82,126                                 | Energy Efficiency Measures: Winter off-peak electric energy (kWh) savings associated with natural gas efficiency 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 2021 study. | Benefit  |                |
|                    |        |  | Quantified   | \$82,699                                 | Energy Efficiency Measures: Summer peak electric energy (kWh) savings associated with natural gas efficiency 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 2021 study.         | Benefit  |                |
|                    |        |  | Quantified   | \$71,583                                 | Energy Efficiency Measures: Summer off-peak electric energy (kWh) savings associated with natural gas efficiency 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 2021 study. | Benefit  |                |
|                    | 2      |  | Renewable Energy Credit Cost/Value                           | Quantified                               | \$106,406   | Energy Efficiency Measures: Value of avoided summer generation capacity benefit is monetized by the AESC 2021 study avoided costs  | Benefit        |
|                    |        |  |  | 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        |
|                    |        |  |  | Quantified                               | See Notes   | Wholesale Risk Premium is built into the retail costs of electric energy and electric capacity sourced from the AESC 2021 study and used to calculate the benefits of avoided energy and capacity. | Benefit        |
|                    |        |  |  | Quantified                               | See Notes   | Forward capacity avoided costs are included in capacity benefits.  | Benefit        |
|                    |        |  |  | Quantified                               | See Notes   | Not applicable to energy efficiency  | Not Applicable |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category   | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes   | Benefit or Cost |
|----------------|--------|---|--|--|---|-----------------|
|                | 6      | Utility / Third Party Developer Renewable Energy, Efficiency, or DER costs              | Quantified   | \$36,723,364                             | National Grid costs to implement the natural gas energy efficiency portfolio. Total budget includes costs for Program Planning & Administration; Marketing; Customer Incentives; Sales Technical Assistance and Training; Evaluation & Market Research; Performance Incentive Mechanism   | Cost            |
|                | 7      | Electric Transmission Capacity Costs / Value  | Quantified   | \$139,008                                | Energy Efficiency: Electric transmission capacity benefits are quantified by multiplying a statewide Pooled Transmission Facility (PTF) transmission value from AESC 2021 study by the summer kW saved from efficiency measures   | Benefit         |
|                | 8      | Electric transmission infrastructure costs for Site Specific Resources                  | Not applicable   | See Notes                                | Currently no location-specific energy efficiency included, all measures offered across service territory.   | Not Applicable  |
|                | 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 2021 study multiplied by the avoided summer kW savings. 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    |
|                |        |   | Quantified   | \$64,301                                 | Energy Efficiency measures: Electric Energy (kWh) DRIPE values quantified based on the energy DRIPE values included in the AESC 2021 study. Calculated for each of winter peak, winter off-peak, summer peak, and summer off-peak.  | Benefit         |
|                |        |   | Quantified   | \$213,603                                | Energy Efficiency measures: Electric Generation Capacity (kW) DRIPE value quantified by multiplying avoided summer kW by applicable capacity DRIPE values (\$/kW) from the AESC 2021 study.   | Benefit         |
|                | 12     | Energy Demand Reduction Induced Price Effect  | 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 2021 study. These benefits are included in the category "Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water". Natural Gas measures do not have delivered fuel savings, so no value for the natural gas portfolio | Benefit         |
|                |        |   | Quantified   | \$461,611                                | Gas Supply DRIPE monetized by multiplying the gas savings attributable to the electric portfolio measures by applicable avoided cost series from the AESC 2021 study. These benefits are included in the category "Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water".  | Benefit         |
|                | 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 2021 study and are   | Benefit         |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                     | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes   | Benefit or Cost |
|----------------|--------|---|--|--|---|-----------------|
|                |        |   |  |  | included in the calculation of the electric energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"  |                 |
|                | 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 2021 study and are included in the calculation of the electric energy benefits in the category "Energy Supply & Transmission Operating Value of Energy Provided or Saved"                  | Benefit         |
|                | 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. | Undetermined    |
|                | 16     | Distribution capacity costs                                       | Quantified   | \$137,727                                | 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         |
|                | 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 natural gas 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 natural gas 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 natural gas energy efficiency programs.   | Undetermined    |
|                | 20     | Utility low income  | Quantified   | See Notes                                | Reduced arrears; bad debt write-offs; terminations and reconnections; notices; safety related emergency calls; customer calls and collections; and rate discounts are included as NEIs for income eligible programs. Aggregated with other NEIs in row "Program participant / prosumer benefits / costs"                          | Benefit         |
|                | 21     | Distribution system and customer reliability / resilience impacts | Quantified   | \$10,701                                 | Value of Improved Reliability benefit calculated based on reliability value from the AESC 2018 study multiplied by the avoided summer kW savings. Applies to energy efficiency measures.  | Benefit         |
| Customer Level | 22     | Program participant / prosumer benefits / costs                   | Quantified   | \$8,562,749                              | 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            |

| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category                       | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost                             |
|----------------|--------|---|--|--|--|---|
|                |        |   | Quantified   | \$59,170,394                             | 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 2022 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. Includes quantified utility NEIs noted elsewhere in this table, and national security NEI value. | Benefit                                     |
|                | 23     | Participant non-energy costs/benefits: Oil, Gas, Water, Waste Water | Quantified   | \$747,174                                | Energy Efficiency measures: Quantification of Resource Benefits from: Natural Gas, Oil, Propane, Water & Sewage. Natural Gas Benefits are based on Appendix C of the 2021 AESC study, Oil and Propane Benefits are based on Appendix D of the 2021 AESC study, Water & Sewage Benefits are derived from an internet survey of rates posted to the RI PUC website.  | Benefit                                     |
|                | 24     | 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                                     |
|                | 25     | 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                                |
|                | 26     | Non-participant (equity) rate and bill impacts                      | Quantified   | See Notes                                | External to cost effectiveness analysis. 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 2022 Annual Plan   | Benefit (but not included in BCA screening) |
|                | 27     | Greenhouse gas externality costs                                    | Quantified   | \$27,205,242                             | Energy Efficiency measures: Quantified Non-embedded Greenhouse gas reduction benefits obtained from the 2021 AESC Study. Non-embedded CO2 values are sourced from the following tables in the 2021 AESC Study Appendix B for electric savings and Appendix G for gas savings and oil savings.  | Benefit                                     |
| Societal Level | 28     | Criteria air pollutant and other environmental externality costs    | Quantified   | \$2,811,165                              | Quantified Non-embedded NOx reduction benefits obtained from the 2021 AESC Study. Additional research would be required to determine other benefit streams from air pollutants and other environmental externalities   | Benefit                                     |
|                | 29     | 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 natural gas energy efficiency programs.  | Undetermined                                |



| Category Level | Cat. # | Mixed Benefit-Cost, Cost, or Benefit Category   | Treatment in Benefit-Cost Analysis (Quantified, Not Treated) | Present Value or Qualitative Description | Description and Notes  | Benefit or Cost |
|----------------|--------|---|--|--|--|-----------------|
|                | 30     | Non-energy costs/benefits: Economic Development   | Quantified   | \$44,556,429                             | Energy efficiency measures: In 2022 the Company is treating the economic benefits category qualitatively in the primary RI Test and quantitatively in a secondary test. Economic benefits are calculated by multiplying program spending by a set of multipliers calculated in accordance with a methodology developed in the report: "Brattle Group Review of RI Test and Proposed Methodology Final"   | Benefit         |
|                | 31     | Innovation and knowledge spillover (Related to demonstration projects and other RD&D preceding larger scale deployment) | Quantified   | 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         |
|                | 32     | Societal Low-Income Impacts   | Not Quantified or Quantified                                 | See Notes                                | Participant Low-Income Benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2022 Annual Plan and TRM. Societal low-income impacts are not included. Participant NEIs are aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.   | Undetermined    |
|                | 33     | Public Health   | Quantified   | See Notes                                | Participant health benefits are included within the calculation of Non-Energy Impacts as described within the Non-Energy Impacts section of the 2022 Annual Plan, societal public health benefits are not monetized. Participant NEIs are aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.  | Benefit         |
|                | 34     | National Security and US international influence  | Quantified   | See Notes                                | National Security due to avoided oil imports are monetized for residential and income eligible measures that save oil in accordance with the 2022 Rhode Island TRM. The value of this NEI is aggregated with other Non-Energy Impacts and shown in the Program participant / prosumer benefits / costs category.   | Benefit         |



**Table E-1**  
**National Grid**  
**Electric DSM Funding Sources in 2022 by Sector**  
**\$(000)**

|  | <b>Income Eligible Residential</b> | <b>Projections by Sector Non-Income Eligible Residential</b> | <b>Commercial &amp; Industrial</b> | <b>Total</b>         |
|--|------------------------------------|--|------------------------------------|----------------------|
| (1) <b>Projected Budget (from E-2):</b>  | \$17,076.5                         | \$36,266.5   | \$69,273.5                         | \$122,616.5          |
| <b>Sources of Other Funding:</b>   |                                    |  |                                    |                      |
| (2) Projected DSM Commitments at Year-End 2021:  | \$0.0                              | \$0.0  | \$0.0                              | \$0.0                |
| (3) Projected Year-End 2021 Fund Balance and Interest:   | \$0.0                              | (\$7,628.9)  | \$12,579.2                         | \$4,950.3            |
| (4) Projected FCM Net Revenue from ISO-NE:   | \$482.0                            | \$5,723.2  | \$8,130.1                          | \$14,335.3           |
| (5) <b>Total Other Funding:</b>  | <b>\$482.0</b>                     | <b>(\$1,905.7)</b>   | <b>\$20,709.3</b>                  | <b>\$19,285.5</b>    |
| (6) <b>Customer Funding Required:</b>  | <b>\$16,594.5</b>                  | <b>\$38,172.2</b>  | <b>\$48,564.3</b>                  | <b>\$103,330.9</b>   |
| (7) <b>Forecasted kWh Sales:</b>   | <b>246,778,762</b>                 | <b>2,930,118,727</b>   | <b>4,162,361,309</b>               | <b>7,339,258,798</b> |
| (8) Energy Efficiency Program charge per kWh, excluding uncollectible recovery:                  |                                    |  |                                    | <b>\$0.01407</b>     |
| (9) Proposed SRP Opex Factor per kWh, excluding uncollectible recovery:                          |                                    |  |                                    | <u>\$0.00000</u>     |
| (10) Total Proposed Energy Efficiency Charge per kWh, excluding uncollectible recovery:          |                                    |  |                                    | \$0.01407            |
| (11) Currently Effective Uncollectible Rate  |                                    |  |                                    | 1.30%                |
| (12) <b>Proposed Energy Efficiency Program Charge per kWh, including Uncollectible Recovery:</b> |                                    |  |                                    | \$0.01425            |
| (13) Currently Effective Energy Efficiency Program Charge per kwh                                |                                    |  |                                    | <u>\$0.01113</u>     |
| (14) Proposed Adjustment to Reflect Fully Reconciling Funding Mechanism                          |                                    |  |                                    | \$0.00312            |

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 2022.
- (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 November 17, 2021 as proposed in Section 10 of the Plan's Main Text.
- (4) The total projection of FCM revenue is allocated by kWh sales to each sector. FCM Revenue includes an estimated \$250,230 penalty. See prefiled testimony for additional details.
- (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 (12) - Line (13)

**Table E-2  
National Grid  
2022 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        |
|---|-----------------------------------|------------------|---|--|------------------------------|-----------------------------|--------------------|
| <b>Non-Income Eligible Residential</b>            |                                   |                  |   |  |                              |                             |                    |
| Residential New Construction                      | \$91.6                            | \$23.6           | \$800.9   | \$545.5                                | \$79.9                       |                             | \$1,541.5          |
| ENERGY STAR® HVAC                                 | \$95.7                            | \$279.6          | \$3,324.7   | \$524.6                                | \$262.3                      |                             | \$4,486.9          |
| EnergyWise  | \$401.8                           | \$373.6          | \$13,289.6  | \$1,418.5                              | \$282.0                      |                             | \$15,765.6         |
| EnergyWise Multifamily                            | \$100.5                           | \$74.3           | \$2,613.8   | \$441.6                                | \$40.4                       |                             | \$3,270.7          |
| Residential Consumer Products                     | \$83.5                            | \$464.3          | \$1,724.7   | \$542.4                                | \$22.2                       |                             | \$2,837.1          |
| Home Energy Reports                               | \$55.9                            | \$13.1           | \$0.0   | \$2,551.5                              | \$20.8                       |                             | \$2,641.3          |
| Residential ConnectedSolutions                    | \$38.0                            | \$11.3           | \$1,347.1   | \$368.4                                | \$37.4                       |                             | \$1,802.2          |
| 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         | \$33.7                            | \$125.2          | \$96.2  | \$0.0                                  | \$0.0                        |                             | \$255.1            |
| Comprehensive Marketing - Residential             | \$1.3                             | \$356.7          | \$0.0   | \$0.0                                  | \$0.0                        |                             | \$357.9            |
| Residential Performance Incentive                 | \$0.0                             | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        | \$0.0                       | \$0.0              |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$902.1</b>                    | <b>\$1,761.8</b> | <b>\$23,196.9</b>   | <b>\$6,392.5</b>                       | <b>\$744.9</b>               | <b>\$0.0</b>                | <b>\$32,998.3</b>  |
| <b>Income Eligible Residential</b>                |                                   |                  |   |  |                              |                             |                    |
| Single Family - Income Eligible Services          | \$336.0                           | \$135.0          | \$10,756.0  | \$1,965.9                              | \$72.5                       |                             | \$13,265.4         |
| Income Eligible Multifamily                       | \$113.8                           | \$14.1           | \$3,024.0   | \$344.1                                | \$39.8                       |                             | \$3,535.8          |
| Income Eligible Performance Incentive             | \$0.0                             | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        | \$0.0                       | \$0.0              |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$449.8</b>                    | <b>\$149.2</b>   | <b>\$13,780.0</b>   | <b>\$2,310.0</b>                       | <b>\$112.3</b>               | <b>\$0.0</b>                | <b>\$16,801.2</b>  |
| <b>Commercial &amp; Industrial</b>                |                                   |                  |   |  |                              |                             |                    |
| Large Commercial New Construction                 | \$291.9                           | \$306.8          | \$15,809.2  | \$1,560.1                              | \$432.9                      |                             | \$18,400.8         |
| Large Commercial Retrofit                         | \$732.9                           | \$239.5          | \$18,529.5  | \$4,814.15                             | \$816.3                      |                             | \$25,132.4         |
| Small Business Direct Install                     | \$226.1                           | \$244.0          | \$7,937.2   | \$306.0                                | \$256.0                      |                             | \$8,969.4          |
| Commercial ConnectedSolutions                     | \$96.1                            | \$6.8            | \$4,102.6   | \$180.4                                | \$0.0                        |                             | \$4,386.0          |
| Commercial Pilots                                 | \$0.0                             | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        |                             | \$0.0              |
| Community Based Initiatives - C&I                 | \$11.2                            | \$41.7           | \$32.1  | \$0.0                                  | \$0.0                        |                             | \$85.0             |
| Finance Costs                                     | \$0.0                             | \$0.0            | \$2,000.0   | \$0.0                                  | \$0.0                        |                             | \$2,000.0          |
| Commercial Workforce Development                  | \$0.0                             | \$0.0            | \$0.0   | \$157.5                                | \$0.0                        |                             | \$157.5            |
| Commercial & Industrial Performance Incentive     | \$0.0                             | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        | \$5,500.0                   | \$5,500.0          |
| <b>Subtotal - Commercial &amp; Industrial</b>     | <b>\$1,358.3</b>                  | <b>\$838.8</b>   | <b>\$48,410.5</b>   | <b>\$7,018.2</b>                       | <b>\$1,505.2</b>             | <b>\$5,500.0</b>            | <b>\$64,631.0</b>  |
| <b>Regulatory</b>                                 |                                   |                  |   |  |                              |                             |                    |
| OER   | \$1,911.5                         | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        |                             | \$1,911.5          |
| EERMC   | \$1,274.4                         | \$0.0            | \$0.0   | \$0.0                                  | \$0.0                        |                             | \$1,274.4          |
| Rhode Island Infrastructure Bank                  | \$0.0                             | \$0.0            | \$5,000.0   | \$0.0                                  | \$0.0                        |                             | \$5,000.0          |
| <b>Subtotal - Regulatory</b>                      | <b>\$3,185.9</b>                  | <b>\$0.0</b>     | <b>\$5,000.0</b>  | <b>\$0.0</b>                           | <b>\$0.0</b>                 | <b>\$0.0</b>                | <b>\$8,185.9</b>   |
| <b>Grand Total</b>                                | <b>\$5,896.1</b>                  | <b>\$2,749.8</b> | <b>\$90,387.5</b>   | <b>\$15,720.7</b>                      | <b>\$2,362.3</b>             | <b>\$5,500.0</b>            | <b>\$122,616.5</b> |

**Notes:**

- (1) 2022 Large Commercial Retrofit Commitments (\$000):
- (2) For more information on Finance Costs, please refer to Attachment 2, Section 9.
- (3) OER and EERMC total 3.0% of customers' EE Program Charge collected on Table E-1, minus 3%.
- (4) Finance Costs are detailed in Table E-9. Finance Costs include an injection of \$2M into the Large C&I Revolving Loan Fund. Without this injection the Large C&I Revolving Loan Fund is projected to be negative by the end of 2022.
- (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.
- (6) Based on the state's System Reliability and Least Cost procurement statute (amended in 2021), funds transferred to the Rhode Island Infrastructure Bank are now classified under Regulatory costs.

**Table E-3**  
**National Grid**  
**Derivation of the 2022 Spending and Implementation Budgets (\$000)**

|   | <b>Proposed 2022<br/>Budget<br/>From E-2</b> | <b>Commitments</b> | <b>Regulatory Costs</b> | <b>Performance<br/>Incentive</b> | <b>Eligible Sector Spending<br/>Budget for Performance<br/>Incentive on E-8B</b> | <b>Implementation<br/>Expenses for Cost-<br/>Effectiveness on E-5</b> |
|---|--|--------------------|-------------------------|----------------------------------|--|---|
| <b>Non-Income Eligible Residential</b>            |  |                    |                         |                                  |  |   |
| Residential New Construction                      | \$1,541.5                                    |                    |                         |                                  |  | \$1,541.5   |
| ENERGY STAR@ HVAC                                 | \$4,486.9                                    |                    |                         |                                  |  | \$4,486.9   |
| EnergyWise  | \$15,765.6                                   |                    |                         |                                  |  | \$15,765.6  |
| EnergyWise Multifamily                            | \$3,270.7                                    |                    |                         |                                  |  | \$3,270.7   |
| Residential Consumer Products                     | \$2,837.1                                    |                    |                         |                                  |  | \$2,837.1   |
| Home Energy Reports                               | \$2,641.3                                    |                    |                         |                                  |  | \$2,641.3   |
| Residential ConnectedSolutions                    | \$1,802.2                                    |                    |                         |                                  |  | \$1,802.2   |
| Energy Efficiency Education Programs              | \$40.0                                       |                    |                         |                                  |  | \$40.0  |
| Residential Pilots                                | \$0.0  |                    |                         |                                  |  | \$0.0   |
| Community Based Initiatives - Residential         | \$255.1                                      |                    |                         |                                  |  | \$255.1   |
| Comprehensive Marketing - Residential             | \$357.9                                      |                    |                         |                                  |  | \$357.9   |
| Residential Performance Incentive                 | \$0.0  |                    |                         | \$0.0                            |  | \$0.0   |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$32,998.3</b>                            | <b>\$0.0</b>       | <b>\$0.0</b>            | <b>\$0.0</b>                     | <b>\$31,171.3</b>  | <b>\$32,998.3</b>   |
| <b>Income Eligible Residential</b>                |  |                    |                         |                                  |  |   |
| Single Family - Income Eligible Services          | \$13,265.4                                   |                    |                         |                                  |  | \$13,265.4  |
| Income Eligible Multifamily                       | \$3,535.8                                    |                    |                         |                                  |  | \$3,535.8   |
| Income Eligible Performance Incentive             | \$0.0  |                    |                         | \$0.0                            |  | \$0.0   |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$16,801.2</b>                            | <b>\$0.0</b>       | <b>\$0.0</b>            | <b>\$0.0</b>                     | <b>\$16,801.2</b>  | <b>\$16,801.2</b>   |
| <b>Commercial &amp; Industrial</b>                |  |                    |                         |                                  |  |   |
| Large Commercial New Construction                 | \$18,400.8                                   | \$0.0              |                         |                                  |  | \$18,400.8  |
| Large Commercial Retrofit                         | \$25,132.4                                   | \$0.0              |                         |                                  |  | \$25,132.4  |
| Small Business Direct Install                     | \$8,969.4                                    | \$0.0              |                         |                                  |  | \$8,969.4   |
| Commercial ConnectedSolutions                     | \$4,386.0                                    |                    |                         |                                  |  | \$4,386.0   |
| Commercial Pilots                                 | \$0.0  |                    |                         |                                  |  | \$0.0   |
| Community Based Initiatives - C&I                 | \$85.0                                       |                    |                         |                                  |  | \$85.0  |
| Finance Costs                                     | \$2,000.0                                    |                    |                         |                                  |  | \$2,000.0   |
| Commercial Workforce Development                  | \$157.5                                      |                    |                         |                                  |  | \$157.5   |
| Commercial & Industrial Performance Incentive     | \$5,500.0                                    |                    |                         | \$5,500.0                        |  | \$0.0   |
| <b>Subtotal - Commercial &amp; Industrial</b>     | <b>\$64,631.0</b>                            | <b>\$0.0</b>       | <b>\$0.0</b>            | <b>\$5,500.0</b>                 | <b>\$54,714.0</b>  | <b>\$59,131.0</b>   |
| <b>Regulatory</b>                                 |  |                    |                         |                                  |  |   |
| OER   | \$1,911.5                                    |                    | \$1,911.5               |                                  |  | \$1,911.5   |
| EERMC   | \$1,274.4                                    |                    | \$1,274.4               |                                  |  | \$1,274.4   |
| Rhode Island Infrastructure Bank                  | \$5,000.0                                    |                    | \$5,000.0               |                                  |  | \$5,000.0   |
| <b>Subtotal - Regulatory</b>                      | <b>\$8,185.9</b>                             | <b>\$0.0</b>       | <b>\$8,185.9</b>        | <b>\$0.0</b>                     | <b>\$0.0</b>   | <b>\$8,185.9</b>  |
| <b>Grand Total</b>                                | <b>\$122,616.5</b>                           | <b>\$0.0</b>       | <b>\$8,185.9</b>        | <b>\$5,500.0</b>                 | <b>\$102,686.5</b>   | <b>\$117,116.5</b>  |

**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 2022 Budget Compared to Approved 2021 Budget (\$000)**

|   | <b>Proposed Implementation<br/>Budget 2022</b> | <b>Approved<br/>Implementation Budget<br/>2021</b> | <b>Difference</b> |
|---|--|--|-------------------|
| <b>Non-Income Eligible Residential</b>            |  |  |                   |
| Residential New Construction                      | \$1,541.5                                      | \$1,611.3  | -\$69.8           |
| ENERGY STAR® HVAC                                 | \$4,486.9                                      | \$3,487.8  | \$999.1           |
| EnergyWise  | \$15,765.6                                     | \$15,692.2   | \$73.4            |
| EnergyWise Multifamily                            | \$3,270.7                                      | \$2,804.3  | \$466.4           |
| ENERGY STAR® Lighting                             | \$0.0  | \$5,274.8  | -\$5,274.8        |
| Residential Consumer Products                     | \$2,837.1                                      | \$2,681.2  | \$155.9           |
| Home Energy Reports                               | \$2,641.3                                      | \$2,641.7  | -\$0.4            |
| Residential ConnectedSolutions                    | \$1,802.2                                      | \$1,920.5  | -\$118.3          |
| Energy Efficiency Education Programs              | \$40.0   | \$40.0   | \$0.0             |
| Residential Pilots                                | \$0.0  | \$0.0  | \$0.0             |
| Community Based Initiatives - Residential         | \$255.1  | \$226.2  | \$28.9            |
| Comprehensive Marketing - Residential             | \$357.9  | \$332.7  | \$25.2            |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$32,998.3</b>                              | <b>\$36,712.7</b>                                  | <b>-\$3,714.3</b> |
| <b>Income Eligible Residential</b>                |  |  |                   |
| Single Family - Income Eligible Services          | \$13,265.4                                     | \$12,846.1   | \$419.3           |
| Income Eligible Multifamily                       | \$3,535.8                                      | \$3,549.0  | -\$13.2           |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$16,801.2</b>                              | <b>\$16,395.1</b>                                  | <b>\$406.2</b>    |
| <b>Commercial &amp; Industrial</b>                |  |  |                   |
| Large Commercial New Construction                 | \$18,400.8                                     | \$8,188.2  | \$10,212.7        |
| Large Commercial Retrofit                         | \$25,132.4                                     | \$31,565.2   | -\$6,432.9        |
| Small Business Direct Install                     | \$8,969.4                                      | \$8,883.6  | \$85.8            |
| Commercial ConnectedSolutions                     | \$4,386.0                                      | \$2,990.1  | \$1,395.9         |
| Community Based Initiatives - C&I                 | \$85.0   | \$74.5   | \$10.4            |
| Commercial Pilots                                 | \$0.0  | \$0.0  | \$0.0             |
| Finance Costs                                     | \$2,000.0                                      | \$5,000.0  | -\$3,000.0        |
| Commercial Workforce Development                  | \$157.5  | \$0.0  | \$157.5           |
| <b>Subtotal Commercial &amp; Industrial</b>       | <b>\$59,131.0</b>                              | <b>\$56,701.6</b>                                  | <b>\$2,429.4</b>  |
| <b>Regulatory</b>                                 |  |  |                   |
| EERMC   | \$1,274.4                                      | \$738.5  | \$535.9           |
| OER   | \$1,911.5                                      | \$738.5  | \$1,173.0         |
| Rhode Island Infrastructure Bank                  | \$5,000.0                                      | \$0.0  | \$5,000.0         |
| <b>Subtotal Regulatory</b>                        | <b>\$8,185.9</b>                               | <b>\$1,477.0</b>                                   | <b>\$6,708.9</b>  |
| <b>TOTAL IMPLEMENTATION BUDGET</b>                | <b>\$117,116.5</b>                             | <b>\$111,286.3</b>                                 | <b>\$5,830.1</b>  |
| <b>OTHER EXPENSE ITEMS</b>                        |  |  |                   |
| Commitments                                       | \$0.0  | \$0.0  | \$0.0             |
| Company Incentive                                 | \$5,500.0                                      | \$5,500.0  | \$0.0             |
| <b>Subtotal - Other Expense Items</b>             | <b>\$5,500.0</b>                               | <b>\$5,500.0</b>                                   | <b>\$0.0</b>      |
| <b>TOTAL BUDGET</b>                               | <b>\$122,616.5</b>                             | <b>\$116,786.3</b>                                 | <b>\$5,830.1</b>  |

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 Energy Star® Lighting program year-over-year decrease is due to the phase out of the program in 2022.
- (4) In large part, the increased budget for the Large Commercial and Industrial New Construction program can be attributed to the proposed 13.3 MW CHP system, which accounts for approximately \$9,200,000 in incentives in the 2022 plan. The HVAC incentive budget also increased by approximately \$700,000 due to a 2,065,000 kWh increase in gross annual savings.
- (5) The Large Commercial Retrofit program decreased primarily due to roughly a \$5,400,000 reduction in lighting incentive due to lower anticipated volume as the market becomes increasingly saturated. The CHP budget also decreased approximately \$500,000 because there was a CHP retrofit in the 2021 plan but not 2022.
- (6) The increase in the 2022 Commercial and Industrial ConnectedSolutions program budget can be attributed to the higher participation in the Daily Dispatch demand response offering. In total, the customer incentive payments represent approximately 98% of the cost associated with this measure.
- (7) The Finance Cost decline is driven by a reallocation of \$5M in RIIB from this line to the RIIB line under regulatory due to the updated the Least Cost Procurement statute (amended in 2021).
- (8) The increase in allocation of funds to the OER is made consistent with the state's System Reliability and Least Cost procurement statute (amended in 2021), which provides that the Commission shall allocate an amount not to exceed three percent (3.0%) from authorized demand-side management gas and electric funds authorized.
- (9) The Rhode Island Infrastructure Bank addition is driven by a reallocation of \$5M from the Finance Cost Line to the Rhode Island Infrastructure Bank line under the regulatory sector to comply with the Least Cost Procurement statute (amended in 2021).

**Table E-5 - Primary  
National Grid  
Calculation of 2022 Program Year Cost-Effectiveness  
All Dollar Values in (\$000)**

|   | RI Test<br>Benefit/<br>Cost <sup>1</sup> | Total<br>Benefit   | Program<br>Implementation<br>Expenses <sup>2</sup> | Customer<br>Contribution | Performance<br>Incentive | ¢/Lifetime<br>kWh |
|---|--|--------------------|--|--------------------------|--------------------------|-------------------|
| <b>Non-Income Eligible Residential</b>          |  |                    |  |                          |                          |                   |
| Residential New Construction                    | 2.03                                     | \$4,232.1          | \$1,541.5  | \$547.2                  |                          | 14.0              |
| ENERGY STAR® HVAC                               | 2.31                                     | \$14,630.8         | \$4,486.9  | \$1,848.5                |                          | 8.2               |
| EnergyWise                                      | 1.02                                     | \$16,626.6         | \$15,765.6   | \$530.6                  |                          | 121.0             |
| EnergyWise Multifamily                          | 1.63                                     | \$6,189.9          | \$3,270.7  | \$532.0                  |                          | 18.3              |
| Home Energy Reports                             | 2.04                                     | \$5,401.4          | \$2,641.3  | \$0.0                    |                          | 9.8               |
| Residential Consumer Products                   | 2.19                                     | \$9,713.3          | \$2,837.1  | \$1,606.6                |                          | 9.3               |
| Residential ConnectedSolutions                  | 1.60                                     | \$2,886.0          | \$1,802.2  | \$0.0                    |                          | N/A               |
| Energy Efficiency Education Programs            |  |                    | \$40.0   |                          |                          |                   |
| Residential Pilots                              |  |                    | \$0.0  |                          |                          |                   |
| Community Based Initiatives - Residential       |  |                    | \$255.1  |                          |                          |                   |
| Comprehensive Marketing - Residential           |  |                    | \$357.9  |                          |                          |                   |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>1.57</b>                              | <b>\$59,680.0</b>  | <b>\$32,998.3</b>                                  | <b>\$5,064.9</b>         | <b>\$0.0</b>             | <b>18.9</b>       |
| <b>Income Eligible Residential</b>              |  |                    |  |                          |                          |                   |
| Single Family - Income Eligible Services        | 1.94                                     | \$25,758.0         | \$13,265.4   | \$0.0                    |                          | 34.4              |
| Income Eligible Multifamily                     | 2.37                                     | \$8,368.1          | \$3,535.8  | \$0.0                    |                          | 14.5              |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>2.03</b>                              | <b>\$34,126.2</b>  | <b>\$16,801.2</b>                                  | <b>\$0.0</b>             | <b>\$0.0</b>             | <b>26.7</b>       |
| <b>Commercial &amp; Industrial</b>              |  |                    |  |                          |                          |                   |
| Large Commercial New Construction               | 1.86                                     | \$44,685.8         | \$18,400.8   | \$5,572.0                |                          | 4.8               |
| Large Commercial Retrofit                       | 2.20                                     | \$72,910.7         | \$25,132.4   | \$8,064.5                |                          | 10.6              |
| Small Business Direct Install                   | 1.16                                     | \$12,596.2         | \$8,969.4  | \$1,923.1                |                          | 16.9              |
| Commercial ConnectedSolutions                   | 2.42                                     | \$10,621.2         | \$4,386.0  | \$0.0                    |                          | N/A               |
| Commercial Pilots                               |  |                    | \$0.0  |                          |                          |                   |
| Community Based Initiatives - C&I               |  |                    | \$85.0   |                          |                          |                   |
| Finance Costs                                   |  |                    | \$2,000.0  |                          |                          |                   |
| Commercial Workforce Development                |  |                    | \$157.5  |                          |                          |                   |
| <b>C&amp;I SUBTOTAL</b>                         | <b>1.76</b>                              | <b>\$140,813.9</b> | <b>\$59,131.0</b>                                  | <b>\$15,559.7</b>        | <b>\$5,500.0</b>         | <b>8.5</b>        |
| <b>Regulatory</b>                               |  |                    |  |                          |                          |                   |
| OER   |  |                    | \$1,911.5  |                          |                          |                   |
| EERMC   |  |                    | \$1,274.4  |                          |                          |                   |
| Rhode Island Infrastructure Bank                |  |                    | \$5,000.0  |                          |                          |                   |
| <b>Regulatory SUBTOTAL</b>                      |  |                    | <b>\$8,185.9</b>                                   |                          |                          |                   |
| <b>TOTAL</b>                                    | <b>1.64</b>                              | <b>\$234,620.1</b> | <b>\$117,116.5</b>                                 | <b>\$20,624.6</b>        | <b>\$5,500.0</b>         | <b>12.0</b>       |

Notes:

- (1) RI Test B/C Test = Total Benefits from Table E-6A / Program Implementation Expenses from Table E-3  
Also includes effects of free-ridership and spillover.
- (2) For Implementation Expenses derivation, see Table E-3.

**Table E-5 - Secondary  
National Grid  
Calculation of 2022 Program Year Cost-Effectiveness with Economic Benefits Included  
All Dollar Values in (\$000)**

|   | RI Test<br>Benefit/<br>Cost <sup>1</sup> | Total<br>Benefit   | Program<br>Implementation<br>Expenses <sup>2</sup> | Customer<br>Contribution | Performance<br>Incentive | ¢/Lifetime<br>kWh |
|---|--|--------------------|--|--------------------------|--------------------------|-------------------|
| <b>Non-Income Eligible Residential</b>          |  |                    |  |                          |                          |                   |
| Residential New Construction                    | 3.06                                     | \$6,390.2          | \$1,541.5  | \$547.2                  |                          | 14.0              |
| ENERGY STAR® HVAC                               | 3.32                                     | \$21,002.1         | \$4,486.9  | \$1,848.5                |                          | 8.2               |
| EnergyWise                                      | 1.92                                     | \$31,288.6         | \$15,765.6   | \$530.6                  |                          | 121.0             |
| EnergyWise Multifamily                          | 2.78                                     | \$10,572.6         | \$3,270.7  | \$532.0                  |                          | 18.3              |
| Home Energy Reports                             | 3.04                                     | \$8,042.7          | \$2,641.3  | \$0.0                    |                          | 9.8               |
| Residential Consumer Products                   | 3.16                                     | \$14,025.7         | \$2,837.1  | \$1,606.6                |                          | 9.3               |
| Residential ConnectedSolutions                  | 2.43                                     | \$4,381.8          | \$1,802.2  | \$0.0                    |                          | N/A               |
| Energy Efficiency Education Programs            |  |                    | \$40.0   |                          |                          |                   |
| Residential Pilots                              |  |                    | \$0.0  |                          |                          |                   |
| Community Based Initiatives - Residential       |  |                    | \$255.1  |                          |                          |                   |
| Comprehensive Marketing - Residential           |  |                    | \$357.9  |                          |                          |                   |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>2.51</b>                              | <b>\$95,703.8</b>  | <b>\$32,998.3</b>                                  | <b>\$5,064.9</b>         | <b>\$0.0</b>             | <b>18.9</b>       |
| <b>Income Eligible Residential</b>              |  |                    |  |                          |                          |                   |
| Single Family - Income Eligible Services        | 2.80                                     | \$37,166.3         | \$13,265.4   | \$0.0                    |                          | 34.4              |
| Income Eligible Multifamily                     | 3.56                                     | \$12,575.8         | \$3,535.8  | \$0.0                    |                          | 14.5              |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>2.96</b>                              | <b>\$49,742.1</b>  | <b>\$16,801.2</b>                                  | <b>\$0.0</b>             | <b>\$0.0</b>             | <b>26.7</b>       |
| <b>Commercial &amp; Industrial</b>              |  |                    |  |                          |                          |                   |
| Large Commercial New Construction               | 3.64                                     | \$87,264.4         | \$18,400.8   | \$5,572.0                |                          | 4.8               |
| Large Commercial Retrofit                       | 6.59                                     | \$218,678.4        | \$25,132.4   | \$8,064.5                |                          | 10.6              |
| Small Business Direct Install                   | 2.78                                     | \$30,265.9         | \$8,969.4  | \$1,923.1                |                          | 16.9              |
| Commercial ConnectedSolutions                   | 4.61                                     | \$20,226.4         | \$4,386.0  | \$0.0                    |                          | N/A               |
| Commercial Pilots                               |  |                    | \$0.0  |                          |                          |                   |
| Community Based Initiatives - C&I               |  |                    | \$85.0   |                          |                          |                   |
| Finance Costs                                   |  |                    | \$2,000.0  |                          |                          |                   |
| Commercial Workforce Development                |  |                    | \$157.5  |                          |                          |                   |
| <b>C&amp;I SUBTOTAL</b>                         | <b>4.44</b>                              | <b>\$356,435.0</b> | <b>\$59,131.0</b>                                  | <b>\$15,559.7</b>        | <b>\$5,500.0</b>         | <b>8.5</b>        |
| <b>Regulatory</b>                               |  |                    |  |                          |                          |                   |
| OER   |  |                    | \$1,911.5  |                          |                          |                   |
| EERMC   |  |                    | \$1,274.4  |                          |                          |                   |
| Rhode Island Infrastructure Bank                |  |                    | \$5,000.0  |                          |                          |                   |
| <b>Regulatory SUBTOTAL</b>                      |  |                    | <b>\$8,185.9</b>                                   |                          |                          |                   |
| <b>TOTAL</b>                                    | <b>3.50</b>                              | <b>\$501,880.9</b> | <b>\$117,116.5</b>                                 | <b>\$20,624.6</b>        | <b>\$5,500.0</b>         | <b>12.0</b>       |

Notes:

- (1) RI Test B/C Test = Total Benefits from Table E-6A including Economic Benefits / Program Implementation Expenses from Table E-3  
Also includes effects of free-ridership and spillover.
- (2) For Implementation Expenses derivation, see Table E-3.



**Table E-5A**  
**National Grid**  
**Calculation of 2022 Program Year Cost-Effectiveness with TRC Test**  
**All Dollar Values in (\$000)**

|   | TRC Benefit/<br>Cost <sup>1</sup> | Total Benefit      | Program Implementation Expenses <sup>2</sup> | Customer Contribution | Performance Incentive | ¢/Lifetime kWh |
|---|-----------------------------------|--------------------|--|-----------------------|-----------------------|----------------|
| <b>Non-Income Eligible Residential</b>          |                                   |                    |  |                       |                       |                |
| Residential New Construction                    | 1.61                              | \$3,371.2          | \$1,541.5                                    | \$547.2               |                       | 14.0           |
| ENERGY STAR® HVAC                               | 1.69                              | \$10,738.0         | \$4,486.9                                    | \$1,848.5             |                       | 8.2            |
| EnergyWise                                      | 0.77                              | \$12,509.7         | \$15,765.6                                   | \$530.6               |                       | 121.0          |
| EnergyWise Multifamily                          | 1.35                              | \$5,142.9          | \$3,270.7                                    | \$532.0               |                       | 18.3           |
| Home Energy Reports                             | 1.38                              | \$3,642.0          | \$2,641.3                                    | \$0.0                 |                       | 9.8            |
| Residential Consumer Products                   | 1.39                              | \$6,187.3          | \$2,837.1                                    | \$1,606.6             |                       | 9.3            |
| Residential ConnectedSolutions                  | 1.60                              | \$2,882.5          | \$1,802.2                                    | \$0.0                 |                       | N/A            |
| Energy Efficiency Education Programs            |                                   |                    | \$40.0                                       |                       |                       | 0.0            |
| Residential Pilots                              |                                   |                    | \$0.0  |                       |                       | 0.0            |
| Community Based Initiatives - Residential       |                                   |                    | \$255.1                                      |                       |                       | 0.0            |
| Comprehensive Marketing - Residential           |                                   |                    | \$357.9                                      |                       |                       | 0.0            |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>1.17</b>                       | <b>\$44,473.6</b>  | <b>\$32,998.3</b>                            | <b>\$5,064.9</b>      | <b>\$0.0</b>          | <b>18.9</b>    |
| <b>Income Eligible Residential</b>              |                                   |                    |  |                       |                       |                |
| Single Family - Income Eligible Services        | 1.66                              | \$22,034.6         | \$13,265.4                                   | \$0.0                 |                       | 34.4           |
| Income Eligible Multifamily                     | 2.03                              | \$7,186.3          | \$3,535.8                                    | \$0.0                 |                       | 14.5           |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>1.74</b>                       | <b>\$29,220.8</b>  | <b>\$16,801.2</b>                            | <b>\$0.0</b>          | <b>\$0.0</b>          | <b>26.7</b>    |
| <b>Commercial &amp; Industrial</b>              |                                   |                    |  |                       |                       |                |
| Large Commercial New Construction               | 1.10                              | \$26,252.5         | \$18,400.8                                   | \$5,572.0             |                       | 4.8            |
| Large Commercial Retrofit                       | 1.74                              | \$57,710.4         | \$25,132.4                                   | \$8,064.5             |                       | 10.6           |
| Small Business Direct Install                   | 0.86                              | \$9,355.6          | \$8,969.4                                    | \$1,923.1             |                       | 16.9           |
| Commercial ConnectedSolutions                   | 2.42                              | \$10,621.2         | \$4,386.0                                    |                       |                       |                |
| Commercial Pilots                               |                                   |                    | \$0.0  |                       |                       |                |
| Community Based Initiatives - C&I               |                                   |                    | \$85.0                                       |                       |                       |                |
| Finance Costs                                   |                                   |                    | \$2,000.0                                    |                       |                       |                |
| Commercial Workforce Development                |                                   |                    | \$157.5                                      |                       |                       |                |
| <b>C&amp;I SUBTOTAL</b>                         | <b>1.30</b>                       | <b>\$103,939.8</b> | <b>\$59,131.0</b>                            | <b>\$15,559.7</b>     | <b>\$5,500.0</b>      | <b>8.5</b>     |
| <b>Regulatory</b>                               |                                   |                    |  |                       |                       |                |
| OER   |                                   |                    | \$1,911.5                                    |                       |                       |                |
| EERMC   |                                   |                    | \$1,274.4                                    |                       |                       |                |
| Rhode Island Infrastructure Bank                |                                   |                    | \$5,000.0                                    |                       |                       |                |
| <b>Regulatory SUBTOTAL</b>                      |                                   |                    | <b>\$8,185.9</b>                             |                       |                       |                |
| <b>TOTAL</b>                                    | <b>1.24</b>                       | <b>\$177,634.2</b> | <b>\$117,116.5</b>                           | <b>\$20,624.6</b>     | <b>\$5,500.0</b>      | <b>12.0</b>    |

(1) TRC B/C Test omits societal benefits that are monetized in the RI Test, including non-embedded emissions (CO2 and Nox), and economic benefits Also includes effects of free-ridership and spillover.

(2) For Implementation Expenses derivation, see Table E-3.



Table E-6A  
National Grid  
Summary of 2022 Impacts by Program (Energy Efficiency Measures)

|   | Load Reduction in kW |               | Electric Energy Savings |                  | Gas Saved      |                  | Oil Saved        |               | Propane Saved  |              | Total Net Savings (Electric, Gas, Oil, Propane) |                  |
|---|----------------------|---------------|-------------------------|------------------|----------------|------------------|------------------|---------------|----------------|--------------|---|------------------|
|   | Summer               | Winter        | MWh                     | MMBtu            | Annual         | Lifetime         | Annual           | Lifetime      | Annual         | Lifetime     | Annual  | Lifetime         |
| <b>Non-Income Eligible Residential</b>          |                      |               |                         |                  |                |                  |                  |               |                |              |   |                  |
| Residential New Construction                    | 74                   | 259           | 867                     | 14,947           | 2,957          | 50,998           | -                | 521           | 13,016         | 1,321        | 33,013  | 4,798            |
| ENERGY STAR® HVAC                               | 240                  | 1,063         | 4,620                   | 77,717           | 15,762         | 265,169          | 6,012            | 4,463         | 67,405         | (33)         | (424)   | 20,587           |
| EnergyWise                                      | 424                  | 506           | 2,789                   | 13,472           | 9,515          | 45,968           | -                | 19,019        | 364,568        | 230          | 3,654   | 28,764           |
| EnergyWise Multifamily                          | 143                  | 350           | 1,424                   | 20,783           | 4,857          | 70,912           | -                | 1,046         | 25,343         | -            | -   | 5,903            |
| Home Energy Reports                             | 3,692                | 5,706         | 26,852                  | 26,852           | 91,619         | 91,619           | -                | -             | -              | -            | -   | 91,619           |
| Residential Consumer Products                   | 1,118                | 826           | 6,885                   | 47,554           | 23,491         | 162,256          | 84               | 1,672         | 85             | 25           | 370   | 23,685           |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>5,691</b>         | <b>8,709</b>  | <b>43,435</b>           | <b>201,325</b>   | <b>148,201</b> | <b>686,921</b>   | <b>478</b>       | <b>25,133</b> | <b>472,014</b> | <b>1,543</b> | <b>36,614</b>                                   | <b>175,356</b>   |
| <b>Income Eligible Residential</b>              |                      |               |                         |                  |                |                  |                  |               |                |              |   |                  |
| Single Family - Income Eligible Services        | 480                  | 501           | 3,314                   | 38,506           | 11,306         | 131,383          | 958              | 11,178        | 214,399        | 63           | 1,121   | 23,505           |
| Income Eligible Multifamily                     | 49                   | 445           | 1,538                   | 24,309           | 5,247          | 82,943           | -                | 1,239         | 25,915         | -            | -   | 6,486            |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>529</b>           | <b>946</b>    | <b>4,851</b>            | <b>62,816</b>    | <b>16,553</b>  | <b>214,327</b>   | <b>958</b>       | <b>12,417</b> | <b>240,314</b> | <b>63</b>    | <b>1,121</b>                                    | <b>29,991</b>    |
| <b>Commercial &amp; Industrial</b>              |                      |               |                         |                  |                |                  |                  |               |                |              |   |                  |
| Large Commercial New Construction               | 1,745                | 1,295         | 28,167                  | 503,905          | 96,106         | 1,719,325        | (97,390)         | -             | -              | -            | -   | (1,285)          |
| Large Commercial Retrofit                       | 8,490                | 7,200         | 41,132                  | 312,931          | 140,342        | 1,067,722        | (34,444)         | -             | -              | -            | -   | 105,899          |
| Small Business Direct Install                   | 904                  | 722           | 9,976                   | 64,394           | 34,037         | 219,711          | (8,030)          | -             | -              | -            | -   | 26,007           |
| <b>C&amp;I SUBTOTAL</b>                         | <b>11,139</b>        | <b>9,216</b>  | <b>79,275</b>           | <b>881,230</b>   | <b>270,485</b> | <b>3,006,758</b> | <b>(139,864)</b> | <b>-</b>      | <b>-</b>       | <b>-</b>     | <b>-</b>  | <b>130,621</b>   |
| <b>TOTAL</b>                                    | <b>17,359</b>        | <b>18,872</b> | <b>127,561</b>          | <b>1,145,371</b> | <b>435,239</b> | <b>3,908,006</b> | <b>(138,428)</b> | <b>37,550</b> | <b>712,329</b> | <b>1,607</b> | <b>37,735</b>                                   | <b>335,967</b>   |
|   |                      |               |                         |                  |                |                  |                  |               |                |              |   | <b>2,470,707</b> |

Notes:  
1) Lifetime savings are equal to annual savings multiplied by the expected life of measures expected to be installed in each program.

**Table E-6B**  
**National Grid**  
**Summary of 2022 Demand Response Benefits and Savings**

|  | Benefits (000's) |                           |                   |                |                |                |             |            |            |            |            |              |            |            | Load Reduction (MW) |             | MWh Saved   |  |
|--|------------------|---------------------------|-------------------|----------------|----------------|----------------|-------------|------------|------------|------------|------------|--------------|------------|------------|---------------------|-------------|-------------|--|
|  | Total            | Total (Economic Excluded) | Capacity          |                |                |                |             | Energy     |            |            |            | Non Electric |            | Societal   |                     | Summer      | Lifetime    |  |
|  |                  |                           | Summer Generation | Capacity DRIPE | Trans          | Dist           | Reliability | Winter     |            | Summer     |            | Non Resource | Carbon     | Economic   |                     |             |             |  |
|  |                  |                           |                   |                |                |                |             | Peak       | Off Peak   | Peak       | Off Peak   |              |            |            |                     |             |             |  |
| <b>Non-Income Eligible Residential</b> | \$4,382          | \$2,884                   | \$976             | \$729          | \$722          | \$214          | \$0         | \$0        | \$0        | \$0        | \$0        | \$0          | \$0        | \$3        | \$1,496             | 7.4         | 59.4        |  |
| Residential Connected                  | \$20,226         | \$10,621                  | \$646             | \$3,207        | \$3,177        | \$941          | \$0         | \$0        | \$0        | \$0        | \$0        | \$0          | \$0        | \$0        | \$9,605             | 32.4        | 0.0         |  |
| <b>Commercial &amp; Industrial</b>     |                  |                           |                   |                |                |                |             |            |            |            |            |              |            |            |                     |             |             |  |
| Commercial Connected                   |                  |                           | \$884             | \$3,627        | \$3,899        | \$1,154        | \$0         | \$0        | \$0        | \$0        | \$0        | \$0          | \$0        | \$3        | \$11,101            | 39.8        | 59.4        |  |
| <b>TOTAL</b>                           | <b>\$24,608</b>  | <b>\$13,505</b>           |                   | <b>\$3,936</b> | <b>\$3,899</b> | <b>\$1,154</b> | <b>\$0</b>  | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b> | <b>\$0</b>   | <b>\$0</b> | <b>\$3</b> | <b>\$11,101</b>     | <b>39.8</b> | <b>59.4</b> |  |

Table E-7  
 National Grid  
 Comparison of 2022 and 2021 Goals and Tracking

|   | Proposed 2022 Goal                     |                             |  | Proposed 2022 Tracking               |   |                          |                                    |                             | Approved 2021                          |                                      |   |                             | Difference                             |                                      |                                   |                             |
|---|--|-----------------------------|--|--------------------------------------|---|--------------------------|------------------------------------|-----------------------------|--|--------------------------------------|---|-----------------------------|--|--------------------------------------|-----------------------------------|-----------------------------|
|   | Lifetime Electric Energy Savings (MWh) | Active Demand Response (kW) |  | Annual Electric Energy Savings (MWh) | Annual Passive Summer Demand Savings (kW) | Lifetime Savings (MMBtu) | Total Net Lifetime Savings (MMBtu) | Planned Unique Participants | Lifetime Electric Energy Savings (MWh) | Annual Electric Energy Savings (MWh) | Annual Passive Summer Demand Savings (kW) | Active Demand Response (kW) | Lifetime Electric Energy Savings (MWh) | Annual Electric Energy Savings (MWh) | Annual Summer Demand Savings (kW) | Active Demand Response (kW) |
| <b>Non-Income Eligible Residential</b>          |  |                             |  |                                      |   |                          |                                    |                             |  |                                      |   |                             |  |                                      |                                   |                             |
| Residential New Construction                    | 14,947                                 |                             |  | 867                                  | 74  | 97,027                   | 462                                |                             | 18,088                                 | 979                                  | 66  |                             | -3,141                                 |                                      |                                   | 8                           |
| ENERGY STAR® HVAC                               | 77,717                                 |                             |  | 4,620                                | 240                                       | 338,161                  | 5,229                              |                             | 51,309                                 | 3,181                                | 204                                       |                             | 26,408                                 | 1,439                                | 36                                |                             |
| EnergyWise                                      | 13,472                                 |                             |  | 2,789                                | 424                                       | 414,190                  | 12,000                             |                             | 14,385                                 | 2,841                                | 445                                       |                             | -913                                   | -52                                  | -20                               |                             |
| EnergyWise Multifamily                          | 20,783                                 |                             |  | 1,424                                | 143                                       | 96,255                   | 3,600                              |                             | 16,307                                 | 1,240                                | 158                                       |                             | 4,476                                  | 183                                  | -15                               |                             |
| Home Energy Reports                             | 26,852                                 |                             |  | 26,852                               | 3,692                                     | 91,619                   | 323,248                            |                             | 26,852                                 | 26,852                               | 3,692                                     |                             | 0                                      | 0                                    | 0                                 |                             |
| ENERGY STAR® Lighting                           | 0                                      |                             |  | 0                                    | 0   | 0                        | 0                                  |                             | 26,801                                 | 11,533                               | 1,872                                     |                             | -26,801                                | -11,533                              | -1,872                            |                             |
| Residential Consumer Products                   | 47,554                                 |                             |  | 6,885                                | 1,118                                     | 165,981                  | 34,692                             |                             | 38,130                                 | 5,926                                | 1,019                                     |                             | 9,424                                  | 958                                  | 100                               |                             |
| Residential ConnectedSolutions                  |  | 7,365                       |  |                                      |   |                          | 4,178                              |                             |  |                                      |   |                             |  |                                      |                                   | 1,934                       |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>201,325</b>                         | <b>7,365</b>                |  | <b>43,435</b>                        | <b>5,691</b>                              | <b>1,203,233</b>         | <b>383,409</b>                     |                             | <b>191,872</b>                         | <b>52,553</b>                        | <b>7,455</b>                              |                             | <b>9,453</b>                           | <b>-9,118</b>                        | <b>-1,764</b>                     | <b>1,934</b>                |
| <b>Income Eligible Residential</b>              |  |                             |  |                                      |   |                          |                                    |                             |  |                                      |   |                             |  |                                      |                                   |                             |
| Single Family - Income Eligible Services        | 38,506                                 |                             |  | 3,314                                | 480                                       | 358,466                  | 3,583                              |                             | 36,909                                 | 3,120                                | 457                                       |                             | 1,598                                  | 194                                  | 22                                |                             |
| Income Eligible Multifamily                     | 24,309                                 |                             |  | 1,538                                | 49  | 108,858                  | 3,600                              |                             | 22,545                                 | 1,554                                | 70  |                             | 1,764                                  | -16                                  | -21                               |                             |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>62,816</b>                          |                             |  | <b>4,851</b>                         | <b>529</b>                                | <b>467,324</b>           | <b>7,183</b>                       |                             | <b>59,454</b>                          | <b>4,674</b>                         | <b>527</b>                                |                             | <b>3,361</b>                           | <b>177</b>                           | <b>2</b>                          |                             |
| <b>Commercial &amp; Industrial</b>              |  |                             |  |                                      |   |                          |                                    |                             |  |                                      |   |                             |  |                                      |                                   |                             |
| Large Commercial New Construction               | 503,905                                |                             |  | 28,167                               | 1,745                                     | -211,904                 | 96                                 |                             | 189,441                                | 11,837                               | 1,856                                     |                             | 314,465                                | 16,330                               | -111                              |                             |
| Large Commercial Retrofit                       | 312,931                                |                             |  | 41,132                               | 8,490                                     | 840,524                  | 2,239                              |                             | 744,562                                | 59,496                               | 11,648                                    |                             | -431,630                               | -18,364                              | -3,158                            |                             |
| Small Business Direct Install                   | 64,394                                 |                             |  | 9,976                                | 904                                       | 171,528                  | 490                                |                             | 105,134                                | 9,696                                | 1,134                                     |                             | -40,740                                | 280                                  | -230                              |                             |
| Commercial ConnectedSolutions                   | 32,400                                 |                             |  |                                      |   |                          | 180                                |                             |  |                                      |   |                             |  |                                      |                                   | -1,200                      |
| <b>C&amp;I SUBTOTAL</b>                         | <b>881,230</b>                         | <b>32,400</b>               |  | <b>79,275</b>                        | <b>11,139</b>                             | <b>800,149</b>           | <b>3,005</b>                       |                             | <b>1,039,136</b>                       | <b>81,029</b>                        | <b>14,638</b>                             |                             | <b>-157,906</b>                        | <b>-1,754</b>                        | <b>-3,500</b>                     | <b>-1,200</b>               |
| <b>TOTAL</b>                                    | <b>1,145,371</b>                       | <b>39,765</b>               |  | <b>127,561</b>                       | <b>17,359</b>                             | <b>2,470,707</b>         | <b>393,597</b>                     |                             | <b>1,290,462</b>                       | <b>138,256</b>                       | <b>22,621</b>                             |                             | <b>-145,091</b>                        | <b>-10,695</b>                       | <b>-5,262</b>                     | <b>734</b>                  |

Notes:  
 (1) Planned 2022 participation takes into account net-to-gross and estimates unique participation by taking into account 2021 unique customer accounts to savings ratios. Therefore the number of planned 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, Residential Consumer Products and Home Energy Reports, therefore the population reached can be more than 100%.

**Table E-8A  
 National Grid  
 2022 Electric PIM Benefits, Allocations, and Categorization (\$000)**

|   | (1)                              | (2)                              | (3)                              | (4)                              | (5)                              | (6)                              | (7)                              | (8)                              | (9)                              | (10)                             | (11)                             | (12)                 | (13)              | (14)                           | (15)              | (16)              | (17)              | (18)              |    |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------|-------------------|--------------------------------|-------------------|-------------------|-------------------|-------------------|----|
|   | Summer Generation                | Capacity DRPE                    | Capacity Transmission            | Distribution                     | Reliability                      | Winter Peak Energy               | Winter Off Peak Energy           | Summer Peak Energy               | Summer Off Peak Energy           | Electric Energy DRPE             | Utility NEIs Utility NEIs        | Natural Gas and DRPE | Oil and Oil DRPE  | Non Electric Propane and Water | Non Resource      | Carbon            | Societal NOx      | Economic          |    |
| <b>Non-Income Eligible Residential</b>      |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                      |                   |                                |                   |                   |                   |                   |    |
| Energy Efficiency                           | \$48                             | \$43                             | \$94                             | \$92                             | \$1                              | \$369                            | \$485                            | \$144                            | \$110                            | \$389                            | \$0                              | \$0                  | \$224             | \$1,304                        | \$66              | \$832             | \$28              | \$2,188           |    |
| ENERGY STAR® HVAC                           | \$182                            | \$150                            | \$327                            | \$282                            | \$2                              | \$2,208                          | \$2,927                          | \$721                            | \$145                            | \$1,231                          | \$0                              | \$55                 | \$1,249           | \$1,249                        | \$284             | \$3,292           | \$121             | \$6,271           |    |
| EnergyWise                                  | \$188                            | \$162                            | \$290                            | \$288                            | \$2                              | \$265                            | \$273                            | \$178                            | \$157                            | \$514                            | \$0                              | \$0                  | \$8,084           | \$233                          | \$1,295           | \$3,696           | \$458             | \$14,663          |    |
| EnergyWise Multifamily                      | \$94                             | \$79                             | \$182                            | \$180                            | \$1                              | \$595                            | \$742                            | \$106                            | \$89                             | \$640                            | \$0                              | \$0                  | \$632             | \$48                           | \$1,091           | \$1,004           | \$43              | \$4,388           |    |
| Home Energy Reports                         | \$207                            | \$450                            | \$365                            | \$362                            | \$6                              | \$646                            | \$531                            | \$251                            | \$183                            | \$640                            | \$0                              | \$0                  | \$0               | \$0                            | \$0               | \$1,736           | \$23              | \$2,644           |    |
| Residential Consumer Products               | \$335                            | \$719                            | \$732                            | \$745                            | \$9                              | \$933                            | \$981                            | \$482                            | \$482                            | \$1,096                          | \$0                              | \$15                 | \$42              | \$41                           | \$4               | \$2,663           | \$37              | \$4,312           |    |
| <b>Income Eligible Residential SUBTOTAL</b> | \$1,014                          | \$1,612                          | \$2,041                          | \$2,022                          | \$21                             | \$5,178                          | \$5,999                          | \$1,885                          | \$1,210                          | \$5,036                          | \$0                              | \$70                 | \$11,622          | \$1,609                        | \$3,652           | \$13,603          | \$720             | \$34,528          |    |
| <b>Income Eligible Residential</b>          |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                      |                   |                                |                   |                   |                   |                   |    |
| Single Family - Income Eligible Services    | \$275                            | \$253                            | \$541                            | \$536                            | \$3                              | \$874                            | \$967                            | \$410                            | \$423                            | \$801                            | \$273                            | \$77                 | \$5,282           | \$386                          | \$10,955          | \$3,428           | \$295             | \$11,408          |    |
| Income Eligible Multifamily                 | \$22                             | \$19                             | \$43                             | \$43                             | \$0                              | \$789                            | \$1,008                          | \$30                             | \$25                             | \$554                            | \$340                            | \$0                  | \$642             | \$53                           | \$3,618           | \$1,137           | \$45              | \$4,208           |    |
| <b>Income Eligible Residential SUBTOTAL</b> | \$297                            | \$271                            | \$584                            | \$578                            | \$3                              | \$1,663                          | \$1,975                          | \$440                            | \$448                            | \$1,354                          | \$613                            | \$77                 | \$5,924           | \$439                          | \$14,553          | \$4,565           | \$340             | \$15,616          |    |
| <b>Commercial &amp; Industrial</b>          |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                      |                   |                                |                   |                   |                   |                   |    |
| Large Commercial New Construction           | \$1,336                          | \$1,155                          | \$2,616                          | \$2,592                          | \$14                             | \$14,394                         | \$17,982                         | \$3,158                          | \$1,916                          | \$10,681                         | \$0                              | -\$16,122            | \$0               | \$4                            | -\$2,160          | -\$8,198          | -\$1,080          | \$42,579          |    |
| Large Commercial Retrofit                   | \$2,776                          | \$5,530                          | \$6,172                          | \$6,115                          | \$69                             | \$6,592                          | \$4,738                          | \$4,490                          | \$2,800                          | \$9,914                          | \$0                              | -\$1,887             | \$0               | \$30                           | \$10,381          | -\$15,134         | \$67              | \$145,768         |    |
| Small Business Direct Install               | \$288                            | \$589                            | \$569                            | \$564                            | \$7                              | \$1,395                          | \$807                            | \$1,018                          | \$519                            | \$2,089                          | \$0                              | -\$400               | \$0               | \$0                            | \$1,942           | \$3,226           | \$14              | \$17,670          |    |
| <b>Commercial &amp; Industrial SUBTOTAL</b> | \$4,399                          | \$7,274                          | \$9,357                          | \$9,271                          | \$91                             | \$22,383                         | \$23,516                         | \$8,666                          | \$5,235                          | \$22,683                         | \$0                              | -\$18,410            | \$0               | \$34                           | \$10,162          | -\$26,558         | -\$999            | \$296,016         |    |
| Included in PIM7 (V/S)                      | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                                | Y                    | Y                 | Y                              | N                 | N                 | N                 | N                 |    |
| Percent Application in PIM                  | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 100%                             | 50%                  | 50%               | 50%                            | 0%                | 0%                | 0%                | 0%                |    |
| Category                                    | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Electric Utility System Benefits | Resource Benefits    | Resource Benefits | Resource Benefits              | Resource Benefits | Resource Benefits | Resource Benefits | Resource Benefits | NA |

Notes  
 PIM01/202 Benefit-Cost Model, reflects benefits in Table E-6

**Table E-8B**  
**National Grid**  
**2022 Electric PIM Costs**

|   | (1)                                     | (2)              | (3)                              |
|---|---|------------------|----------------------------------|
|   | Costs (\$)                              |                  |                                  |
|   | Eligible Spending Budget from Table E-3 | Regulatory Costs | Total Costs for PIM Calculations |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | \$31,171,270                            | \$2,728,639      | \$33,899,909                     |
| <b>Income Eligible Residential SUBTOTAL</b>     | \$16,801,227                            | \$2,728,639      | \$19,529,866                     |
| <b>C&amp;I SUBTOTAL</b>                         | \$54,713,968                            | \$2,728,639      | \$57,442,607                     |
| Included in PIM? (Y/N)                          | Y                                       | Y                | Y                                |

**Notes**

Source is Table E-2 and E-3. Regulatory costs allocated equally to each sector.

Table E-8C  
 National Grid  
 2022 Electric PIM and SQA

| Sector                          | Planned Eligible Benefits             |                       | Planned Eligible Costs                      | Planned Eligible Net Benefits (d) | Design Performance Achievement                          | Design Performance Payout | Design Payout Rate | Design Payout Rate Thresholds   | Payout Rate Adjustments   | Payout Cap  | Service Quality Metric        |
|---------------------------------|---------------------------------------|-----------------------|---|-----------------------------------|---|---------------------------|--------------------|---|---|-------------|-------------------------------|
|                                 | (a)                                   | (b)                   |   |                                   |   |                           |                    |   |   |             |                               |
|                                 | 100% Electric Utility System Benefits | 50% Resource Benefits | Eligible Spending Budget + Regulatory Costs | $=(a)-(b)-(c)$                    | Net benefits at which design incentive pool is achieved | Set by PUC                | $=f/(g)$           | Achievement levels at which the Payout Rate Adjustments in (i) will be applied—Set by PUC   | Factor to adjust Design Payout Rate for if final program achievement fall within the ranges in (b)—Set by PUC | $=1.25*(f)$ | Yes if (d) ≤ 0; No if (d) > 0 |
| Non-Income Eligible Residential | \$25,517,341                          | \$6,650,701           | \$33,899,909                                | -\$1,731,867                      | \$2,000,000   | \$500,000                 | 25%                | a. Achievement < 25%<br>b. 25% ≤ Achievement < 50%<br>c. 50% ≤ Achievement < 75%<br>d. 75% ≤ Achievement<br>* Spending > Planned Eligible Costs | a. 0.0<br>b. Achievement/100 + 0.1<br>c. Achievement/100 + 0.25<br>d. 1.0<br>* See Boundary Rules             | \$625,000   | Yes                           |
| Income Eligible Residential     | \$8,227,538                           | \$3,220,366           | \$19,529,866                                | -\$8,081,961                      | \$2,000,000   | \$500,000                 | 25%                |   |   | \$625,000   | Yes                           |
| Commercial & Industrial         | \$112,846,400                         | \$9,187,728           | \$57,442,607                                | \$46,216,065                      | \$46,216,065  | \$5,500,000               | 12%                |   |   | \$6,875,000 | No                            |

Sector PI = min( Payout Cap(i), Actual Net Benefits\* Design Payout Rate(g) + Payout Rate Adjustment(i) )

Sector SOA = Maximum Service Adjustment(e) + Service Achievement Scaling Factor(g)

| Sector                          | Planned Eligible Benefits             |                       | Planned Eligible Costs                      | Design Service Achievement | Maximum Service Adjustment                                 | Service Adjustment Thresholds  | Service Achievement Scaling Factors   | Achievement Cost Adjustment  |
|---------------------------------|---------------------------------------|-----------------------|---|----------------------------|--|--|---|--|
|                                 | (a)                                   | (b)                   |   |                            |  |  |   |  |
|                                 | 100% Electric Utility System Benefits | 50% Resource Benefits | Eligible Spending Budget + Regulatory Costs | $=(a)-(b)$                 | Maximum downward adjustment to earned incentive—Set by PUC | Adjusted Achievement levels at which the Service Adjustments in (e) will be applied; adjustment is calculated in (h) | Factor to scale program achievement that fall within the ranges in (f)  | Actual-cost-based adjustment factor applied to achievement. Result is if the difference between achievement and cost variances are greater than 5%, the Actual Achievement will be adjusted for use in |
| Non-Income Eligible Residential | \$25,517,341                          | \$6,650,701           | \$33,899,909                                | \$32,168,042               | \$1,251,250  | a. Adjusted Achievement < 65%<br>b. 65% ≤ Adjusted Achievement < 95%<br>c. 95% ≤ Adjusted Achievement                | Performance Variance = "Actual Benefits" / "Design Achievement" - "Spending" / "Planned Eligible Cost"<br>If the absolute value (Performance Variance) ≤ 0.05, then Adjusted Achievement = Actual Achievement<br>Else Adjusted Achievement = Actual Achievement * (1+ Performance Variance) |  |
| Income Eligible Residential     | \$8,227,538                           | \$3,220,366           | \$19,529,866                                | \$11,447,904               | \$715,000  |  |   |  |
| Commercial & Industrial         | \$112,846,400                         | \$9,187,728           | \$57,442,607                                | N/A                        | N/A  |  |   |  |



**Table E-9  
National Grid  
Revolving Loan Fund Projections**

| <b>Large C&amp;I Revolving Loan Fund</b>              |                     | <b>Small Business Revolving Loan Fund</b>                 |                     |
|---|---------------------|---|---------------------|
| (1) Total Loan Fund Deposits Through 2021             | \$ 18,547,780       | (1) Total Loan Fund Deposits Through 2021                 | \$ 3,303,570        |
| (2) Current Loan Fund Balance                         | \$ 7,208,593        | (2) Current Loan Fund Balance                             | \$ 2,743,078        |
| <i>Loans Paid Year-To-Date</i>                        | \$ 3,356,693        | <i>Loans Paid Year-To-Date</i>                            | \$ 570,365          |
| <i>Repayments Year-To-Date</i>                        | \$ 2,946,562        | <i>Repayments Year-To-Date</i>                            | \$ 606,588          |
| (3) Projected Additional Loans by Year End 2021       | \$ 5,770,777        | (3) Projected Additional Loans by Year End 2021           | \$ 510,000          |
| (4) Projected Additional Repayments by Year End 2021  | \$ 2,453,636        | (4) Projected Additional Repayments by Year End 2021      | \$ 275,529          |
| <b>(5) Projected Year End Loan Fund Balance 2021</b>  | <b>\$ 3,891,451</b> | <b>(5) Projected Year End Loan Fund Balance 2021</b>      | <b>\$ 2,508,608</b> |
| (6) 2022 Fund Injection                               | \$ 2,000,000        | (6) 2022 Fund Injection                                   | \$ -                |
| <b>(7) Projected Loan Fund Balance, January 2022</b>  | <b>\$ 5,891,451</b> | <b>(7) Projected Loan Fund Balance, January 2022</b>      | <b>\$ 2,508,608</b> |
| (8) Projected Repayments throughout 2022              | \$ 3,881,906        | (8) Projected Repayments throughout 2022                  | \$ 245,746          |
| (9) Estimated Loans in 2022                           | \$ 8,928,261        | <b>(9) Estimated Loans in 2022</b>                        | <b>\$ 1,500,000</b> |
| <b>(10) Projected Year End Loan Fund Balance 2022</b> | <b>\$ 845,095</b>   | <b>(10) Projected Year End Loan Fund Balance 2022</b>     | <b>\$ 1,254,353</b> |
| <b>Public Sector Revolving Loan Fund</b>              |                     | <b>Efficient Buildings Fund</b>                           |                     |
| (1) Total Loan Fund Deposits Through 2021             | \$ 54,065           | (1) Energy Efficiency Funds allocated to EBF through 2021 | \$ 27,087,113       |
| (2) Current Loan Fund Balance                         | \$ 34,124           | (2) Total EBF Loans Outstanding                           | \$ 55,075,045       |
| <i>Funds returned to OER</i>                          | \$ -                |   |                     |
| <i>Repayments Year-To-Date</i>                        | \$ 34,052           |   |                     |
| (3) Projected Additional Loans by Year End            | \$ -                |   |                     |
| (4) Projected Additional Repayments by Year End       | \$ 15,523           |   |                     |
| <b>(5) Projected Year End Loan Fund Balance 2021</b>  | <b>\$ 49,647</b>    |   |                     |
| (6) 2022 Fund Injection                               | \$ -                |   |                     |
| <b>(7) Projected Loan Fund Balance, January 2022</b>  | <b>\$ 49,647</b>    |   |                     |
| (8) Projected Repayments throughout 2022              | \$ 2,945            |   |                     |
| (9) Estimated Loans in 2022                           | \$ -                |   |                     |
| <b>(10) Projected Year End Loan Fund Balance 2022</b> | <b>\$ 52,592</b>    |   |                     |

Notes

- 1 Funding injections since loan funds began. Net of any adjustments.
- 2 Current Loan Fund Balance is through July 2021; it includes all loans and repayments made by July 2021. Public Sector Revolving Loan Fund reduced by transfers to RI PEP Incentives. EBF reports in terms of loans outstanding.
- 3 Projected Loans from July to Year-End 2021 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 2022 instead of 2021.
- 4 Projected Repayments from June to Year-End 2021 is estimated based on the monthly average amount of repayments.
- 5 Equal to (2) - (3) + (4).
- 6 Fund injection of \$2M for the Large C&I Revolving Loan Fund is included under the Finance Cost line in table E-2.
- 7 Equal to (5) + (6).
- 8 Assumption based on monthly average repayments in 2021 over 12 month period; repayments accumulate over time and may vary widely.
- 9 Amount projected to be lent to customers in 2022
- 10 Equal to (7) + (8) - (9).
- Efficient Buildings Fund - The 2022 Annual Plan only includes two values for EBF: 1) The Energy Efficiency Funds allocated to EBF through 2021 and also assumes that the \$5M allocated to EBF for 2021 will be transferred to RIIB in 2021. 2) Total EBF Loans Outstanding as of July 2021. Additional information is not available because RIIB has informed the Company that, commencing with the 2022 Plan, it will not be providing forward looking projections to the Company regarding EBF. The Company is therefore unable to provide any future projections in the 2022 Annual Plan regarding EBF. The state's System Reliability and Least Cost procurement statute (amended in 2021) directs that \$5M shall be transferred to RIIB. However, RIIB has not informed the Company the statutory \$5M transfer to RIIB in 2022 will go to EBF.

Table E-10  
National Grid  
Rhode Island Electric Energy Efficiency 2003 - 2022  
\$(000)

| Electric   | 2003      | 2004      | 2005      | 2006      | 2007      | 2008      | 2009        | 2010        | 2011        | 2012        | 2013 <sup>(6)</sup> | 2014        | 2015        | 2016        | 2017        | 2018        | 2019        | 2020 <sup>(5)</sup> | 2021 <sup>(6)</sup> | 2022 <sup>(5)</sup> |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|-------------|-------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------|---------------------|---------------------|
| Energy Efficiency Budget (\$Million) <sup>(1)</sup>                      | \$21.1    | \$22.4    | \$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             | \$116.8             | \$122.6             |
| Spending Budget (\$Million) <sup>(2)</sup>                               | \$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             | \$104.8             | \$102.7             |
| Actual Expenditures (\$Million) <sup>(3)</sup>                           | \$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      | \$95.0      | \$100.7     | \$88.2              | \$96.0              | \$102.7             |
| Incentive Percentage <sup>(4)</sup>                                      | 4.4%      | 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%                | 5.0%                |
| Target Incentive <sup>(5)</sup>  | \$712,557 | \$781,959 | \$774,689 | \$726,627 | \$725,000 | \$667,689 | \$1,035,943 | \$1,267,043 | \$1,992,513 | \$2,334,131 | \$3,240,747         | \$4,032,000 | \$3,867,400 | \$3,878,087 | \$4,425,528 | \$4,436,022 | \$4,905,009 | \$5,094,448         | \$5,590,000         | \$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 | \$5,290,237 | \$5,242,675         | \$5,791,798         | \$5,242,675         |
| Annual Summer Demand kW Savings Goal Achieved (%)                        |           |           |           | 106%      | 106%      | 113%      | 142%        | 78%         | 71%         | 83%         | 114%                | 78%         | 112%        | 101%        | 103%        | 116%        | 98%         | 79%                 | 88%                 | 88%                 |
| Annual MWh Energy Savings Goal Achieved (%)                              |           |           |           | 111%      | 102%      | 111%      | 115%        | 107%        | 94%         | 93%         | 99%                 | 105%        | 115%        | 107%        | 115%        | 110%        | 98%         | 98%                 | 88%                 | 88%                 |
| Energy Efficiency Program Charge (\$/kWh) <sup>(7)</sup>                 | \$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   | \$0.01121           | \$0.01323           | \$0.01113           |
| Annual Cost to 500 kWh/month Residential Customer w/o tax <sup>(8)</sup> | \$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             | \$66.78             | \$85.50             |
| Annual Cost to 500 kWh/month Residential Customer w tax <sup>(9)</sup>   | \$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             | \$69.56             | \$89.06             |

**Notes:**  
(1) Energy Efficiency Budget includes total expenditures and commitments, 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, Copyys, and Outside Finance Costs. Beginning in 2017, Outside Finance Costs were also included. Beginning in 2019, Contractual Expenses were also included.  
(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 uncollectible 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) 2021 values are planned.  
(6) 2022 values are proposed.  
(7) Beginning in 2012, the EE Program Charge includes the System Reliability Factor. It does not include the \$0.00003 renewables per RI General Laws §39-21.2 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 11 of the Main Text of the 2022 Annual Plan for additional details.  
(11) Target incentive is calculated in the same way as in 2021 in order to provide a more accurate estimate of the energy efficiency surcharge.



**Table G-1  
National Grid  
Gas DSM Funding Sources in 2022 by Sector  
\$(000)**

|  | <u>Projections by Sector</u>       |  |                                    | <b>Total</b>       |
|--|------------------------------------|--|------------------------------------|--------------------|
|  | <b>Income Eligible Residential</b> | <b>Non-Income Eligible Residential</b> | <b>Commercial &amp; Industrial</b> |                    |
| <b>(1) Projected Budget (from G-2):</b>  | <b>\$9,370.3</b>                   | <b>\$15,531.0</b>                      | <b>\$11,822.0</b>                  | <b>\$36,723.4</b>  |
| <b>Sources of Other Funding:</b>   |                                    |  |                                    |                    |
| (2) Projected Year-End 2021 Fund Balance and Interest:   | \$0.0                              | (\$7,849.6)                            | \$2,773.5                          | (\$5,076.1)        |
| <b>(3) Total Other Funding:</b>  | <b>\$0.0</b>                       | <b>(\$7,849.6)</b>                     | <b>\$2,773.5</b>                   | <b>(\$5,076.1)</b> |
| <b>(4) Customer Funding Required:</b>  | <b>\$9,370.3</b>                   | <b>\$23,380.6</b>                      | <b>\$9,048.6</b>                   | <b>\$41,799.5</b>  |
| (5) Forecasted Firm Dth Volume   | 1,685,277                          | 18,876,534                             | 19,843,867                         | 40,405,678         |
| (6) Forecasted Non Firm Dth Volume   |                                    |  | 2,278,545                          | 2,278,545          |
| (7) Less: Exempt DG Customers  |                                    |  | (1,244,516)                        | (1,244,516)        |
| <b>(8) Forecasted Dth Volume:</b>  | <b>1,685,277</b>                   | <b>18,876,534</b>                      | <b>20,877,896</b>                  | <b>41,439,707</b>  |
| Average Energy Efficiency Program Charge per Dth   |                                    |  |                                    |                    |
| (9) excluding Uncollectible Recovery:  |                                    |  |                                    | \$1.008            |
| (10) Proposed Energy Efficiency Program Charge per Dth excluding Uncollectible Recovery          | \$1.198                            | \$1.198                                | \$0.821                            |                    |
| (11) Currently Effective Uncollectible Rate  | <u>1.91%</u>                       | <u>1.91%</u>                           | <u>1.91%</u>                       |                    |
| <b>(12) Proposed Energy Efficiency Program Charge per Dth, including Uncollectible Recovery:</b> | <b>\$1.221</b>                     | <b>\$1.221</b>                         | <b>\$0.836</b>                     |                    |
| (13) Currently Effective Energy Efficiency Program Charge per Dth                                | \$0.871                            | \$0.871                                | \$0.596                            |                    |
| (14) Adjustment to Reflect Fully Reconciling Funding Mechanism                                   | \$0.350                            | \$0.350                                | \$0.240                            |                    |

**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 2022 EE Plan Table G-1. The Company proposes to refile this table with updated Fund Balance projections on November 17, 2021 as proposed in Section 10 of the Plan's Main Text.  
(10) 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 \$7.64 million of which \$4.17 million will be allocated to the low income sector and \$3.47 million to the residential sector.  
(11) Uncollectible rate approved in Docket No. 4770.

**Table G-2  
National Grid  
2022 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       |
|---|-------------------------------------|----------------|---|--|------------------------------|-----------------------|-------------------|
| <b>Non-Income Eligible Residential:</b>           |                                     |                |   |  |                              |                       |                   |
| ENERGY STAR® HVAC                                 | \$113.6                             | \$206.9        | \$3,058.9   | \$238.7                                  | \$114.4                      | \$0.0                 | \$3,732.5         |
| EnergyWise  | \$199.9                             | \$71.1         | \$7,037.7   | \$1,173.3                                | \$163.9                      | \$0.0                 | \$8,645.9         |
| EnergyWise Multifamily                            | \$48.4                              | \$55.5         | \$1,216.0   | \$154.3                                  | \$14.9                       | \$0.0                 | \$1,489.2         |
| Home Energy Reports                               | \$9.7                               | \$0.0          | \$0.0   | \$429.1                                  | \$3.0                        | \$0.0                 | \$441.8           |
| Residential Pilots                                | \$0.0                               | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$0.0             |
| Residential New Construction                      | \$30.2                              | \$2.1          | \$332.2   | \$115.2                                  | \$33.5                       | \$0.0                 | \$513.2           |
| Comprehensive Marketing - Residential             | \$0.1                               | \$68.0         | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$68.0            |
| Community Based Initiatives - Residential         | \$11.2                              | \$41.7         | \$32.1  | \$0.0                                    | \$0.0                        | \$0.0                 | \$85.0            |
| Residential Performance Incentive                 | \$0.0                               | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$0.0             |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$413.0</b>                      | <b>\$445.2</b> | <b>\$11,676.8</b>   | <b>\$2,110.6</b>                         | <b>\$329.8</b>               | <b>\$0.0</b>          | <b>\$14,975.5</b> |
| <b>Income Eligible Residential:</b>               |                                     |                |   |  |                              |                       |                   |
| Single Family - Income Eligible Services          | \$134.3                             | \$25.0         | \$5,016.4   | \$1,168.8                                | \$27.3                       | \$0.0                 | \$6,371.8         |
| Income Eligible Multifamily                       | \$72.5                              | \$8.4          | \$2,474.5   | \$364.2                                  | \$29.3                       | \$0.0                 | \$2,948.9         |
| Income Eligible Performance Incentive             | \$0.0                               | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$0.0             |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$206.8</b>                      | <b>\$33.4</b>  | <b>\$7,490.9</b>  | <b>\$1,533.0</b>                         | <b>\$56.6</b>                | <b>\$0.0</b>          | <b>\$9,320.7</b>  |
| <b>Commercial &amp; Industrial</b>                |                                     |                |   |  |                              |                       |                   |
| Large Commercial New Construction                 | \$118.5                             | \$152.1        | \$1,636.0   | \$1,063.5                                | \$216.5                      | \$0.0                 | \$3,186.6         |
| Large Commercial Retrofit                         | \$206.4                             | \$261.9        | \$2,543.0   | \$1,535.2                                | \$149.8                      | \$0.0                 | \$4,696.3         |
| Small Business Direct Install                     | \$5.8                               | \$31.1         | \$269.9   | \$44.5                                   | \$4.6                        | \$0.0                 | \$355.9           |
| Commercial & Industrial Multifamily               | \$26.4                              | \$25.9         | \$756.0   | \$142.4                                  | \$6.6                        | \$0.0                 | \$957.3           |
| Commercial Pilots                                 | \$0.0                               | \$7.5          | \$178.3   | \$30.0                                   | \$0.0                        | \$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                 | \$3.7                               | \$13.9         | \$10.7  | \$0.0                                    | \$0.0                        | \$0.0                 | \$28.3            |
| Commercial Workforce Development                  | \$0.0                               | \$0.0          | \$0.0   | \$67.5                                   | \$0.0                        | \$0.0                 | \$67.5            |
| Commercial & Industrial Performance Incentive     | \$0.0                               | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$1,700.0             | \$1,700.0         |
| <b>Subtotal - Commercial &amp; Industrial</b>     | <b>\$360.8</b>                      | <b>\$492.4</b> | <b>\$5,393.9</b>  | <b>\$2,883.2</b>                         | <b>\$377.5</b>               | <b>\$1,700.0</b>      | <b>\$11,207.6</b> |
| <b>Regulatory</b>                                 |                                     |                |   |  |                              |                       |                   |
| EERMC   | \$487.8                             | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$487.8           |
| OER   | \$731.7                             | \$0.0          | \$0.0   | \$0.0                                    | \$0.0                        | \$0.0                 | \$731.7           |
| <b>Subtotal - Regulatory</b>                      | <b>\$1,219.5</b>                    | <b>\$0.0</b>   | <b>\$0.0</b>  | <b>\$0.0</b>                             | <b>\$0.0</b>                 | <b>\$0.0</b>          | <b>\$1,219.5</b>  |
| <b>Grand Total</b>                                | <b>\$2,200.1</b>                    | <b>\$971.0</b> | <b>\$24,561.6</b>   | <b>\$6,526.8</b>                         | <b>\$763.8</b>               | <b>\$1,700.0</b>      | <b>\$36,723.4</b> |

**Notes:**

- (1) OER and EERMC is equal to 3% of total collections from customers' Energy Efficiency Program Charge, reduced by 3%.
- (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 2022 Spending & Implementation Budgets (\$000)**

|   | Proposed 2022<br>Budget From G-2<br>(\$000) | Outside Finance<br>and Stakeholder<br>Oversight Costs<br>(\$000) | Performance<br>Incentive (\$000) | Eligible Sector<br>Spending Budget<br>for Performance<br>Incentive on G-9<br>(\$000) <sup>1</sup> | Implementation<br>Expenses for<br>Cost-Effectiveness<br>on G-5<br>(\$000) <sup>2</sup> |
|---|---|--|----------------------------------|---|--|
| <b>Non-Income Eligible Residential</b>            |   |  |                                  |   |  |
| ENERGY STAR® HVAC                                 | \$3,732.5                                   |  |                                  |   | \$3,732.5  |
| EnergyWise  | \$8,645.9                                   |  |                                  |   | \$8,645.9  |
| EnergyWise Multifamily                            | \$1,489.2                                   |  |                                  |   | \$1,489.2  |
| Home Energy Reports                               | \$441.8                                     |  |                                  |   | \$441.8  |
| Residential Pilots                                | \$0.0                                       |  |                                  |   | \$0.0  |
| Residential New Construction                      | \$513.2                                     |  |                                  |   | \$513.2  |
| Comprehensive Marketing - Residential             | \$68.0                                      |  |                                  |   | \$68.0   |
| Community Based Initiatives - Residential         | \$85.0                                      |  |                                  |   | \$85.0   |
| Residential Performance Incentive                 | \$0.0                                       |  | \$0.0                            |   | \$0.0  |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$14,975.5</b>                           | <b>\$0.0</b>   | <b>\$0.0</b>                     | <b>\$14,975.5</b>   | <b>\$14,975.5</b>  |
| <b>Income Eligible Residential</b>                |   |  |                                  |   |  |
| Single Family - Income Eligible Services          | \$6,371.8                                   |  |                                  |   | \$6,371.8  |
| Income Eligible Multifamily                       | \$2,948.9                                   |  |                                  |   | \$2,948.9  |
| Income Eligible Performance Incentive             | \$0.0                                       |  | \$0.0                            |   | \$0.0  |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$9,320.7</b>                            | <b>\$0.0</b>   | <b>\$0.0</b>                     | <b>\$9,320.7</b>  | <b>\$9,320.7</b>   |
| <b>Commercial &amp; Industrial</b>                |   |  |                                  |   |  |
| Large Commercial New Construction                 | \$3,186.6                                   |  |                                  |   | \$3,186.6  |
| Large Commercial Retrofit                         | \$4,696.3                                   |  |                                  |   | \$4,696.3  |
| Small Business Direct Install                     | \$355.9                                     |  |                                  |   | \$355.9  |
| Commercial & Industrial Multifamily               | \$957.3                                     |  |                                  |   | \$957.3  |
| Commercial Pilots                                 | \$215.8                                     |  |                                  |   | \$215.8  |
| Finance Costs                                     | \$0.0                                       | \$0.0  |                                  |   | \$0.0  |
| Community Based Initiatives - C&I                 | \$28.3                                      |  |                                  |   | \$28.3   |
| Commercial Workforce Development                  | \$67.5                                      |  |                                  |   | \$67.5   |
| Commercial & Industrial Performance Incentive     | \$1,700.0                                   |  | \$1,700.0                        |   | \$0.0  |
| <b>Subtotal - Commercial &amp; Industrial</b>     | <b>\$11,207.6</b>                           | <b>\$0.0</b>   | <b>\$1,700.0</b>                 | <b>\$9,260.8</b>  | <b>\$9,507.6</b>   |
| <b>Regulatory</b>                                 |   |  |                                  |   |  |
| EERMC   | \$487.8                                     | \$487.8  |                                  |   | \$487.8  |
| OER   | \$731.7                                     | \$731.7  |                                  |   | \$731.7  |
| <b>Subtotal - Regulatory</b>                      | <b>\$1,219.5</b>                            | <b>\$1,219.5</b>   |                                  |   | <b>\$1,219.5</b>   |
| <b>Grand Total</b>                                | <b>\$36,723.4</b>                           | <b>\$1,219.5</b>   | <b>\$1,700.0</b>                 | <b>\$33,557.0</b>   | <b>\$35,023.4</b>  |

**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 2022 Budget Compared to Approved 2021 Budget (\$000)**

|   | <b>Proposed Budget<br/>2022 from G-2</b> | <b>2021 Approved<br/>Gas Budget</b> | <b>Difference</b> |
|---|--|-------------------------------------|-------------------|
| <b>Non-Income Eligible Residential</b>            |  |                                     |                   |
| ENERGY STAR® HVAC                                 | \$3,732.5                                | \$3,673.0                           | \$59.4            |
| EnergyWise  | \$8,645.9                                | \$8,117.6                           | \$528.3           |
| EnergyWise Multifamily                            | \$1,489.2                                | \$1,491.6                           | -\$2.4            |
| Home Energy Reports                               | \$441.8                                  | \$450.9                             | -\$9.0            |
| Residential Pilots                                | \$0.0                                    | \$0.0                               | \$0.0             |
| Residential New Construction                      | \$513.2                                  | \$674.8                             | -\$161.7          |
| Comprehensive Marketing - Residential             | \$68.0                                   | \$64.8                              | \$3.3             |
| Community Based Initiatives - Residential         | \$85.0                                   | \$75.8                              | \$9.1             |
| Residential Performance Incentive                 | \$0.0                                    | \$595.0                             | -\$595.0          |
| <b>Subtotal - Non-Income Eligible Residential</b> | <b>\$14,975.5</b>                        | <b>\$15,143.5</b>                   | <b>-\$168.0</b>   |
| <b>Income Eligible Residential</b>                |  |                                     |                   |
| Single Family - Income Eligible Services          | \$6,371.8                                | \$5,952.3                           | \$419.4           |
| Income Eligible Multifamily                       | \$2,948.9                                | \$3,009.4                           | -\$60.5           |
| Income Eligible Performance Incentive             | \$0.0                                    | \$425.0                             | -\$425.0          |
| <b>Subtotal - Income Eligible Residential</b>     | <b>\$9,320.7</b>                         | <b>\$9,386.8</b>                    | <b>-\$66.1</b>    |
| <b>Commercial &amp; Industrial</b>                |  |                                     |                   |
| Large Commercial New Construction                 | \$3,186.6                                | \$2,634.2                           | \$552.4           |
| Large Commercial Retrofit                         | \$4,696.3                                | \$5,054.1                           | -\$357.8          |
| Small Business Direct Install                     | \$355.9                                  | \$332.7                             | \$23.2            |
| Commercial & Industrial Multifamily               | \$957.3                                  | \$953.2                             | \$4.0             |
| Commercial Pilots                                 | \$215.8                                  | \$215.8                             | \$0.0             |
| Finance Costs                                     | \$0.0                                    | \$0.0                               | \$0.0             |
| Community Based Initiatives - C&I                 | \$28.3                                   | \$24.8                              | \$3.5             |
| Commercial Workforce Development                  | \$67.5                                   | \$0.0                               | \$67.5            |
| Commercial & Industrial Performance Incentive     | \$1,700.0                                | \$680.0                             | \$1,020.0         |
| <b>Subtotal Commercial &amp; Industrial</b>       | <b>\$11,207.6</b>                        | <b>\$9,894.8</b>                    | <b>\$1,312.9</b>  |
| <b>Regulatory</b>                                 |  |                                     |                   |
| EERMC   | \$487.8                                  | \$275.1                             | \$212.7           |
| OER   | \$731.7                                  | \$275.1                             | \$456.6           |
| <b>Subtotal Regulatory</b>                        | <b>\$1,219.5</b>                         | <b>\$550.1</b>                      | <b>\$669.3</b>    |
| <b>TOTAL BUDGET</b>                               | <b>\$36,723.4</b>                        | <b>\$34,975.2</b>                   | <b>\$1,748.2</b>  |

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) Performance Incentive is allocated to the C&I Sector Consistent with the final PIM approved in Docket 5076.

**Table G-5 - Primary  
National Grid  
Calculation of 2022 Program Year Cost-Effectiveness  
All Dollar Values in (\$000)**

|   | <b>Rhode Island<br/>Benefit/<br/>Cost</b> | <b>Total<br/>Benefit</b> | <b>Program<br/>Implementation<br/>Expenses</b> | <b>Customer<br/>Contribution</b> | <b>Performance<br/>Incentive</b> | <b>\$/Lifetime<br/>MMBtu</b> |
|---|---|--------------------------|--|----------------------------------|----------------------------------|------------------------------|
| <b>Non-Income Eligible Residential</b>          |   |                          |  |                                  |                                  |                              |
| Energy Star® HVAC                               | 1.00                                      | \$7,646.0                | \$3,732.5                                      | \$3,892.9                        |                                  | \$17.34                      |
| EnergyWise                                      | 1.13                                      | \$10,489.0               | \$8,645.9                                      | \$670.2                          |                                  | \$19.47                      |
| EnergyWise MultiFamily                          | 3.45                                      | \$6,317.2                | \$1,489.2                                      | \$344.0                          |                                  | \$12.46                      |
| Home Energy Reports                             | 3.87                                      | \$1,712.1                | \$441.8  | \$0.0                            |                                  | \$4.72                       |
| Residential New Construction                    | 1.62                                      | \$1,550.7                | \$513.2  | \$447.0                          |                                  | \$14.79                      |
| Comprehensive Marketing - Residential           |   |                          | \$68.0   |                                  |                                  |                              |
| Community Based Initiatives - Residential       |   |                          | \$85.0   |                                  |                                  |                              |
| Residential Pilots                              |   |                          | \$0.0  |                                  |                                  |                              |
| <b>Non-Income Eligible Residential Subtotal</b> | <b>1.36</b>                               | <b>\$27,715.0</b>        | <b>\$14,975.5</b>                              | <b>\$5,354.1</b>                 | <b>\$0.0</b>                     | \$16.61                      |
| <b>Income Eligible Residential</b>              |   |                          |  |                                  |                                  |                              |
| Single Family - Income Eligible Services        | 2.04                                      | \$12,986.8               | \$6,371.8                                      | \$0.0                            |                                  | \$29.12                      |
| Income Eligible Multifamily                     | 5.98                                      | \$17,620.5               | \$2,948.9                                      | \$0.0                            |                                  | \$10.80                      |
| <b>Income Eligible Residential Subtotal</b>     | <b>3.28</b>                               | <b>\$30,607.3</b>        | <b>\$9,320.7</b>                               | <b>\$0.0</b>                     | <b>\$0.0</b>                     | \$18.95                      |
| <b>Large Commercial &amp; Industrial</b>        |   |                          |  |                                  |                                  |                              |
| Large Commercial New Construction               | 5.52                                      | \$18,944.5               | \$3,186.6                                      | \$243.0                          |                                  | \$4.35                       |
| Large Commercial Retrofit                       | 5.20                                      | \$38,996.5               | \$4,696.3                                      | \$2,810.2                        |                                  | \$5.63                       |
| Small Business Direct Install                   | 3.95                                      | \$1,686.1                | \$355.9  | \$71.3                           |                                  | \$4.66                       |
| Commercial & Industrial Multifamily             | 5.86                                      | \$6,099.2                | \$957.3  | \$84.0                           |                                  | \$7.94                       |
| Commercial Pilots                               |   |                          | \$215.8  |                                  |                                  |                              |
| Community Based Initiatives - C&I               |   |                          | \$28.3   |                                  |                                  |                              |
| Finance Costs                                   |   |                          | \$0.0  |                                  |                                  |                              |
| Commercial Workforce Development                |   |                          | \$67.5   |                                  |                                  |                              |
| <b>Commercial &amp; Industrial Subtotal</b>     | <b>4.56</b>                               | <b>\$65,726.4</b>        | <b>\$9,507.6</b>                               | <b>\$3,208.6</b>                 | <b>\$1,700.0</b>                 | \$5.42                       |
| <b>Regulatory</b>                               |   |                          |  |                                  |                                  |                              |
| EERMC   |   |                          | \$487.8  |                                  |                                  |                              |
| OER   |   |                          | \$731.7  |                                  |                                  |                              |
| <b>Regulatory Subtotal</b>                      |   |                          | <b>\$1,219.5</b>                               |                                  |                                  |                              |
| <b>Grand Total</b>                              | <b>2.74</b>                               | <b>\$124,048.7</b>       | <b>\$35,023.4</b>                              | <b>\$8,562.7</b>                 | <b>\$1,700.0</b>                 | \$10.74                      |

Notes:

- (1) RI Test B/C Test = Total Benefits from Table G-6 excluding Economic Benefits / Program Implementation Expenses from Table G-3. Also includes effects of free-ridership and spillover.
- (2) For Implementation Expenses derivation, see Table G-3.



**Table G-5 - Secondary  
National Grid  
Calculation of 2022 Program Year Cost-Effectiveness with Economic Benefits Included  
All Dollar Values in (\$000)**

|   | <b>Rhode Island<br/>Benefit/<br/>Cost</b> | <b>Total<br/>Benefit</b> | <b>Program<br/>Implementation<br/>Expenses</b> | <b>Customer<br/>Contribution</b> | <b>Performance<br/>Incentive</b> | <b>\$/Lifetime<br/>MMBtu</b> |
|---|---|--------------------------|--|----------------------------------|----------------------------------|------------------------------|
| <b>Non-Income Eligible Residential</b>          |   |                          |  |                                  |                                  |                              |
| Energy Star® HVAC                               | 1.41                                      | \$10,744.0               | \$3,732.5                                      | \$3,892.9                        |                                  | \$17.34                      |
| EnergyWise                                      | 2.06                                      | \$19,221.4               | \$8,645.9                                      | \$670.2                          |                                  | \$19.47                      |
| EnergyWise MultiFamily                          | 4.77                                      | \$8,744.5                | \$1,489.2                                      | \$344.0                          |                                  | \$12.46                      |
| Home Energy Reports                             | 4.93                                      | \$2,180.4                | \$441.8  | \$0.0                            |                                  | \$4.72                       |
| Residential New Construction                    | 1.73                                      | \$1,663.6                | \$513.2  | \$447.0                          |                                  | \$14.79                      |
| Comprehensive Marketing - Residential           |   |                          | \$68.0   |                                  |                                  |                              |
| Community Based Initiatives - Residential       |   |                          | \$85.0   |                                  |                                  |                              |
| Residential Pilots                              |   |                          | \$0.0  |                                  |                                  |                              |
| <b>Non-Income Eligible Residential Subtotal</b> | <b>2.09</b>                               | <b>\$42,553.9</b>        | <b>\$14,975.5</b>                              | <b>\$5,354.1</b>                 | <b>\$0.0</b>                     | \$16.61                      |
| <b>Income Eligible Residential</b>              |   |                          |  |                                  |                                  |                              |
| Single Family - Income Eligible Services        | 3.03                                      | \$19,294.9               | \$6,371.8                                      | \$0.0                            |                                  | \$29.12                      |
| Income Eligible Multifamily                     | 7.53                                      | \$22,191.3               | \$2,948.9                                      | \$0.0                            |                                  | \$10.80                      |
| <b>Income Eligible Residential Subtotal</b>     | <b>4.45</b>                               | <b>\$41,486.2</b>        | <b>\$9,320.7</b>                               | <b>\$0.0</b>                     | <b>\$0.0</b>                     | \$18.95                      |
| <b>Large Commercial &amp; Industrial</b>        |   |                          |  |                                  |                                  |                              |
| Large Commercial New Construction               | 6.84                                      | \$23,469.5               | \$3,186.6                                      | \$243.0                          |                                  | \$4.35                       |
| Large Commercial Retrofit                       | 6.78                                      | \$50,878.2               | \$4,696.3                                      | \$2,810.2                        |                                  | \$5.63                       |
| Small Business Direct Install                   | 5.40                                      | \$2,308.9                | \$355.9  | \$71.3                           |                                  | \$4.66                       |
| Commercial & Industrial Multifamily             | 7.60                                      | \$7,908.4                | \$957.3  | \$84.0                           |                                  | \$7.94                       |
| Commercial Pilots                               |   |                          | \$215.8  |                                  |                                  |                              |
| Community Based Initiatives - C&I               |   |                          | \$28.3   |                                  |                                  |                              |
| Finance Costs                                   |   |                          | \$0.0  |                                  |                                  |                              |
| Commercial Workforce Development                |   |                          | \$67.5   |                                  |                                  |                              |
| <b>Commercial &amp; Industrial Subtotal</b>     | <b>5.87</b>                               | <b>\$84,565.0</b>        | <b>\$9,507.6</b>                               | <b>\$3,208.6</b>                 | <b>\$1,700.0</b>                 | \$5.42                       |
| <b>Regulatory</b>                               |   |                          |  |                                  |                                  |                              |
| EERMC   |   |                          | \$487.8  |                                  |                                  |                              |
| OER   |   |                          | \$731.7  |                                  |                                  |                              |
| <b>Regulatory Subtotal</b>                      |   |                          | <b>\$1,219.5</b>                               |                                  |                                  |                              |
| <b>Grand Total</b>                              | <b>3.72</b>                               | <b>\$168,605.1</b>       | <b>\$35,023.4</b>                              | <b>\$8,562.7</b>                 | <b>\$1,700.0</b>                 | \$10.74                      |

Notes:

- (1) RI Test B/C Test = Total Benefits from Table G-6 including Economic Benefits / Program Implementation Expenses from Table G-3  
Also includes effects of free-ridership and spillover.
- (2) For Implementation Expenses derivation, see Table G-3.

**Table G-5A**  
**National Grid**  
**Calculation of 2022 Program Year Cost-Effectiveness with TRC Test**  
**All Dollar Values in (\$000)**

|   | <b>TRC<br/>Benefit/<br/>Cost</b> | <b>Total<br/>Benefit</b> | <b>Program<br/>Implementation<br/>Expenses</b> | <b>Customer<br/>Contribution</b> | <b>Performance<br/>Incentive</b> | <b>\$/Lifetime<br/>MMBtu</b> |
|---|----------------------------------|--------------------------|--|----------------------------------|----------------------------------|------------------------------|
| <b>Non-Income Eligible Residential</b>          |                                  |                          |  |                                  |                                  |                              |
| Energy Star® HVAC                               | 0.60                             | \$4,561.9                | \$3,732.5                                      | \$3,892.9                        |                                  | \$17.3                       |
| EnergyWise                                      | 0.82                             | \$7,623.0                | \$8,645.9                                      | \$670.2                          |                                  | \$19.5                       |
| EnergyWise MultiFamily                          | 2.91                             | \$5,329.4                | \$1,489.2                                      | \$344.0                          |                                  | \$12.5                       |
| Home Energy Reports                             | 1.70                             | \$749.9                  | \$441.8  | \$0.0                            |                                  | \$4.7                        |
| Residential New Construction                    | 1.18                             | \$1,133.3                | \$513.2  | \$447.0                          |                                  | \$14.8                       |
| Comprehensive Marketing - Residential           |                                  |                          | \$68.0   |                                  |                                  |                              |
| Community Based Initiatives - Residential       |                                  |                          | \$85.0   |                                  |                                  |                              |
| Residential Pilots                              |                                  |                          | \$0.0  |                                  |                                  |                              |
| Residential Workforce Development               |                                  |                          | \$0.0  |                                  |                                  |                              |
| <b>Non-Income Eligible Residential Subtotal</b> | <b>0.95</b>                      | <b>\$19,397.5</b>        | <b>\$14,975.5</b>                              | <b>\$5,354.1</b>                 | <b>\$0.0</b>                     | <b>\$16.6</b>                |
| <b>Income Eligible Residential</b>              |                                  |                          |  |                                  |                                  |                              |
| Single Family - Income Eligible Services        | 1.81                             | \$11,530.4               | \$6,371.8                                      | \$0.0                            |                                  | \$29.1                       |
| Income Eligible Multifamily                     | 5.37                             | \$15,840.6               | \$2,948.9                                      | \$0.0                            |                                  | \$10.8                       |
| Income Eligible Workforce Development           |                                  |                          | \$0.0  |                                  |                                  | \$0.0                        |
| <b>Income Eligible Residential Subtotal</b>     | <b>2.94</b>                      | <b>\$27,371.0</b>        | <b>\$9,320.7</b>                               | <b>\$0.0</b>                     | <b>\$0.0</b>                     | <b>\$18.9</b>                |
| <b>Large Commercial &amp; Industrial</b>        |                                  |                          |  |                                  |                                  |                              |
| Large Commercial New Construction               | 3.84                             | \$13,162.1               | \$3,186.6                                      | \$243.0                          |                                  | \$4.3                        |
| Large Commercial Retrofit                       | 3.73                             | \$27,966.9               | \$4,696.3                                      | \$2,810.2                        |                                  | \$5.6                        |
| Small Business Direct Install                   | 2.36                             | \$1,009.5                | \$355.9  | \$71.3                           |                                  | \$4.7                        |
| Commercial & Industrial Multifamily             | 4.92                             | \$5,125.3                | \$957.3  | \$84.0                           |                                  | \$7.9                        |
| Commercial Pilots                               |                                  |                          | \$215.8  | \$0.0                            |                                  |                              |
| Community Based Initiatives - C&I               |                                  |                          | \$28.3   | \$0.0                            |                                  |                              |
| Finance Costs                                   |                                  |                          | \$0.0  | \$0.0                            |                                  |                              |
| Commercial Workforce Development                |                                  |                          | \$67.5   | \$0.0                            |                                  |                              |
| <b>Commercial &amp; Industrial Subtotal</b>     | <b>3.28</b>                      | <b>\$47,263.8</b>        | <b>\$9,507.6</b>                               | <b>\$3,208.6</b>                 | <b>\$1,700.0</b>                 | <b>\$5.4</b>                 |
| <b>Regulatory</b>                               |                                  |                          |  |                                  |                                  |                              |
| EERMC   |                                  |                          | \$487.8  |                                  |                                  |                              |
| OER   |                                  |                          | \$731.7  |                                  |                                  |                              |
| <b>Regulatory Subtotal</b>                      |                                  |                          | <b>\$1,219.5</b>                               |                                  |                                  |                              |
| <b>Grand Total</b>                              | <b>2.08</b>                      | <b>\$94,032.3</b>        | <b>\$35,023.4</b>                              | <b>\$8,562.7</b>                 | <b>\$1,700.0</b>                 | <b>\$10.7</b>                |

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.

Table G-6  
National Grid  
Summary of 2022 Benefits by Program

|   | Total            | Benefits (\$000)          |                   |                   |                |                   |              |                   |             |                 |             |                 |                       |             |                |                          |                 |                 |                |                 |         |       |
|---|------------------|---------------------------|-------------------|-------------------|----------------|-------------------|--------------|-------------------|-------------|-----------------|-------------|-----------------|-----------------------|-------------|----------------|--------------------------|-----------------|-----------------|----------------|-----------------|---------|-------|
|   |                  | Total (Economic Excluded) |                   | Natural Gas       |                | Natural Gas DRPPE |              | Electric Capacity |             |                 |             | Electric Energy |                       |             |                | Non-Electric and Non-Gas |                 |                 |                | Societal        |         |       |
|   |                  | Natural Gas               | Natural Gas DRPPE | Summer Generation | Capacity DRPPE | Trans             | Dist         | Reliability       | Winter Peak | Winter Off Peak | Summer Peak | Summer Off Peak | Electric Energy DRPPE | Oil         | Other Resource | Non Resource             | Carbon          | NOx             | Economic       |                 |         |       |
| <b>Non-Income Eligible Residential</b>          |                  |                           |                   |                   |                |                   |              |                   |             |                 |             |                 |                       |             |                |                          |                 |                 |                |                 |         |       |
| Energy Wise                                     | \$19,221         | \$10,489                  | \$4,123           | \$33              | \$58           | \$101             | \$75         | \$74              | \$5         | \$5             | \$47        | \$53            | \$48                  | \$41        | \$35           | \$81                     | \$2,878         | \$2,554         | \$312          | \$8,732         |         |       |
| Energy Star® HVAC                               | \$10,744         | \$7,646                   | \$3,725           | \$42              | \$7            | \$20              | \$10         | \$10              | \$1         | \$1             | -\$7        | -\$7            | \$4                   | \$4         | -\$2           | \$0                      | \$190           | \$563           | \$2,792        | \$2,921         | \$3,098 |       |
| EnergyWise Multifamily                          | \$8,745          | \$6,317                   | \$1,265           | \$13              | \$7            | \$17              | \$10         | \$10              | \$1         | \$1             | \$1         | \$1             | \$6                   | \$5         | \$3            | \$43                     | \$3,948         | \$891           | \$971          | \$971           | \$2,427 |       |
| Home Energy Reports                             | \$2,180          | \$1,712                   | \$725             | \$0               | \$0            | \$0               | \$0          | \$0               | \$0         | \$0             | \$0         | \$0             | \$0                   | \$0         | \$0            | \$0                      | \$0             | \$0             | \$0            | \$0             | \$0     | \$468 |
| Residential New Construction                    | \$1,664          | \$1,551                   | \$564             | \$6               | \$0            | \$0               | \$0          | \$0               | \$0         | \$0             | \$0         | \$0             | \$0                   | \$0         | \$0            | \$7                      | \$557           | \$374           | \$43           | \$43            | \$13    |       |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>\$42,554</b>  | <b>\$27,715</b>           | <b>\$10,402</b>   | <b>\$120</b>      | <b>\$73</b>    | <b>\$138</b>      | <b>\$95</b>  | <b>\$94</b>       | <b>\$7</b>  | <b>\$7</b>      | <b>\$41</b> | <b>\$47</b>     | <b>\$57</b>           | <b>\$50</b> | <b>\$36</b>    | <b>\$291</b>             | <b>\$7,946</b>  | <b>\$7,510</b>  | <b>\$807</b>   | <b>\$14,839</b> |         |       |
| <b>Income Eligible Residential</b>              |                  |                           |                   |                   |                |                   |              |                   |             |                 |             |                 |                       |             |                |                          |                 |                 |                |                 |         |       |
| Single Family - Income Eligible Services        | \$19,295         | \$12,987                  | \$1,923           | \$18              | \$25           | \$49              | \$33         | \$32              | \$2         | \$2             | \$29        | \$34            | \$19                  | \$17        | \$24           | \$0                      | \$9,323         | \$1,311         | \$146          | \$6,308         |         |       |
| Income Eligible Multifamily                     | \$22,191         | \$17,620                  | \$2,374           | \$24              | \$4            | \$13              | \$6          | \$6               | \$1         | \$1             | \$1         | \$1             | \$3                   | \$3         | \$2            | \$2                      | \$13,352        | \$1,600         | \$180          | \$4,571         |         |       |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>\$41,486</b>  | <b>\$30,607</b>           | <b>\$4,298</b>    | <b>\$42</b>       | <b>\$29</b>    | <b>\$63</b>       | <b>\$38</b>  | <b>\$38</b>       | <b>\$3</b>  | <b>\$3</b>      | <b>\$30</b> | <b>\$35</b>     | <b>\$22</b>           | <b>\$20</b> | <b>\$26</b>    | <b>\$2</b>               | <b>\$22,675</b> | <b>\$2,911</b>  | <b>\$336</b>   | <b>\$10,879</b> |         |       |
| <b>Commercial &amp; Industrial</b>              |                  |                           |                   |                   |                |                   |              |                   |             |                 |             |                 |                       |             |                |                          |                 |                 |                |                 |         |       |
| Large Commercial New Construction               | \$23,469         | \$18,945                  | \$5,733           | \$67              | \$0            | \$0               | \$0          | \$0               | \$0         | \$0             | \$0         | \$0             | \$0                   | \$0         | \$0            | \$47                     | \$7,314         | \$5,221         | \$561          | \$4,525         |         |       |
| Large Commercial Retrofit                       | \$50,878         | \$38,997                  | \$10,462          | \$210             | \$0            | \$0               | \$0          | \$0               | \$0         | \$0             | \$0         | \$0             | \$0                   | \$0         | \$0            | \$39                     | \$17,266        | \$10,071        | \$958          | \$11,882        |         |       |
| Small Business Direct Install                   | \$2,309          | \$1,686                   | \$709             | \$9               | \$0            | \$0               | \$0          | \$0               | \$0         | \$0             | \$0         | \$0             | \$0                   | \$0         | \$0            | \$291                    | \$0             | \$611           | \$65           | \$623           |         |       |
| Commercial & Industrial Multifamily             | \$7,908          | \$6,099                   | \$1,069           | \$14              | \$4            | \$13              | \$6          | \$6               | \$1         | \$1             | \$1         | \$1             | \$3                   | \$2         | \$2            | \$26                     | \$3,979         | \$881           | \$93           | \$1,809         |         |       |
| <b>Commercial &amp; Industrial SUBTOTAL</b>     | <b>\$84,565</b>  | <b>\$65,726</b>           | <b>\$17,974</b>   | <b>\$300</b>      | <b>\$4</b>     | <b>\$13</b>       | <b>\$6</b>   | <b>\$6</b>        | <b>\$1</b>  | <b>\$1</b>      | <b>\$1</b>  | <b>\$1</b>      | <b>\$3</b>            | <b>\$2</b>  | <b>\$2</b>     | <b>\$404</b>             | <b>\$28,549</b> | <b>\$16,785</b> | <b>\$1,678</b> | <b>\$18,839</b> |         |       |
| <b>Grand Total</b>                              | <b>\$168,605</b> | <b>\$124,049</b>          | <b>\$32,674</b>   | <b>\$462</b>      | <b>\$106</b>   | <b>\$214</b>      | <b>\$139</b> | <b>\$138</b>      | <b>\$11</b> | <b>\$82</b>     | <b>\$71</b> | <b>\$82</b>     | <b>\$83</b>           | <b>\$72</b> | <b>\$64</b>    | <b>\$0</b>               | <b>\$59,170</b> | <b>\$27,205</b> | <b>\$2,811</b> | <b>\$44,556</b> |         |       |

**Table G-6A  
National Grid  
Summary of 2022 Impacts by Program**

|   | <b>Gas Saved (MMBtu)</b> |                  |
|---|--------------------------|------------------|
|   | <b>Annual</b>            | <b>Lifetime</b>  |
| <b>Non-Income Eligible Residential</b>          |                          |                  |
| EnergyWise                                      | 20,850                   | 478,550          |
| Energy Star® HVAC                               | 26,740                   | 439,717          |
| EnergyWise Multifamily                          | 8,279                    | 147,064          |
| Home Energy Reports                             | 93,548                   | 93,548           |
| Residential New Construction                    | 3,610                    | 64,899           |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>153,027</b>           | <b>1,223,778</b> |
|   |                          |                  |
| <b>Income Eligible Residential</b>              |                          |                  |
| Single Family - Income Eligible Services        | 10,942                   | 218,847          |
| Income Eligible Multifamily                     | 14,700                   | 273,085          |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>25,642</b>            | <b>491,932</b>   |
|   |                          |                  |
| <b>Commercial &amp; Industrial</b>              |                          |                  |
| Large Commercial New Construction               | 52,956                   | 788,763          |
| Large Commercial Retrofit                       | 142,888                  | 1,332,508        |
| Small Business Direct Install                   | 6,113                    | 91,700           |
| Commercial & Industrial Multifamily             | 8,803                    | 131,220          |
| <b>Commercial &amp; Industrial SUBTOTAL</b>     | <b>210,760</b>           | <b>2,344,192</b> |
|   |                          |                  |
| <b>Grand Total</b>                              | <b>389,430</b>           | <b>4,059,902</b> |

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 2022 and 2021 Goals**

|   | Proposed 2022 Goal                          |   | Proposed 2022 Tracking      |   | Approved 2021                             |   | Difference                                |  |
|---|---|---|-----------------------------|---|---|---|---|--|
|   | Lifetime Energy Savings (MMBtu Natural Gas) | Annual Energy Savings (MMBtu Natural Gas) | Planned Unique Participants | Lifetime Energy Savings (MMBtu Natural Gas) | Annual Energy Savings (MMBtu Natural Gas) | Lifetime Energy Savings (MMBtu Natural Gas) | Annual Energy Savings (MMBtu Natural Gas) |  |
| <b>Non-Income Eligible Residential</b>          |   |   |                             |   |   |   |   |  |
| Energy Wise                                     | 478,550                                     | 20,850                                    | 1,761                       | 476,550                                     | 20,869                                    | 2,001                                       | -20                                       |  |
| Energy Star® HVAC                               | 439,717                                     | 26,740                                    | 3,062                       | 667,485                                     | 38,345                                    | -227,768                                    | -11,604                                   |  |
| EnergyWise Multifamily                          | 147,064                                     | 8,279                                     | 4,000                       | 148,675                                     | 8,633                                     | -1,611                                      | -354                                      |  |
| Home Energy Reports                             | 93,548                                      | 93,548                                    | 152,324                     | 93,548                                      | 93,548                                    | 0   | 0   |  |
| Residential New Construction                    | 64,899                                      | 3,610                                     | 289                         | 85,272                                      | 4,445                                     | -20,372                                     | -835                                      |  |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>1,223,778</b>                            | <b>153,027</b>                            | <b>161,436</b>              | <b>1,471,530</b>                            | <b>165,840</b>                            | <b>-247,751</b>                             | <b>-12,813</b>                            |  |
| <b>Income Eligible Residential</b>              |   |   |                             |   |   |   |   |  |
| Single Family - Income Eligible Services        | 218,847                                     | 10,942                                    | 1,098                       | 201,104                                     | 10,055                                    | 17,743                                      | 887                                       |  |
| Income Eligible Multifamily                     | 273,085                                     | 14,700                                    | 3,150                       | 315,545                                     | 14,399                                    | -42,460                                     | 301                                       |  |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>491,932</b>                              | <b>25,642</b>                             | <b>4,248</b>                | <b>516,649</b>                              | <b>24,454</b>                             | <b>-24,717</b>                              | <b>1,188</b>                              |  |
| <b>Commercial &amp; Industrial</b>              |   |   |                             |   |   |   |   |  |
| Large Commercial New Construction               | 788,763                                     | 52,956                                    | 94                          | 437,398                                     | 27,631                                    | 351,365                                     | 25,325                                    |  |
| Large Commercial Retrofit                       | 1,332,508                                   | 142,888                                   | 62                          | 1,455,776                                   | 187,283                                   | -123,268                                    | -44,395                                   |  |
| Small Business Direct Install                   | 91,700                                      | 6,113                                     | 170                         | 48,861                                      | 4,886                                     | 42,838                                      | 1,227                                     |  |
| Commercial & Industrial Multifamily             | 131,220                                     | 8,803                                     | 729                         | 141,869                                     | 9,444                                     | -10,649                                     | -641                                      |  |
| <b>Commercial &amp; Industrial SUBTOTAL</b>     | <b>2,344,192</b>                            | <b>210,760</b>                            | <b>1,056</b>                | <b>2,083,905</b>                            | <b>229,243</b>                            | <b>260,286</b>                              | <b>-18,483</b>                            |  |
| <b>TOTAL</b>                                    | <b>4,059,902</b>                            | <b>389,430</b>                            | <b>166,740</b>              | <b>4,072,084</b>                            | <b>419,537</b>                            | <b>-12,182</b>                              | <b>-30,108</b>                            |  |

**Notes:**

- (1) Participants can participate in more than one program, for example Home Energy Reports and EnergyWise.
- (2) Planned 2022 participation takes into account net-to-gross and estimates unique participation by taking into account 2021 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-8A  
National Grid  
2022 Gas PIM Benefits, Allocations, and Categorization (\$000)

| (1)   | (2) Natural Gas Benefits    |                             | (3) Utility NEIs            | (4) Capacity      |                   | (5) Electric Capacity |                   | (7) Dist          | (8) Reliability   | (9) Winter        |                   | (10) Winter Off Peak |                   | (11) Electric Energy |                   | (12) Summer Off Peak | (13) Electric Energy DRIPe | (14) Non-Electric and Non-Gas |                | (16) Non Resource | (17) Carbon | (18) NOx | (19) Economic |
|---|-----------------------------|-----------------------------|-----------------------------|-------------------|-------------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|----------------------------|-------------------------------|----------------|-------------------|-------------|----------|---------------|
|   | Natural Gas DRIPe           | Natural Gas                 |                             | Summer Generation | Capacity DRIPe    | Trans                 | Trans             |                   |                   | Winter Peak       | Winter Off Peak   | Summer Peak          | Summer Off Peak   | Oil                  | Other Resource    |                      |                            |                               |                |                   |             |          |               |
| <b>Non-Income Eligible Residential</b>          |                             |                             |                             |                   |                   |                       |                   |                   |                   |                   |                   |                      |                   |                      |                   |                      |                            |                               |                |                   |             |          |               |
| EnergyWise                                      | \$4,123                     | \$33                        | \$0                         | \$58              | \$101             | \$75                  | \$74              | \$5               | \$5               | \$47              | \$53              | \$48                 | \$41              | \$35                 | \$0               | \$51                 | \$2,878                    | \$2,554                       | \$312          | \$8,732           |             |          |               |
| Energy Star@HVAC                                | \$3,725                     | \$42                        | \$0                         | \$7               | \$20              | \$10                  | \$10              | \$1               | \$1               | \$7               | \$7               | \$4                  | \$4               | \$2                  | \$0               | \$190                | \$563                      | \$2,792                       | \$292          | \$3,098           |             |          |               |
| EnergyWise Multifamily                          | \$1,265                     | \$13                        | \$0                         | \$7               | \$17              | \$10                  | \$10              | \$1               | \$1               | \$1               | \$1               | \$6                  | \$5               | \$3                  | \$0               | \$43                 | \$3,948                    | \$891                         | \$971          | \$2,427           |             |          |               |
| Home Energy Reports                             | \$725                       | \$25                        | \$0                         | \$0               | \$0               | \$0                   | \$0               | \$0               | \$0               | \$0               | \$0               | \$0                  | \$0               | \$0                  | \$0               | \$0                  | \$0                        | \$0                           | \$0            | \$64              | \$468       |          |               |
| Residential New Construction                    | \$564                       | \$6                         | \$0                         | \$0               | \$0               | \$0                   | \$0               | \$0               | \$0               | \$0               | \$0               | \$0                  | \$0               | \$0                  | \$0               | \$7                  | \$557                      | \$374                         | \$43           | \$113             |             |          |               |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | <b>\$10,402</b>             | <b>\$120</b>                | <b>\$0</b>                  | <b>\$73</b>       | <b>\$138</b>      | <b>\$95</b>           | <b>\$94</b>       | <b>\$7</b>        | <b>\$7</b>        | <b>\$41</b>       | <b>\$47</b>       | <b>\$57</b>          | <b>\$50</b>       | <b>\$36</b>          | <b>\$0</b>        | <b>\$291</b>         | <b>\$7,946</b>             | <b>\$7,510</b>                | <b>\$807</b>   | <b>\$14,839</b>   |             |          |               |
| <b>Income Eligible Residential</b>              |                             |                             |                             |                   |                   |                       |                   |                   |                   |                   |                   |                      |                   |                      |                   |                      |                            |                               |                |                   |             |          |               |
| Single Family - Income Eligible Services        | \$1,923                     | \$18                        | \$109                       | \$25              | \$49              | \$33                  | \$32              | \$2               | \$2               | \$29              | \$34              | \$19                 | \$17              | \$24                 | \$0               | \$0                  | \$9,214                    | \$1,311                       | \$146          | \$6,308           |             |          |               |
| Income Eligible Multifamily                     | \$2,374                     | \$24                        | \$87                        | \$4               | \$13              | \$6                   | \$6               | \$1               | \$1               | \$1               | \$0               | \$3                  | \$3               | \$2                  | \$0               | \$52                 | \$13,265                   | \$1,600                       | \$180          | \$4,571           |             |          |               |
| <b>Income Eligible Residential SUBTOTAL</b>     | <b>\$4,298</b>              | <b>\$42</b>                 | <b>\$196</b>                | <b>\$29</b>       | <b>\$63</b>       | <b>\$38</b>           | <b>\$38</b>       | <b>\$3</b>        | <b>\$3</b>        | <b>\$30</b>       | <b>\$35</b>       | <b>\$22</b>          | <b>\$20</b>       | <b>\$26</b>          | <b>\$0</b>        | <b>\$52</b>          | <b>\$22,479</b>            | <b>\$2,911</b>                | <b>\$326</b>   | <b>\$10,879</b>   |             |          |               |
| <b>Commercial &amp; Industrial</b>              |                             |                             |                             |                   |                   |                       |                   |                   |                   |                   |                   |                      |                   |                      |                   |                      |                            |                               |                |                   |             |          |               |
| Large Commercial New Construction               | \$5,733                     | \$67                        | \$0                         | \$0               | \$0               | \$0                   | \$0               | \$0               | \$0               | \$0               | \$0               | \$0                  | \$0               | \$0                  | \$0               | \$47                 | \$7,314                    | \$5,221                       | \$561          | \$4,525           |             |          |               |
| Large Commercial Retrofit                       | \$10,462                    | \$210                       | \$0                         | \$0               | \$0               | \$0                   | \$0               | \$0               | \$0               | \$0               | \$0               | \$0                  | \$0               | \$0                  | \$0               | \$39                 | \$17,256                   | \$10,071                      | \$958          | \$11,882          |             |          |               |
| Small Business Direct Install                   | \$709                       | \$9                         | \$0                         | \$0               | \$0               | \$0                   | \$0               | \$0               | \$0               | \$0               | \$0               | \$0                  | \$0               | \$0                  | \$0               | \$291                | \$0                        | \$611                         | \$65           | \$623             |             |          |               |
| Commercial & Industrial Multifamily             | \$1,069                     | \$14                        | \$0                         | \$4               | \$13              | \$6                   | \$6               | \$1               | \$1               | \$1               | \$0               | \$3                  | \$2               | \$2                  | \$0               | \$26                 | \$3,979                    | \$881                         | \$93           | \$1,809           |             |          |               |
| <b>Commercial &amp; Industrial SUBTOTAL</b>     | <b>\$17,974</b>             | <b>\$300</b>                | <b>\$0</b>                  | <b>\$4</b>        | <b>\$13</b>       | <b>\$6</b>            | <b>\$6</b>        | <b>\$1</b>        | <b>\$1</b>        | <b>\$1</b>        | <b>\$0</b>        | <b>\$3</b>           | <b>\$2</b>        | <b>\$2</b>           | <b>\$0</b>        | <b>\$404</b>         | <b>\$28,549</b>            | <b>\$16,785</b>               | <b>\$1,678</b> | <b>\$18,839</b>   |             |          |               |
| <b>Grand Total</b>                              | <b>\$32,674</b>             | <b>\$462</b>                | <b>\$196</b>                | <b>\$106</b>      | <b>\$214</b>      | <b>\$139</b>          | <b>\$138</b>      | <b>\$11</b>       | <b>\$11</b>       | <b>\$71</b>       | <b>\$82</b>       | <b>\$83</b>          | <b>\$72</b>       | <b>\$64</b>          | <b>\$0</b>        | <b>\$747</b>         | <b>\$58,975</b>            | <b>\$27,205</b>               | <b>\$2,811</b> | <b>\$44,556</b>   |             |          |               |
| Included in PIMP (Y/N)                          | Y                           | Y                           | Y                           | Y                 | Y                 | Y                     | Y                 | Y                 | Y                 | Y                 | Y                 | Y                    | Y                 | Y                    | Y                 | Y                    | N                          | N                             | N              | N                 |             |          |               |
| Percent Application in PIM                      | 100%                        | 100%                        | 100%                        | 50%               | 50%               | 50%                   | 50%               | 50%               | 50%               | 50%               | 50%               | 50%                  | 50%               | 50%                  | 50%               | 50%                  | 0%                         | 0%                            | 0%             | 0%                |             |          |               |
| Category  | Gas Utility System Benefits | Gas Utility System Benefits | Gas Utility System Benefits | Resource Benefits | Resource Benefits | Resource Benefits     | Resource Benefits | Resource Benefits | Resource Benefits | Resource Benefits | Resource Benefits | Resource Benefits    | Resource Benefits | Resource Benefits    | Resource Benefits | Resource Benefits    | NA                         | NA                            | NA             | NA                |             |          |               |

Notes  
From 2022 Benefit-Cost Model, reflects benefits in Table G-6

**Table G-8B**  
**National Grid**  
**2022 Gas PIM Costs**

|   | (1)                                     | (2)              | (3)                              |
|---|---|------------------|----------------------------------|
|   | Costs (\$)                              |                  |                                  |
|   | Eligible Spending Budget from Table G-3 | Regulatory Costs | Total Costs for PIM Calculations |
| <b>Non-Income Eligible Residential SUBTOTAL</b> | \$14,975,536                            | \$406,493        | \$15,382,029                     |
| <b>Income Eligible Residential SUBTOTAL</b>     | \$9,320,710                             | \$406,493        | \$9,727,203                      |
| <b>Commercial &amp; Industrial SUBTOTAL</b>     | \$9,260,804                             | \$406,493        | \$9,667,297                      |
| Included in PIM? (Y/N)                          | Y                                       | Y                | Y                                |

**Notes**

Source is Table G-2 and G-3. Regulatory costs allocated equally to each sector.

Table G-8C  
 National Grid  
 2022 Gas PIM and SOA

| Sector                          | Planned Eligible Benefits |                                  | Planned Eligible Costs                      | Planned Eligible Net Benefits (d) | Design Performance Achievement                          | Design Performance Payout | Design Payout Rate | Design Payout Rate Thresholds   | Payout Rate Adjustments   | Payout Cap  | Service Quality Metric        |
|---------------------------------|---------------------------|----------------------------------|---|-----------------------------------|---|---------------------------|--------------------|---|---|-------------|-------------------------------|
|                                 | (a)                       | (b)                              |   |                                   |   |                           |                    |   |   |             |                               |
|                                 |                           | 100% Gas Utility System Benefits | Eligible Spending Budget + Regulatory Costs | $=(a)-(b)-(c)$                    | Net benefits at which design incentive pool is achieved | Set by PUC                | $=f/(g)$           | Achievement levels at which the Payout Rate Adjustments in (i) will be applied—Set by PUC   | Factor to adjust Design Payout Rate for if final program achievement fall within the ranges in (b)—Set by PUC | $=1.25*(f)$ | Yes if (d) ≤ 0; No if (d) > 0 |
| Non-income Eligible Residential | \$10,522,162              | \$464,590                        | \$15,382,029                                | -\$4,395,277                      | \$2,000,000   | \$500,000                 | 25%                | a. Achievement < 25%<br>b. 25% ≤ Achievement < 50%<br>c. 50% ≤ Achievement < 75%<br>d. 75% ≤ Achievement<br>* Spending > Planned Eligible Costs | a. 0<br>b. Achievement/100 + 0.1<br>c. Achievement/100 + 0.25<br>d. 0<br>* See Boundary Rules                 | \$625,000   | Yes                           |
| Income Eligible Residential     | \$4,535,473               | \$178,040                        | \$9,727,203                                 | -\$5,013,690                      | \$2,000,000   | \$500,000                 | 25%                |   |   | \$625,000   | Yes                           |
| Commercial & Industrial         | \$18,273,327              | \$220,617                        | \$9,667,297                                 | -\$8,226,647                      | -\$8,226,647  | \$1,700,000               | 19%                |   |   | \$2,125,000 | No                            |

Sector PI = min( Payout Cap(i), Actual Net Benefits\* Design Payout Rate(g) + Payout Rate Adjustment(i) )

Sector SOA = Maximum Service Adjustment(e) + Service Achievement Scaling Factor(g)

| Sector                          | Planned Eligible Benefits |                                  | Planned Eligible Costs                      | Design Service Achievement | Maximum Service Adjustment                      | Service Adjustment Thresholds  | Service Achievement Scaling Factors                                    | Achievement Cost Adjustment   |
|---------------------------------|---------------------------|----------------------------------|---|----------------------------|---|--|--|---|
|                                 | (a)                       | (b)                              |   |                            |   |  |  |   |
|                                 |                           | 100% Gas Utility System Benefits | Eligible Spending Budget + Regulatory Costs | $=(a)-(b)$                 | Maximum downward adjustment to earned incentive | Adjusted Achievement levels at which the Service Adjustments in (e) will be applied; adjustment is calculated in (h) | Factor to scale program achievement that fall within the ranges in (f) | Actual-cost-based adjustment factor applied to achievement. Result is if the difference between achievement and cost variances are greater than 15% the Actual Achievement will be adjusted for use in  |
| Non-income Eligible Residential | \$10,522,162              | \$464,590                        | \$15,382,029                                | \$10,986,752               | \$386,750                                       | a. Adjusted Achievement < 65%<br>b. 65% ≤ Adjusted Achievement < 95%<br>c. 95% ≤ Adjusted Achievement                | a. 0<br>b. 0.95-Adjusted Achievement/30<br>c. 0                        | Performance Variance = "Actual Benefits" / "Design Achievement" - "Spending" / "Planned Eligible Cost"<br>If the absolute value (Performance Variance) ≤ 0.05, then Adjusted Achievement = Actual Achievement<br>Else Adjusted Achievement = Actual Achievement * (1+ Performance Variance) |
| Income Eligible Residential     | \$4,535,473               | \$178,040                        | \$9,727,203                                 | -\$4,713,513               | \$276,290                                       |  |  |   |
| Commercial & Industrial         | \$18,273,327              | \$220,617                        | \$9,667,297                                 | N/A                        | N/A   |  |  |   |



**Table G-9  
National Grid  
Revolving Loan Fund Projections**

**Large C&I Revolving Loan Fund**

|      |  |                     |
|------|--|---------------------|
| (1)  | <b>Total Loan Fund Deposits Through 2021</b>     | <b>\$ 3,590,440</b> |
| (2)  | Current Loan Fund Balance                        | \$ 2,398,955        |
| (3)  | Projected Loans by Year End 2021                 | \$ 587,000          |
| (4)  | Projected Repayments by Year End 2021            | \$ 213,986          |
| (5)  | <b>Projected Year End Loan Fund Balance 2021</b> | <b>\$ 2,025,941</b> |
| (6)  | 2022 Fund Injection                              | \$ -                |
| (7)  | <b>Projected Loan Fund Balance, January 2022</b> | <b>\$ 2,025,941</b> |
| (8)  | Projected Repayments throughout 2022             | \$ 402,925          |
| (9)  | Estimated Loans in 2022                          | \$ 1,200,000        |
| (10) | <b>Projected Year End Loan Fund Balance 2022</b> | <b>\$ 1,228,866</b> |

Notes

- 1 Funding injections since loan funds began. Net of any adjustments.
- 2 Current Loan Fund Balance is through July 2021
- 3 Projected Loans by Year End 2021 is estimated based on current commitments  
Projected Repayments by Year End 2021 is estimated based on projected loans
- 4 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 2007 - 2022**  
**\$(000)**

| Gas  | 2007 <sup>(4)</sup> | 2008      | 2009      | 2010      | 2011 <sup>(5)</sup> | 2012      | 2013 <sup>(6)</sup> | 2014        | 2015        | 2016        | 2017        | 2018        | 2019        | 2020 <sup>(7)</sup> | 2021 <sup>(8)</sup> | 2022 <sup>(9)</sup> |
|--|---------------------|-----------|-----------|-----------|---------------------|-----------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------|---------------------|---------------------|
| Energy Efficiency Budget (\$Million) <sup>(1)</sup>                          | -                   | \$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              | \$35.0              | \$36.7              |
| Spending Budget (\$Million) <sup>(2)</sup>                                   | -                   | \$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              | \$32.4              | \$33.6              |
| Actual Expenditures (\$Million) <sup>(3)</sup>                               | -                   | \$7.4     | \$6.3     | \$5.5     | \$4.9               | \$13.3    | \$19.6              | \$21.5      | \$21.5      | \$24.6      | \$29.1      | \$28.8      | \$29.5      | \$24.6              |                     |                     |
| Incentive Percentage <sup>(2)</sup>  | -                   | 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                  | 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         | \$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 | \$347,732           |                     |                     |
| Annual MMBtu Energy Savings Goal Achieved (%)                                |                     | 109%      | 139%      | 127%      | 117%                | 99%       | 109%                | 124%        | 111%        | 106%        | 113%        | 120%        | 104%        | 71%                 |                     |                     |
| System Benefits Charge (\$/therm) <sup>(11)</sup> - all non-exempt customers | \$0.0071            | \$0.0107  | \$0.0150  | \$0.0150  | \$0.0411            | \$0.0384  | \$0.0417            | -           | \$0.0600    | \$0.0781    | \$0.0748    | \$0.0888    | \$0.0869    | \$0.1011            | \$0.0871            | \$0.1221            |
| Residential System Benefits Charge (\$/therm)                                | -                   | -         | -         | -         | -                   | -         | -                   | \$0.0492    | \$0.0637    | \$0.0487    | \$0.0726    | \$0.0671    | \$0.0420    | \$0.0704            | \$0.0596            | \$0.0836            |
| C&I System Benefits Charge (\$/therm)  | \$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             | \$73.69             | \$103.30            |
| Annual Cost to 846 Therm/year Residential Customer w/o tax <sup>(6)</sup>    | \$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             | \$75.97             | \$106.49            |

**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 Connected Solutions 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 \$0.41 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 \$0.041 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) 2021 values are planned.
- (8) 2022 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 2022 due to new performance incentive mechanism developed for the 2022 Annual Plan. See Section 11 of the Main Text of the 2022 Annual Plan for additional details.



## 2022 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 2022 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 and gas bill impact analysis, rate changes are modeled by mapping energy efficiency (EE) programs to groupings of customers approximating 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 both models, other effects of energy efficiency beyond direct energy savings such as price suppression (both) and avoided infrastructure investments (electric) are also included.

The gas bill and rate impact analysis use a model that was developed by Synapse Energy Economics (Synapse), first used for the 2021 EE Plan, which 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 gas 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 this 2022 analysis, National Grid used the same methods as those employed in 2021 for the natural gas analysis. On the other hand, the electric analysis methodology was adjusted which resulted in notable differences in findings – especially in participant bill savings. The key takeaways of the bill impact analyses are:

- Most customers are participating in an EE program, this is partially attributable to the wide reach of the residential home energy reports program that reaches nearly all gas and electric residential customers.
- In the electric portfolio, high participation means that over the lifetimes of the programs proposed for 2022, the average Rhode Island customer's (participants and non-participants combined) bill will be less than or equal to a scenario with 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 0.33% and 0.77% depending on sector due to the 2022 annual plan. Participants in all programs and customer segment groupings see reductions in their long-term bills due to their 2022 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 presented in Rates proceedings before the PUC. The models analyze two cases: the fulfillment of the 2022 Plan and the absence of an efficiency plan in 2022. This comparison isolates the effects of the proposed 2022 EE program charge and Fully Reconciling Funding Mechanism. It assumes energy efficiency plans have been implemented before 2022 but will not be offered starting in 2022. The analysis also incorporates how system-wide reduction in energy consumption affects the different elements of rates such as transmission, distribution, and commodity charges.

In the 2021 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. In the 2022 plan, both the residential and income eligible models were split into all programs, all programs without Home Energy Reports (HERs), and HERs only. Therefore, the 2022 plan has a total of nine separate electric models. For all models, the key inputs are the net planned participation and savings numbers from Table E-7 in Attachment 5.<sup>1</sup> 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.<sup>2</sup> The diversity seen within the commercial customer profile indicates 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.<sup>3</sup>

In the 2021 plan, annual net energy savings and annual net participants were assumed constant until the lifetime net energy savings were reached. In the 2022 plan, annual savings and participants reflect the phasing-out of individual programs. For example, HERs is a one-year program that only covers 2022. Now, the savings and participants attributed to HERs are removed from annual savings and participants calculations starting in 2023.

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<sup>1</sup> The 2022 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.

<sup>2</sup> 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.

<sup>3</sup> Savings and participation modeled by C&I rate classes is partitioned and estimated based on historical data.

In the 2021 plan, long-term average changes in rates and bills were calculated by averaging all non-zero annual values in the study period (2021-2040). In the 2022 plan, these averages now include zero and non-zero values in the study period (2022-2041).

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            |
|                            |                | Residential Consumer Products     |
| Income Eligible Electric   | A-60           | Income Eligible Single Family     |
|                            |                | Income Eligible Multifamily       |
|                            |                | Home Energy Reports               |
| 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 10, and general highlights are presented after. The columns in the tables are as follows:

- Long-term rate impacts, defined as the percentage change in average rates from 2022 to 2041
- Typical energy savings, which refer to the average percentage of energy savings to total annual consumption from 2022 to 2041 (negative numbers indicate electricity consumption reduction)
- Typical bill savings, defined as the percentage change in average customer bills from 2022 to 2041 (negative numbers indicate electricity bill reduction)

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.<sup>4</sup> Average customers combine the bill impacts of EE participants and non-EE

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<sup>4</sup> As alluded to in section 3.1, residential and income eligible results are split into all programs, all programs without HERs, and HERs only.

customers to show the impacts of all customers combined. For the 2022 Bill Impact analysis, the key finding is that over the proposed lifetimes of 2022 programs, the average participant’s bill and the average customer’s bill will not be higher than a scenario with no programs.

*Table 2. Residential All Programs – Rate and Bill Impact Analysis – A-16 (2022 EE Plan vs. No EE)*

| Residential (All Programs) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|----------------------------|------------------------|------------------------|----------------------|
|                            | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant        | 0.30%                  | -3.69%                 | -5.50%               |
| Non-Participant            | 0.30%                  | 0.00%                  | 0.30%                |
| Average Customer           | 0.30%                  | -0.64%                 | -0.02%               |

*Table 3. Residential All Programs w/o HERs – Rate and Bill Impact Analysis – A-16 (2022 EE Plan vs. No EE)*

| Residential (All Programs w/o HERs) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|-------------------------------------|------------------------|------------------------|----------------------|
|                                     | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant                 | 0.31%                  | -4.02%                 | -5.60%               |
| Non-Participant                     | 0.31%                  | 0.00%                  | 0.31%                |
| Average Customer                    | 0.31%                  | -0.50%                 | 0.05%                |

*Table 4. Residential All Programs HERs Only – Rate and Bill Impact Analysis – A-16 (2022 EE Plan vs. No EE)*

| Residential (HERs Only) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|-------------------------|------------------------|------------------------|----------------------|
|                         | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant     | 0.01%                  | -0.19%                 | -0.05%               |
| Non-Participant         | 0.01%                  | 0.00%                  | 0.01%                |
| Average Customer        | 0.01%                  | -0.13%                 | -0.03%               |



Table 5. Income-Eligible All Programs – Rate and Bill Impact Analysis – A-60 (2022 EE Plan vs. No EE) <sup>5</sup>

| Income-Eligible (All Programs) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|--------------------------------|------------------------|------------------------|----------------------|
|                                | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant            | 0.59%                  | -9.64%                 | -6.74%               |
| Non-Participant                | 0.59%                  | 0.00%                  | 0.59%                |
| Average Customer               | 0.59%                  | -2.41%                 | -0.97%               |

Table 6. Income-Eligible All Programs w/o HERs – Rate and Bill Impact Analysis – A-60 (2022 EE Plan vs. No EE)

| Income-Eligible (All Programs w/o HERs) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|---|------------------------|------------------------|----------------------|
|   | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant                     | 0.55%                  | -10.53%                | -7.16%               |
| Non-Participant                         | 0.55%                  | 0.00%                  | 0.55%                |
| Average Customer                        | 0.55%                  | -2.28%                 | -0.96%               |

Table 7. Income-Eligible HERs Only – Rate and Bill Impact Analysis – A-60 (2022 EE Plan vs. No EE)

| Income-Eligible (HERs Only) | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|-----------------------------|------------------------|------------------------|----------------------|
|                             | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant         | 0.01%                  | -0.16%                 | -0.05%               |
| Non-Participant             | 0.01%                  | 0.00%                  | 0.01%                |
| Average Customer            | 0.01%                  | -0.13%                 | -0.04%               |

Table 8. Small Commercial – Rate and Bill Impact Analysis – C-06 (2022 EE Plan vs. No EE)<sup>6</sup>

| Small Commercial    | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|---------------------|------------------------|------------------------|----------------------|
|                     | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant | 0.41%                  | -16.20%                | 8.57%                |
| Non-Participant     | 0.41%                  | 0.00%                  | 0.41%                |
| Average Customer    | 0.41%                  | -1.50%                 | -0.42%               |

<sup>5</sup> HERs participation and savings are split between standard residential and income-eligible customers, since this measure reaches all residential customers. For analysis purposes, HERs participation and savings 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 the program.

<sup>6</sup> For 2022, as in the 2021 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.

Table 9. Medium Commercial – Rate and Bill Impact Analysis – G-02 (2022 EE Plan vs. No EE)

| Medium Commercial   | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|---------------------|------------------------|------------------------|----------------------|
|                     | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant | 0.28%                  | -9.58%                 | -5.01%               |
| Non-Participant     | 0.28%                  | 0.00%                  | 0.28%                |
| Average Customer    | 0.28%                  | -1.47%                 | -0.53%               |

Table 10. Large C&I – Rate and Bill Impact Analysis – G-32, G-62 (2022 EE Plan vs. No EE)

| Large Commercial    | Long-Term Rate Impacts | Typical Energy Savings | Typical Bill Savings |
|---------------------|------------------------|------------------------|----------------------|
|                     | (% of Total Rate)      | (% per Participant)    | (% of Total Bill)    |
| Average Participant | 0.21%                  | -2.77%                 | -2.57%               |
| Non-Participant     | 0.21%                  | 0.00%                  | 0.21%                |
| Average Customer    | 0.21%                  | -2.00%                 | -1.00%               |

For all residential and income eligible customers, rates and non-participant bills increase while participant bills decrease. For residential customers, average customer bills are flat for all programs, slightly increase for all programs without HERs, and slightly decrease for HERs only. For income eligible customers, average customer bills decrease in all three models.

For all commercial customers, long-term rates and non-participant bills increase while participant and average customer bills decrease. The consistent reduction in average customer bills demonstrates that the energy savings associated with participation in EE programs outweighs the incremental costs required for implementation.

- *Residential long-term rate impact:* EE programs bring system benefits by way of avoided infrastructure investment in generation, transmission, and distribution. These avoided investments will ultimately flow through rates and offset the short-term contribution of the 2022 EE program charge. Long-term rates will drop over time to the values shown in tables 2-7.
- *Small, medium, and large commercial long-term rate impact:* Avoided infrastructure costs flow through rates and offset the 2022 EE program charge, leading to long-term rate increases of 0.41%, 0.28%, and 0.21% for small, medium, and large commercial customers respectively.
- *Average participant bill savings:* The proposed EE programs will provide bill savings to participants in all rate groups.
- For the 2022 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:* The proposed EE programs will provide bill savings to participants in all rate groups except residential all programs without HERs (0.05% change). For

the majority of customers, the proposed EE programs will provide positive net benefits (Tables 2-10).

For both residential and C&I electric customers, these bill impact calculations and results do not include water and other fuel impacts that may be associated with electric energy efficiency projects and which may impact the bills for those resources. Such an analysis is beyond the scope of the electric model which is specifically designed to study the impacts of the costs of electric programs on electric customers’ rates and bills. Qualitatively, to the extent that a customer’s consumption of other resources is reduced by participation in an electric energy efficiency program, their bills for that resource will be reduced.

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 11.

*Table 11. Average Annual Consumption per Customer in Modeled Customer Classes<sup>7</sup>*

| <b>Modeled Customer Class</b>       | <b>Average Annual Per-Customer Consumption (kWh/year)</b> |
|-------------------------------------|---|
| Residential (A-16) All Programs     | 6,412   |
| Income Eligible (A-60) All Programs | 6,377   |
| Small C&I (C-06)                    | 38,362  |
| Medium C&I (G-02)                   | 157,523   |
| Large C&I (G-32 and G-62)           | 2,281,966   |

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.

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<sup>7</sup> 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 1. Example of Typical Residential (A-16) Participant and Customer Annual Electric Bill Impact (2022 EE Plan vs. No EE)

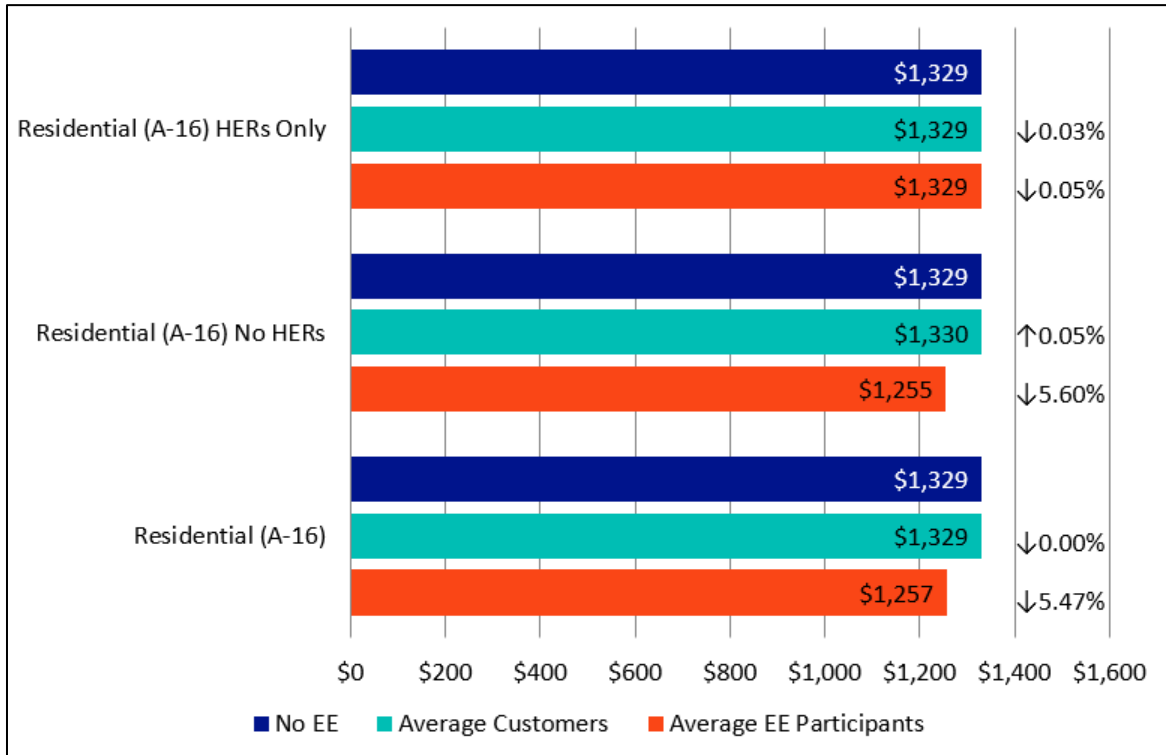


Figure 2. Example of Typical Income Eligible (A-60) Participant and Customer Annual Electric Bill Impact (2022 EE Plan vs. No EE)

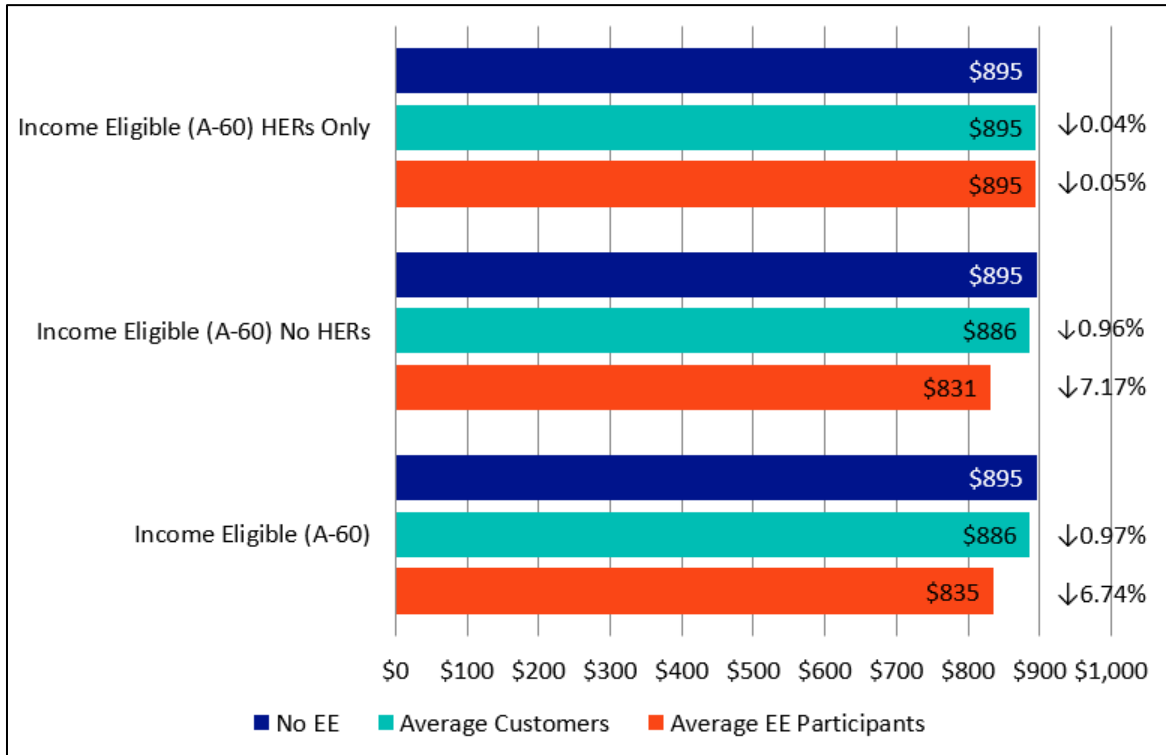


Figure 3. Example of Typical Small C&I (C-06) Participant and Customer Annual Electric Bill Impact (2022 EE Plan vs. No EE)

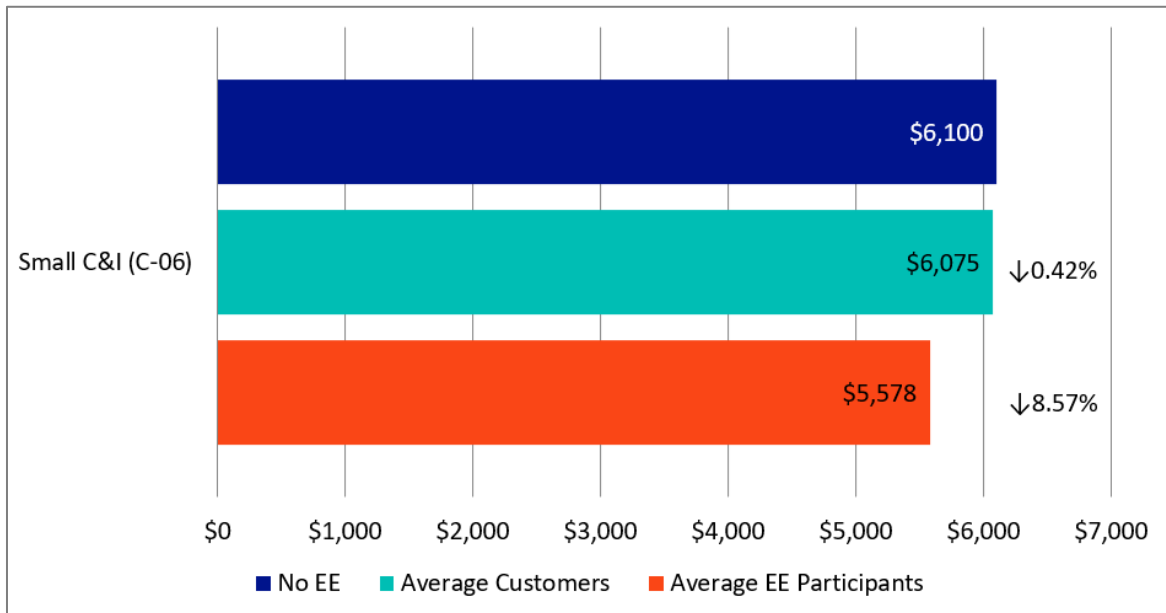


Figure 4. Example of Typical Medium C&I (G-02) Participant and Customer Annual Electric Bill Impact (2022 EE Plan vs. No EE)

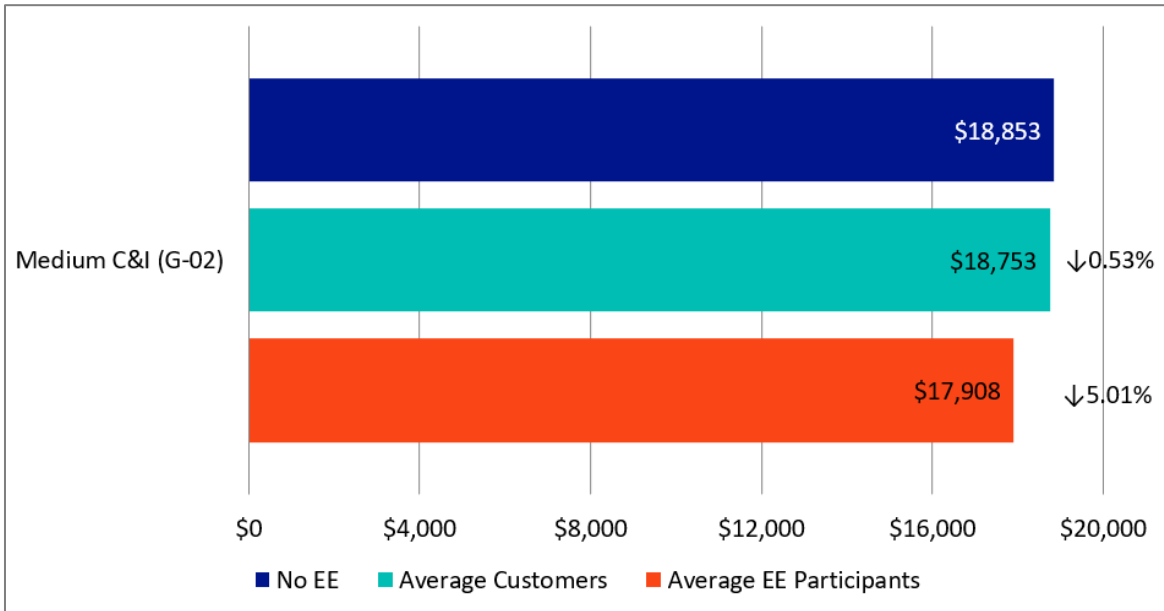
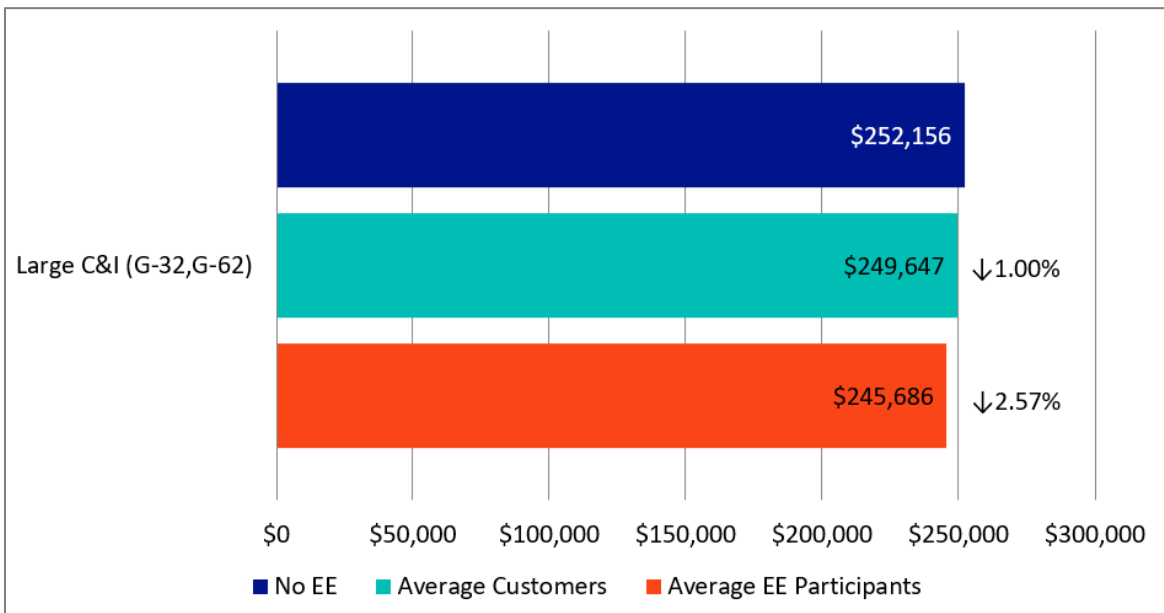


Figure 5. Example of Typical Large C&I (G-32, G-62) Participant and Customer Annual Electric Bill Impact (2022 EE Plan vs. No EE)



## 4 Gas Bill and Rate Impacts

### 4.1 Model Background

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.<sup>8</sup> The 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 2022 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

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<sup>8</sup> The Synapse study introducing this modeling tool is filed in [Docket 5076](http://www.ripuc.ri.gov/eventsactions/docket/5076%20National%20Grid%20EEP%20&%203-Yr%20EEP/1%20Synapse%20RI%20Gas%20RBI%20Report%2010_2_20.pdf): [http://www.ripuc.ri.gov/eventsactions/docket/5076%20National%20Grid%20EEP%20&%203-Yr%20EEP/1%20Synapse%20RI%20Gas%20RBI%20Report%2010\\_2\\_20.pdf](http://www.ripuc.ri.gov/eventsactions/docket/5076%20National%20Grid%20EEP%20&%203-Yr%20EEP/1%20Synapse%20RI%20Gas%20RBI%20Report%2010_2_20.pdf)

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 (MMBTU). 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 (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 on an annual basis 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 (\$/Therm): Natural Gas rates for customer classes modeled: residential, income eligible, small C&I and large C&I. The rates are averaged from the prevailing rates on September 1, 2020, November 1, 2020, January 1, 2021, April 1, 2021, and May 1, 2021 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 June 2021 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 2022 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 0.33% and 0.77% due to the 2022 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 2022 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 2.61% and 23.55%.

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.<sup>9</sup>

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 covered by the analysis is determined by the average measure life of the longest program included which equates to 24 years due to EnergyWise's 23-year measure life and the inclusion of an additional buffer year. The same value of 24 years is applied to each sector and each program within a sector. This is not to suggest that all measures have a measure life of 24 years. Each measure has its own measure life assumption. However, as the study period assumption is applied to all programs, a period is selected that is long enough to capture all the savings from all measures in all sectors. Consequently, the model instance analyzing the Home Energy Report program in isolation models savings only over one year (a much shorter period compared to the other two model instances as mentioned earlier). Therefore, 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.

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<sup>9</sup> Customers who are not served by the HER program are only excluded due to reasons of evaluability, that is, to assess the savings in a statistically valid way, a control group of sufficient size is required.

When the remaining four residential programs are assessed together, the results show that participants see an average reduction of 4.72% on their bills over the long term, while average customers see a 0.26% increase, and non-participants see an increase of 0.46%. The EnergyWise, EnergyStar HVAC, 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 (0.15%) 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, which involves including the large pool of HER participants, through the duration of the modeling period (24 years). The savings for all the residential programs are therefore spread across a large group of participants, minimizing their impact, and resulting in a conservative assessment of participants' bill impacts.<sup>10</sup>

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 instances as shown below.

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<sup>10</sup> As a sensitivity test, the model was adjusted to allow the count of participants vary by year, depending on when the savings, and consequently participants, drop off from programs due to measure lives. This sensitivity analysis shows the average participant's long-term average change in bills to be -6.54%.

Table 12. Summary of Rate and Bill Changes due to the 2022 Proposed Natural Gas Energy Efficiency Portfolio<sup>11</sup>

| Sector  | Levelized net change in rates due to 2022 Programs | Long Term Average Change in Bills |                  |                     |
|---|--|-----------------------------------|------------------|---------------------|
|   |  | Non-Participants                  | Average Customer | Average Participant |
| Residential (Model 1: HERs only)                | 0.02%  | 0.02%                             | 0.00%            | -0.01%              |
| Residential (Model 2: All Programs Except HERs) | 0.47%  | 0.46%                             | 0.26%            | -4.72%              |
| Residential (Model 3: All Programs)             | 0.49%  | 0.48%                             | 0.25%            | 0.15%               |
| Income Eligible                                 | 0.77%  | 0.77%                             | -0.17%           | -4.28%              |
| Small C&I                                       | 0.33%  | 0.32%                             | 0.19%            | -23.55%             |
| Large C&I                                       | 0.48%  | 0.47%                             | 0.02%            | -2.61%              |

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 June 2021, 210,641 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2021.

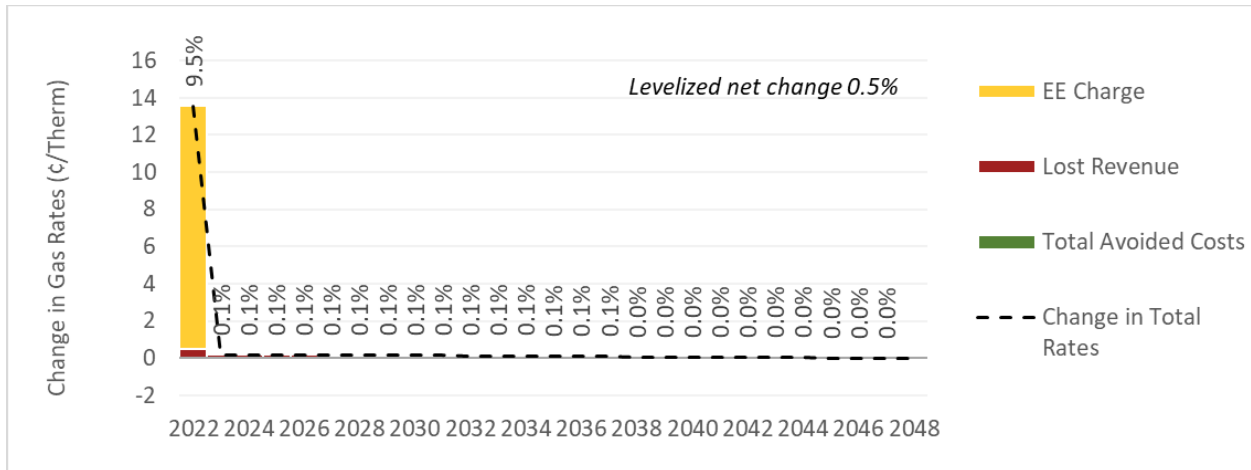
##### 4.3.1.1 Residential Rates

For the residential sector the 2022 Plan creates a levelized net change in rates of 0.5% (Figure 6) compared to the counterfactual with no energy efficiency.

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<sup>11</sup> Rate impact is the same as the non-participant bill impact, since non-participants have no savings to offset the change in rates. Some values for these two categories differ slightly due to rounding in the model.

Figure 6. Change in Rates: Proposed EE vs No EE for the 2022 Plan - 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 illustrate 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. 2022 Long-Term Levelized Average Change in Annual Bills – Residential, HER Program Only

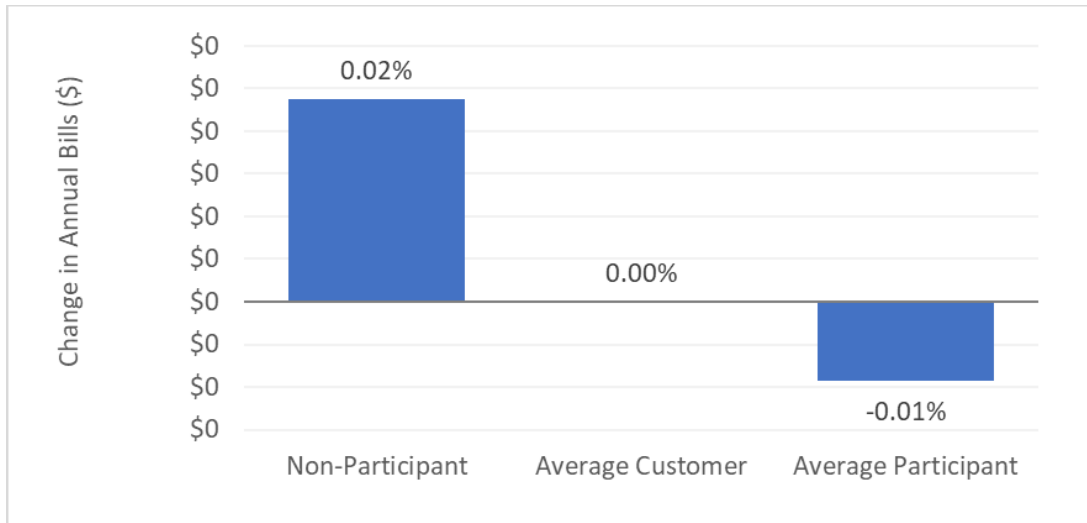
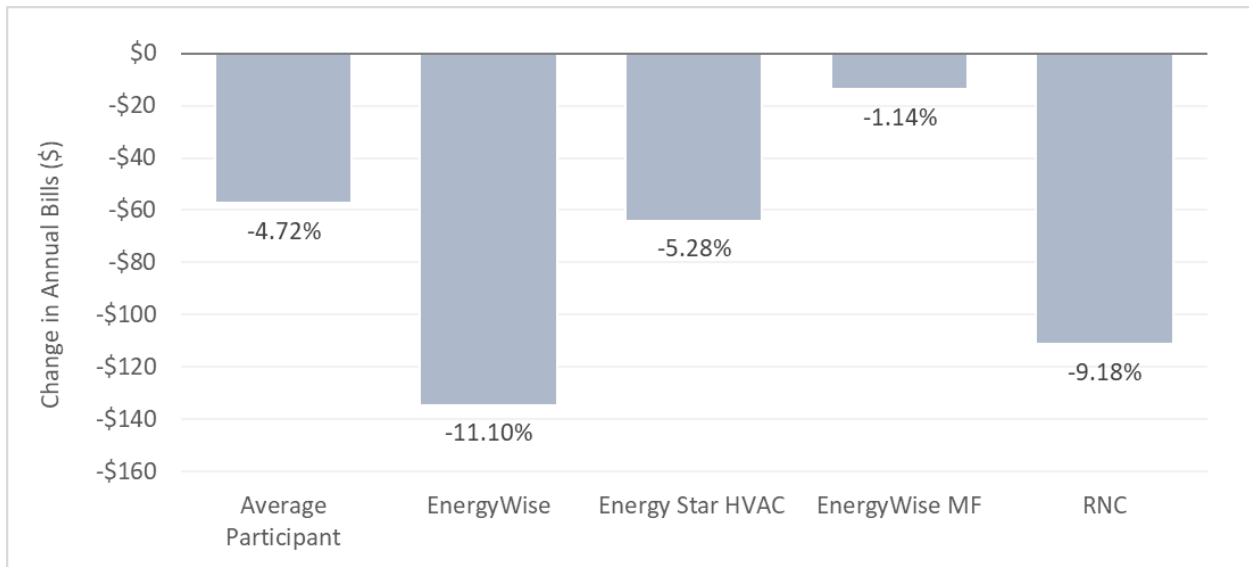


Figure 8 shows the long-term average bill change for program participants in the EnergyWise, Energy Star HVAC, EnergyWise Multi-family, and Residential New Construction programs. The average bill savings range from 1.14% to 11.10% among these programs.

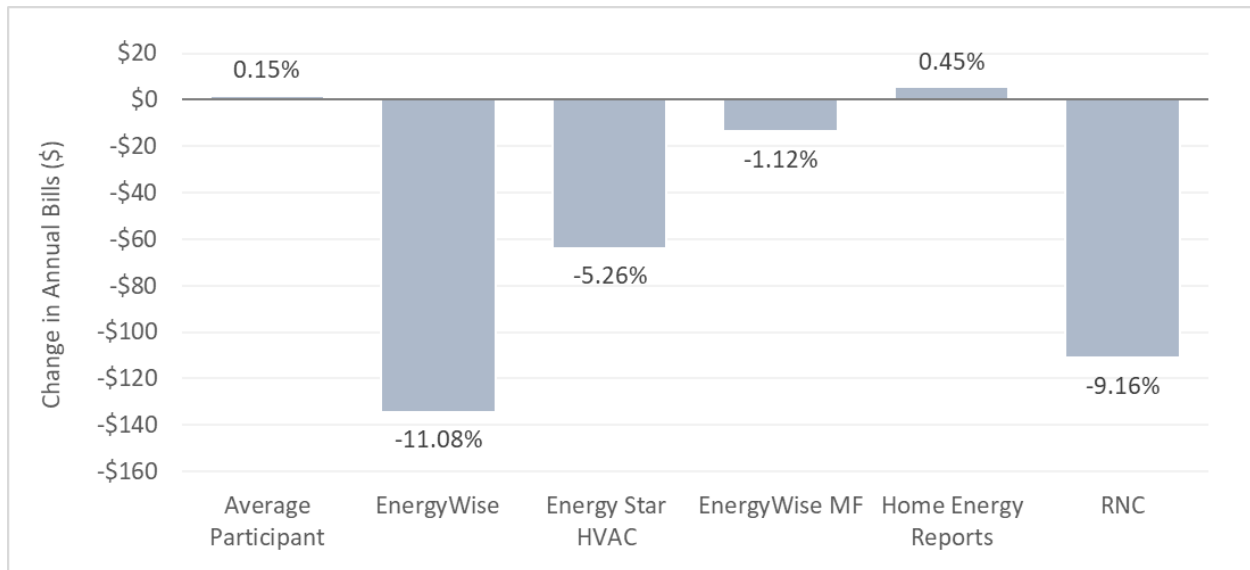
Figure 8. 2022 Long-Term Levelized Average Change in Annual Bills by Program Participants – Residential, HER Excluded



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. 2022 Long-Term Levelized Average Change in Annual Bills by Program Participants – All Residential



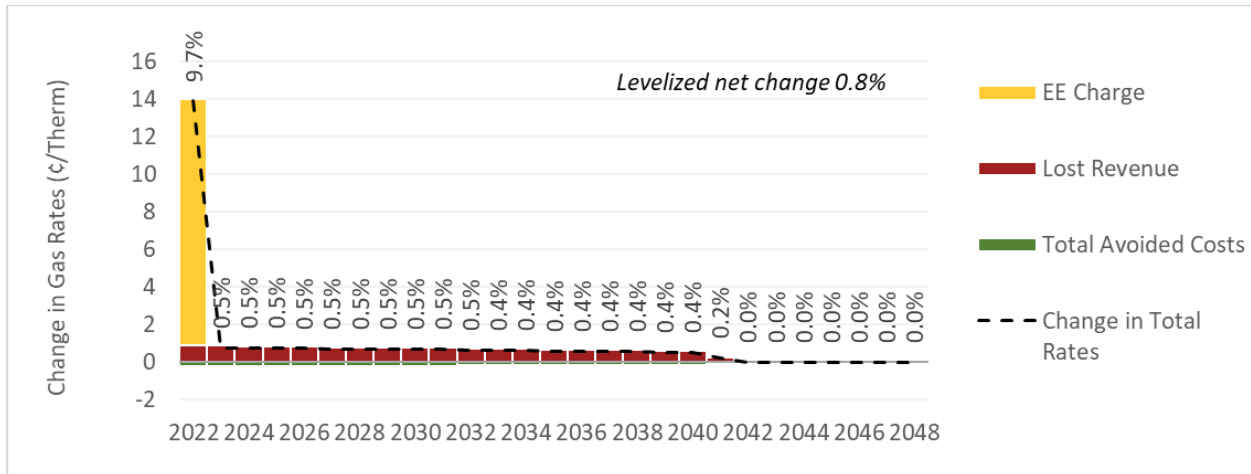
#### 4.3.2 Income Eligible

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 June 2021, 19,978 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2021.

##### 4.3.2.1 Income Eligible Rates

The 2022 programs addressing the income eligible market are projected to result in a 0.8% 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.

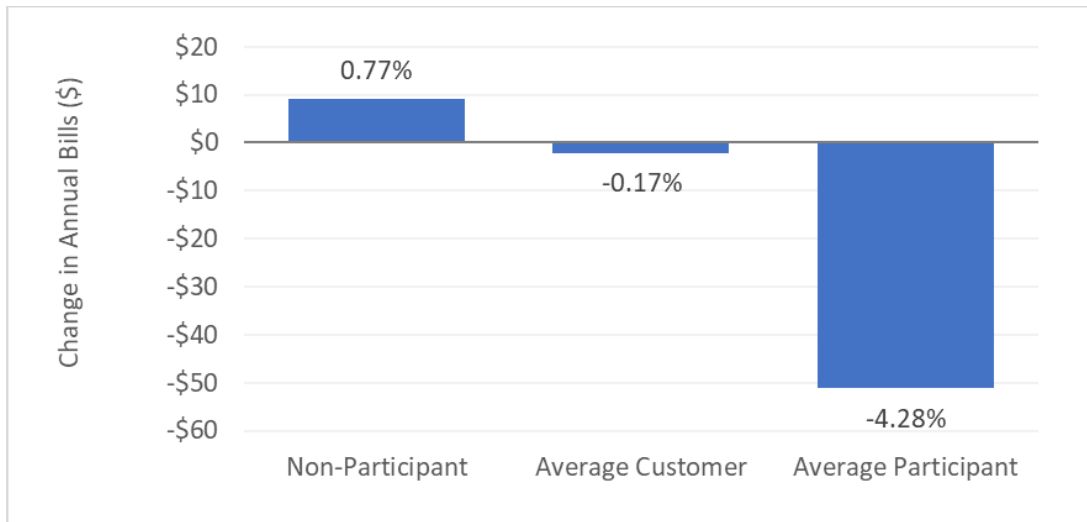
Figure 10. Change in Rates: Proposed EE vs No EE for the 2022 Plan – Income Eligible



4.3.2.2 Income eligible Bills

The income eligible programs planned in the 2022 plan will result in a long-term average reduction in bills for participating customers of 4.28% on average. Average customers will see a 0.17% reduction in annual bills and non-participants will see a 0.77% increase in bills.

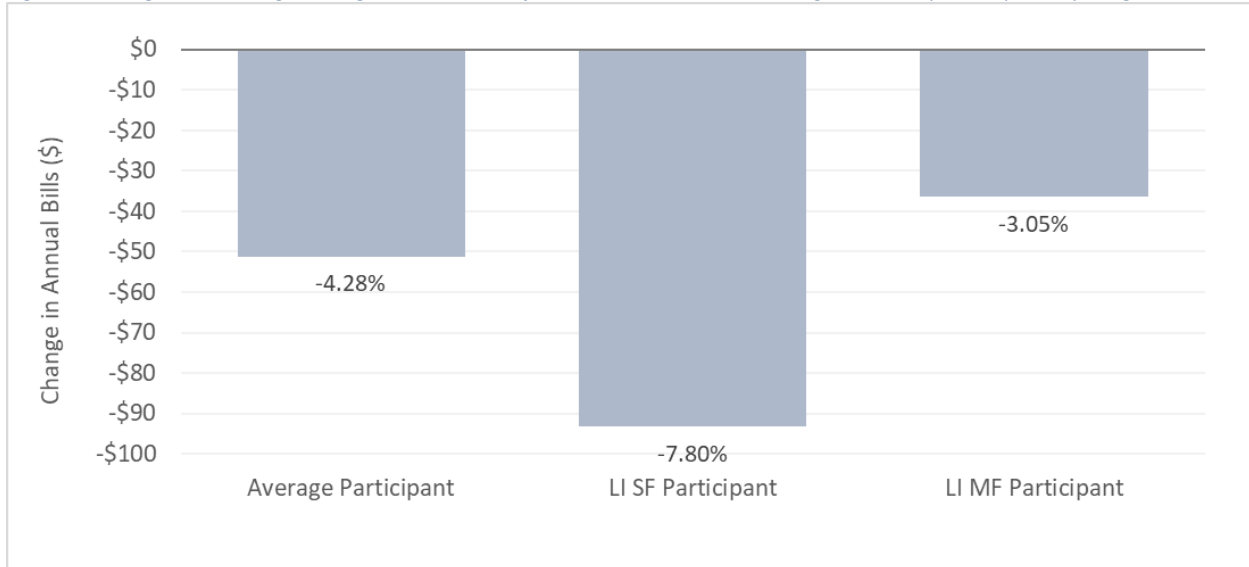
Figure 11. Long-Term Average Change in Annual Bills for the 2022 Plan– Income eligible Customer Group



Analyzing each program individually, participants in the single-family income eligible program will see an average of 7.80% reduction in annual bills due to their 2022 participation, while multi-family income eligible participants will see an average 3.05% reduction in annual bills over the long-term.



Figure 12. Long-Term Average Change in Annual Bills for the 2022 Plan– Income Eligible Participant Impacts by Program



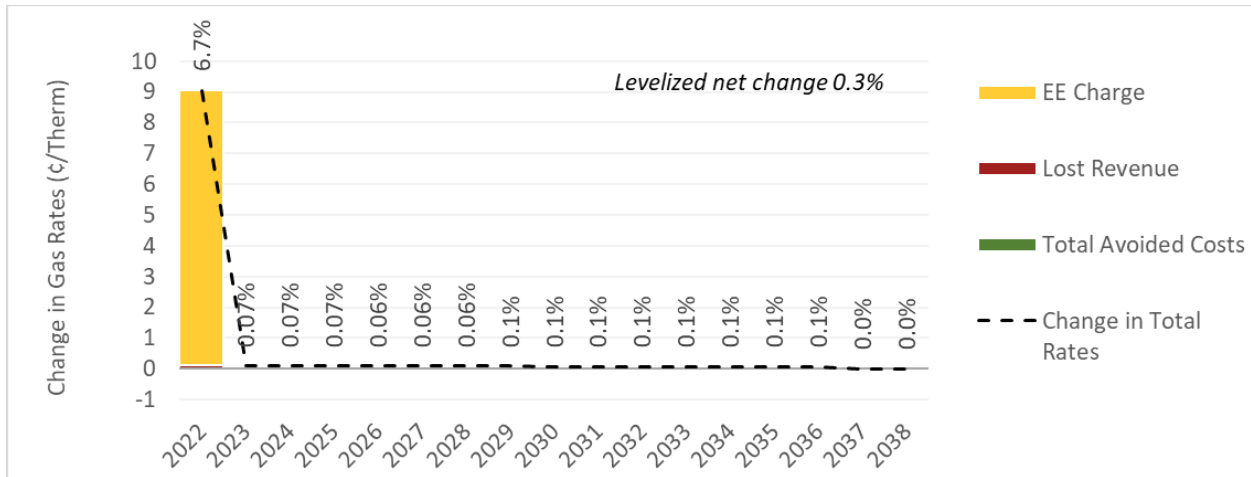
#### 4.3.3 Small Commercial and Industrial

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 June 2021, 19,091 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2021.

##### 4.3.3.1 Small Commercial and Industrial Rates

The 2022 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).

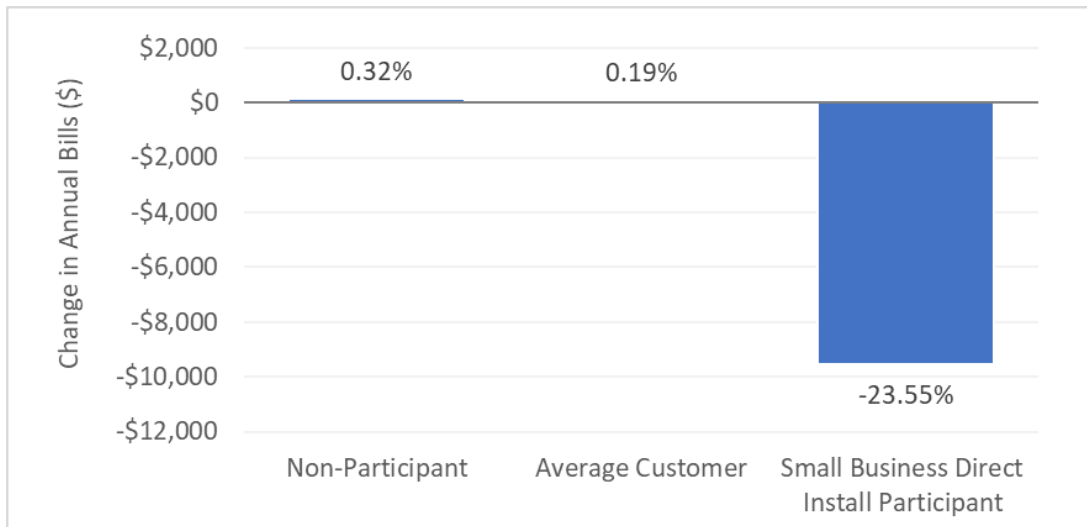
Figure 13. Change in Rates: Proposed EE vs No EE for the 2022 Plan – Small Commercial and Industrial



#### 4.3.3.2 Small Commercial and Industrial Bills

The Small Commercial and Industrial program will result in an average annual bill reduction of 23.55% for participants in the Small Business Direct Install program (Figure 14).

Figure 14. Long-Term Average Change in Annual Bills for the 2022 Plan– Small Commercial and Industrial



#### 4.3.4 Large Commercial and Industrial

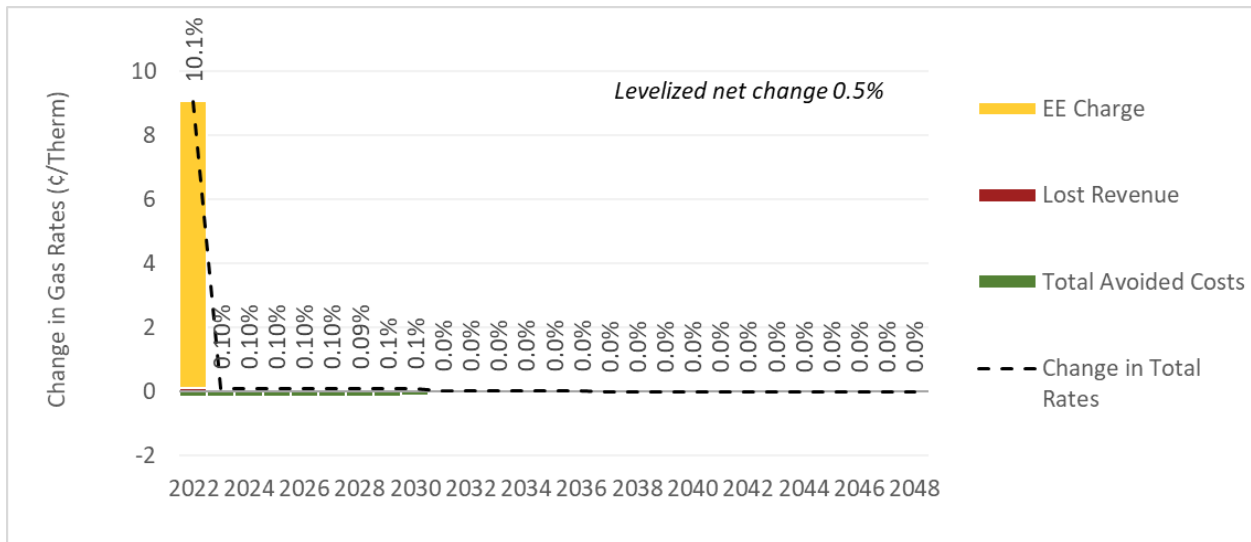
The Large Commercial and Industrial sector is modeled using rates from Rate Classes 22, 33, 23, 34, and 24. The rate and bill impacts for this sector are modeled for the Commercial New Construction, Commercial Retrofit, and Commercial Multi-family programs. The Large Commercial and Industrial sector is modeled using an annual consumption figure of 544,429 therms per year, of which 300,304

therms are winter usage and 244,125 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 June 2021, 5,879 accounts, and projected forward based on observed compound annual growth rate of customers in this rate class between 2016 and 2021. 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 2022 programs addressing the large C&I market are projected to result in a 0.5% levelized increase in rates for the commercial and industrial sector.

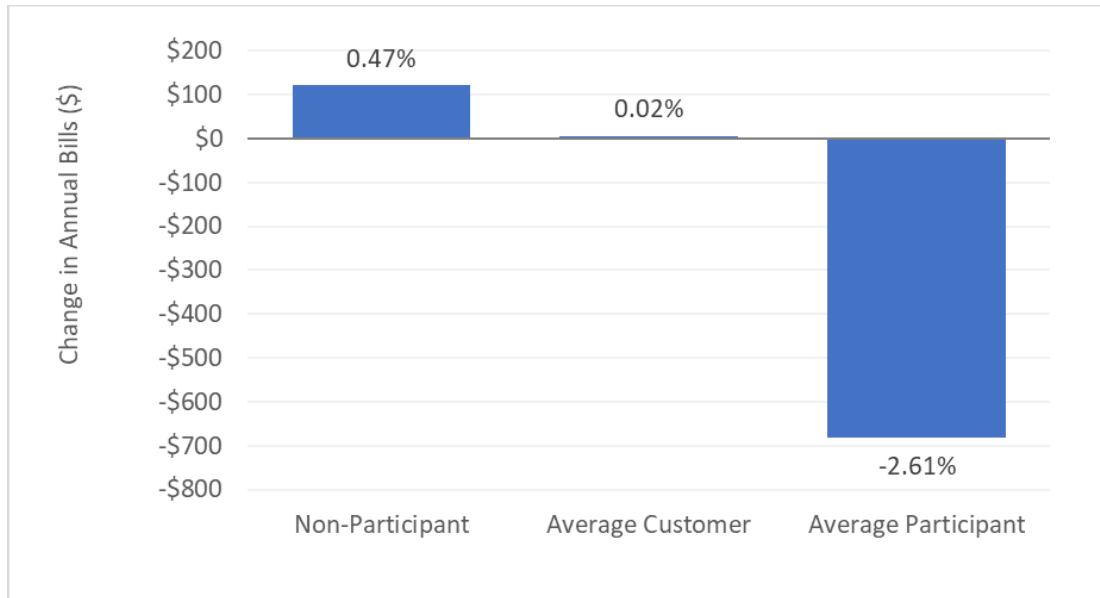
Figure 15. Change in Rates: Proposed EE vs No EE for the 2022 Plan – Large Commercial and Industrial



**4.3.4.2 Large Commercial and Industrial Bills**

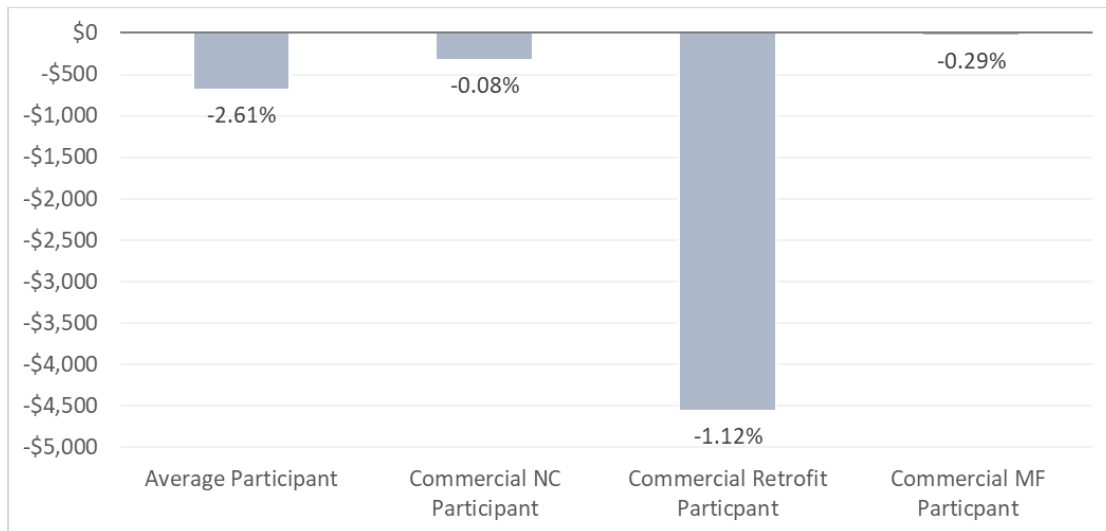
The large commercial and industrial programs will result in an average annual bill reduction of 2.61% for participants.

Figure 16. Long-Term Average Change in Annual Bills for the 2022 Plan– Large Commercial and Industrial Group



Analyzing each program individually, commercial retrofit participants will see a reduction of 1.12%, while participants in the commercial new construction program and the commercial multi-family programs will see smaller reductions in their bills with changes of 0.08% and 0.29%, respectively.

Figure 17. Long-Term Average Change in Annual Bills for the 2022 Plan– Large Commercial and Industrial Participant 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 2022 gas portfolio overall has a BC ratio of 2.74 under the RI Test and cost of supply analysis shows that the cost of energy efficiency is \$18.9 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 in the future, 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.



## 2022 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 offerings to expand energy efficiency choices and benefits to customers. The Company continues to implement new measures and solutions that were proposed in the 2021 Annual Plan and has proposed additional demonstrations and assessments for the 2022 Annual Plan. The Company has developed a framework to assess and test new innovations for the energy efficiency and active demand response portfolios and used this framework to develop the solutions included in the 2022 Annual Plan.

**Process:** The Company has developed a standard process by which it tests all new ideas and determines if the idea merits a pilot, 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.

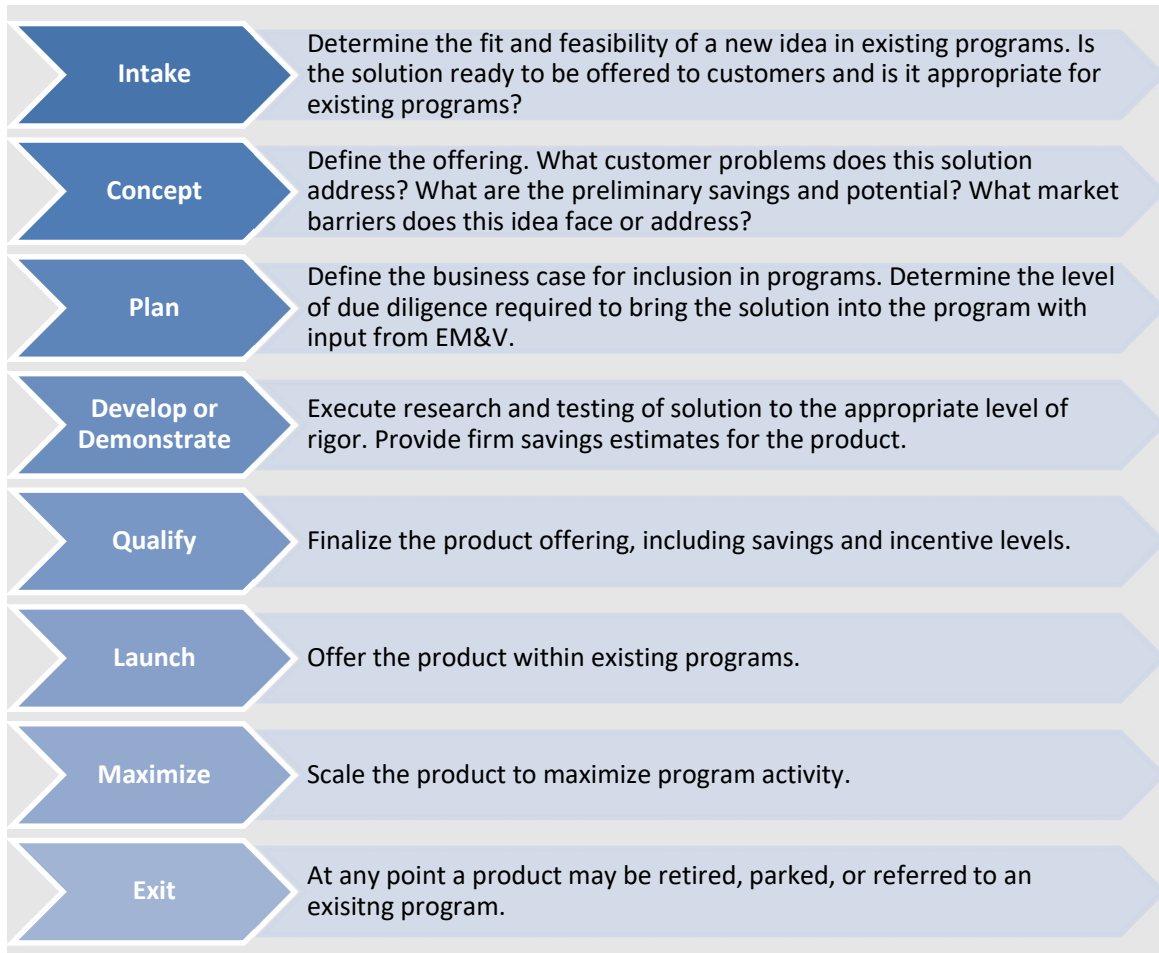
The Concept stage necessitates preliminary research and analysis of the product, which will inform the **Plan** stage. Key decisions of how to progress with the solution are made during the Plan stage, including if a pilot, demonstration, or assessment is required to develop the idea and, if so, whether 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 2022. 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 Company's Customer Energy Management (CEM) team, 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.



**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. Ideas for new product inclusion come from many places and the Company collects them from the following, though not exhaustive, sources; customers, vendors, contractors, supply-chain actors, industry research entities, other program administrators, and many more. 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 2022. 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                                     | <ul style="list-style-type: none"> <li>• May result in independent program</li> <li>• Long term and comprehensive engagement required to test and develop offering</li> <li>• Market capabilities may need to be developed</li> </ul> | <ul style="list-style-type: none"> <li>• Technology requires information gathering and field installations</li> </ul> | <ul style="list-style-type: none"> <li>• Technology addresses program need that can't be met with other, more certain solutions</li> <li>• Technology does not have a robust basis for energy savings</li> </ul> |
| 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.”<sup>1</sup>

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

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<sup>1</sup> 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 relate to oversight and coordination with the RI EM&V framework described 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 Pilots, Demonstrations and Assessments

The following pilots’ demonstrations and assessments are proposed for 2022 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       |
| <b>Demonstrations</b>  |       |  |              |           |                   |                              |                  |
| <b>Industrial</b>  | Dual  | Continuous Energy Improvement (CEI)        | C&I Retrofit | 2018-2022 | \$ 197,867        | 460 MWh (projected for 2022) | Vendor           |
| <b>Lighting</b>  | Dual  | Network Lighting Controls Plus HVAC (NLC+) | C&I Retrofit | 2020-2022 | \$ 124,841        | 1.44 kWh/SF                  | Vendor           |
| <b>HVAC</b>  | Dual  | Smart Valves                               | C&I Retrofit | 2021-2022 | \$ 97,823         | 300 MWh (projected for 2021) | Vendor           |
|  | Dual  | Air Curtains                               | C&I Retrofit | 2022      | \$ 97,389         | 14 MWh (potential)           | Vendor           |
|  | Dual  | Automated RTU Optimization                 | Allocated    | 2022-2023 | \$ 18,633         | 115 kWh/ton cooling          | Independent      |
| <b>Refrigeration</b>   | Elec. | Grocery Refrigerant Survey and Repair      | C&I Retrofit | 2022      | \$ 49,688         | 5-10%                        | Vendor           |
| <b>Innovation Pipeline**</b>   | Elec. | Innovative Electric                        | Allocated    | 2022      | \$ 31,055         | To be estimated              | To be determined |
| <b>Assessments</b>   |       |  |              |           |                   |                              |                  |
| <b>Active Demand Response</b>  | Elec. | Building Flexibility through DR            | C&I Retrofit | 2022      | \$ 24,844         | Unknown                      | Internal Review  |
| <b>HVAC</b>  | Elec. | Rightsizing RTUs                           | Allocated    | 2022      | \$ 12,422         | Unknown                      | Internal Review  |
| <b>Total Electric C&amp;I Demonstration</b>                                |       |  |              |           | <b>\$ 617,296</b> |                              |                  |
| <b>Total Electric C&amp;I Assessments</b>                                  |       |  |              |           | <b>\$ 37,266</b>  |                              |                  |

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       |
| <b>Pilot</b>  |      |  |                       |           |                   |   |                  |
| <b>Active Demand Response</b>   | Gas  | Gas Demand Response Pilot                  | N/A                   | 2022      | \$ 215,780        | 27,520 Therms (projected for 2022)            | Vendor           |
| <b>Demonstrations</b>   |      |  |                       |           |                   |   |                  |
| <b>Industrial</b>   | Dual | Continuous Energy Improvement (CEI)        | C&I Retrofit          | 2018-2022 | \$ 93,114         | 3,133 Therms (projected for 2022)             | Vendor           |
| <b>HVAC</b>   | Dual | Network Lighting Controls Plus HVAC (NLC+) | C&I Retrofit          | 2020-2022 | \$ 61,489         | 0.012 Therms/sqft                             | Vendor           |
|   | Dual | Smart Valves                               | C&I Retrofit          | 2021-2022 | \$ 32,608         | 23,000 Therms (projected for 2021)            | Vendor           |
|   | Gas  | Gas Heat Pumps                             | C&I New Construct-ion | 2021-2022 | \$ 223,596        | 15,000-20,000 Therms (for a 400-600 mbh unit) | Vendor           |
|   | Dual | Air Curtains                               | C&I Retrofit          | 2022      | \$ 97,389         | 252 MMBtu (potential)                         | Vendor           |
|   | Dual | Automated RTU Optimization                 | Allocated             | 2022-2023 | \$ 18,633         | 10-20%  | Independent      |
| <b>Innovation Pipeline**</b>  | Gas  | Innovative Gas                             | Allocated             | 2022      | \$ 31,055         | To be estimated                               | To be determined |
| <b>Assessments</b>  |      |  |                       |           |                   |   |                  |
| <b>HVAC</b>   | Dual | Rightsizing RTUs                           | Allocated             | 2022      | \$ 12,422         | Unknown                                       | Internal Review  |
| <b>Total Gas C&amp;I Pilots</b>   |      |  |                       |           | <b>\$ 215,780</b> |   |                  |
| <b>Total Gas C&amp;I Demonstrations</b>                                       |      |  |                       |           | <b>\$ 557,883</b> |   |                  |
| <b>Total Gas C&amp;I Assessments</b>  |      |  |                       |           | <b>\$ 12,422</b>  |   |                  |

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       |
| <b>Demonstration</b>   |       |  |                             |           |                   |                    |                  |
| HVAC   | Dual  | New Air Sealing and Insulation Products    | EnergyWise                  | 2021-2022 | \$ 24,844         | 0.05 kWh/sqft      | Vendor           |
| Active Demand Response                                       | Elec. | Solar Inverter Direct Load Control         | Residential Demand Response | 2021-2022 | \$ 44,380         | 102.5 kWh/inverter | Independent      |
| **Innovation Pipeline  | Elec. | Innovation Electric                        | Allocated                   | 2020      | \$ 31,055         | To be estimated    | To be determined |
| <b>Assessments</b>   |       |  |                             |           |                   |                    |                  |
| New Construction   | Elec. | Closing the Gas Gap for All Electric Homes | RNC                         | 2022      | \$ 24,844         | Unknown            | Internal Review  |
| <b>Total Electric Residential Demonstration</b>              |       |  |                             |           | <b>\$ 100,279</b> |                    |                  |
| <b>Total Electric Residential Assessments</b>                |       |  |                             |           | <b>\$ 24,844</b>  |                    |                  |

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  |
| <b>Demonstrations</b>                                   |      |   |                     |           |                   |                    |             |
| HVAC  | Dual | New Air Sealing and Insulation Products | EnergyWise          | 2021-2022 | \$ 74,532         | 0.1 Therm/sqft     | Vendor      |
|   | Gas  | Gas Heat Pumps                          | HVAC                | 2021-2022 | \$ 99,376         | 250 Therms/unit    | Independent |
| Innovation Pipeline**                                   | Gas  | Innovation Gas                          | Allocated           | 2022      | \$ 31,055         | To be estimated    | Independent |
| <b>Total Gas Residential Demonstration</b>              |      |   |                     |           | <b>\$ 204,963</b> |                    |             |

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 or 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 1<sup>st</sup> to March 31<sup>st</sup>). 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 2020/21 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 supply and/or 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. The Aquidneck Island Long-Term Gas Capacity report (released in Sept-2020) reviewed the benefits of DR, among other solutions, to address localized constraints. The report looked at benefits both from a Utility Implementation Cost and a Net Rhode Island Costs which utilized the principles of RI Benefit Cost Test.

Avoided Cost values in that latter test primarily relied on the 2018 AESC values. The Company has since initiated a follow-up study to the 2021 AESC Study to look more closely at potential Peak Day winter gas costs. 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 40-50 dekatherms (DTh) of hourly peak reduction in the winter of 2021/22, 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.

**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 supply and/or distribution system benefits?
- What is the scalability of the program?
- Can customers that temporarily shift their gas usage outside of peak hours maintain some daily gas usage reductions?

**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.

**Peak-Period Demand Response (PPDR):** For winter 2021/22, the Company expects to increase participation in PPDR by adding one to two new customers on top of the two customers that participated in 2020/21. Many pilot parameters will remain similar to the terms of the pilot offering launched during the winter of 2020/21:

- 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 incentives— 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 prior years, customer compensation for participation in the PPDR pilot offering will be based on a combination of ‘reservation’ 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. The Company will continue to utilize a rolling performance rating that measures customer reliability and limits payments to non-performing resources.

**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. 1<sup>st</sup> through March 31<sup>st</sup>). 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 ‘reservation’ 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 ‘reservation’ incentives will be subject to a performance rating based on a measurement of customer reliability.

**Evaluation:** Vendor Evaluation

**Changes in 2022:** The Gas Peak Period Demand Response and Extended Demand Response pilot offerings will continue in the winter of 2021/22. 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.

| 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). | Advances. 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.  | Advances. 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.  | Advances. 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. Providing alternatives to gas infrastructure may also provide indirect benefits for combatting climate change. |
| 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.   | Advances. Gas DR pilot advances this goal by putting incentives towards peak reduction on the gas distribution network that may help to achieve the GHG reduction goals of the Resilient Rhode Island Act of 2014 and the Rhode Island GHG Emissions Reduction Plan of 2016.  |

|  |   |
|--|---|
|  | <p>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.</p> |
|--|---|

## 4.2 Commercial and Industrial Demonstrations

The Company has prioritized two new demonstrations in 2022, as well as the continuation of five demonstrations included in prior years.

### a. Strategic Energy Management (SEM)/Continuous Energy Improvement (CEI)

**Demonstration Stage:** Develop or Demonstrate

**Innovation Overview:** Strategic energy management (SEM), renamed Continuous Energy Improvement 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 wastewater 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. Six 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 2020, three of the seven customers participating in the Rhode Island cohort were able to claim gas and four of the seven customers claimed electric savings. The gas savings totaled over 165,000 net therms, however, approximately 74% of the

savings came from a single customer. The electric savings amounted to roughly 1,540,000 net kWh with approximately 72% of the total savings coming from one customer.

For 2021, two of the seven customers in the Rhode Island cohort claimed gas saving that amounted to over 133,500 net therms. The 2021 electric results are expected to be calculated in the fall of 2021.

In 2022, the Company and its implementation partner, Cascade Energy, will look to conclude the Continuous Energy Improvement/Strategic Energy Management demonstration. Learnings and findings from this demonstration will be incorporated into other program offerings such as ESPO and the Industrial Initiative.

**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

## **b. Network Lighting Controls Plus HVAC**

**Demonstration Stage:** Develop or 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, the commissioning of the system, and conveying the cumulative value of this approach with customers. 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 NLC+ 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.

Phase II of the research began in 2020 and includes customer installations and M&V efforts. Phase II will continue into 2022 due to the longer than anticipated time required to recruit customers for the demonstration and long lead times of the lighting projects. At the time of writing, one project is expected to move forward, and a few additional leads are being processed.

**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

### c. Smart Valves on Chilled Water Systems

**Demonstration Stage:** Develop or Demonstrate

**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. This measure is anticipated to be offered as a custom measure.

**Target Customer and Program Fit:** Customers with chilled water systems and air handlers.

**Prior Efforts:** This demonstration began in 2021 with a single customer installation and M&V beginning in the spring and into the summer.

**Demonstration Delivery:** In 2021 the Company began work to recruit three customers to participate in the demonstration project, including smart valve installation and M&V. One customer with two projects in separate buildings has already had the product installed. 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 chilled water plant optimization project, and potentially make recommendations on energy savings estimates.

**Evaluation:** Vendor evaluation

#### **d. Gas Heat Pumps**

**Demonstration Stage:** Develop or Demonstrate

**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. In 2021, the Company screened the technology against various baselines and for various sized commercial customers, comparing absorption- and compression-driven technologies. The Company will explore the performance of gas heat pumps at small commercial sites, compared to other gas and electric HVAC options.

**Demonstration Delivery:** The Company will install gas heat pumps at three to four customer sites.

**Evaluation:** Vendor Evaluation

#### **e. Air Curtains**

**Demonstration Stage:** Concept

**Innovation Overview:** Air Curtains are placed over doorways between two differently conditioned environments to limit heat transfer between the two spaces, thus reducing the heating/cooling load needed to maintain their separate environments. They are an effective alternative to plastic vinyl strip curtains and high speed roll up doors, particularly in areas of heavy human/vehicle traffic. Air curtains consist of a fan mounted over a doorway which when turned on, creates a seamless air barrier over the open doorway. This serves a dual purpose of preventing mixture of air between the separated spaces and entry of dust and other contaminants.

**Target Customer and Program Fit:** This technology will be a benefit to industrial customers with large overhead doors separating indoor and outdoor spaces where there is high foot or vehicular traffic, such as loading docks or warehouses. There is potential that this technology can also benefit smaller industrial and commercial customers with areas of high foot traffic, such as small retail businesses or restaurants. In addition, this technology has been utilized in refrigeration applications, and could be utilized in large industrial refrigerated warehouses and smaller coolers with high foot traffic.

**Prior Efforts:** No prior efforts, in Rhode Island, have been undertaken to include air curtains as a prescriptive measure. There is a limited history of air curtains being included in prior custom projects.

**Demonstration Delivery:** The Company would demonstrate the effectiveness of air curtains in a few different scenarios, as there are several applications of air curtains. Primarily, demonstrating capability in a large industrial setting separating a conditioned indoor space and an unconditioned outdoor space, a small commercial application separating a conditioned indoor space and an unconditioned outdoor space, and refrigerated spaces both large and small.

**Evaluation:** Vendor Evaluation

#### f. **Automated RTU Optimization**

**Demonstration Stage:** Concept

**Innovation Overview:** The Company is looking for new ways for customers to improve control of their HVAC systems to realize energy savings and improve comfort. One such approach is automated systems optimization, in which software analyzes and modifies the control of equipment automatically. This demonstration project will examine the SwarmStat™ product, which can be deployed for smaller customers with 2 or more RTUs controlled by smart thermostats and no existing EMS. This product is of particular interest since it allows simple, enhanced controls for small to medium customers with minimal upfront investment.

**Target Customer and Program Fit:** Customers with 4+ RTUs and no building automation or energy management system.

**Prior Efforts:** No prior efforts have been undertaken for this measure.

**Demonstration Delivery:** The Company will work with an independent evaluator to assess gas and electric savings realized by automated optimization software. The Company expects the demonstration to include a pre/post analysis of energy consumption for 10-15 customers. The demonstration will be used to develop deemed savings estimates.

**Evaluation:** Independent Evaluation

### **g. Refrigeration Leak Survey and Repair**

**Assessment Stage:** Develop or Demonstrate

**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 offering 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 customers. This product could be offered along with other common grocery store measures or through the custom retrofit pathway.

**Prior Efforts:** The Company included this product as an Assessment in the 2021 plan. The demonstration in 2022 will continue these efforts.

**Assessment Delivery:** The Company will complete a thorough refrigerant leak survey and repair for two customers in 2022. Energy savings will be verified through on-site metering and data collection and energy modeling.

**Evaluation:** Vendor Evaluation

## **4.3 Commercial and Industrial Assessments**

The Company has proposed two new C&I assessments for 2022.

### **a. Building Flexibility through Demand Response**

**Demonstration Stage:** Concept

**Innovation Overview:** Growing and optimizing Rhode Island's portfolio of demand response-ready assets is crucial for its climate goals, while creating a valuable revenue stream for building operators. A previous assessment identified opportunities to seed DR capability with HVAC systems through incentivizing communications and controls; this continued research expands on this work by investigating how DR capability can be seeded through broader approaches such as

monitoring-based/continuous/retro-commissioning, energy audits, or others to be identified. Furthermore, the assessment will investigate other existing programmatic routes by which load flexibility can be added to a building, such as through the course of EMS and BAS upgrades and monitoring-based or continuous commissioning projects.

**Target Customer and Program Fit:** Increasing building flexibility and expanding access to demand response revenue streams is broadly applicable across customers of various sizes and in various commercial and industrial sectors. The assessment will particularly seek to understand barriers to accessibility for customers currently not capable of participating in demand response offerings.

**Prior Efforts:** This work will expand on previous research in the 2021 assessment, “HVAC Automation for Demand Response”.

**Assessment Delivery:** The Company will investigate various existing program offerings which create building flexibility through pathways such as monitoring-based/continuous/retro-commissioning, energy audits, or others to be identified, through interviewing curtailment providers, program managers, contractors, and other relevant DR-enabling parties. The assessment will seek to quantify potential benefits and impacts of various flexibility-enabling pathways across customer segments.

**Evaluation:** Internal Review

## b. Software and Hardware Solutions for Rightsizing RTUs

**Demonstration Stage:** Concept

**Innovation Overview:** Along with installing more efficient HVAC equipment customers can avoid energy consumption over time by rightsizing their equipment at the time of design or specification. Equipment is often oversized to ensure occupant comfort, but the same levels of comfort can be provided with appropriately sized and controlled equipment.

This assessment will explore developing an approach for identifying rightsizing opportunities and estimating incremental savings through rightsizing equipment. Two potential opportunities are rightsizing when an older oversized system is replaced or switching from whole-building heating to spot heating. Further, the Company will explore how software can be used to encourage rightsizing, either by more effective control of smaller equipment or by establishing that existing equipment is oversized.

**Target Customer and Program Fit:** All commercial and industrial customers

**Prior Efforts:** There have been no prior efforts to systematically consider rightsizing in the C&I sector. The residential programs have offered downsizing HVAC system incentives for some time.

**Assessment Delivery:** The assessment will establish a protocol for when and how rightsizing should be considered. This will include discussions with market actors to understand how equipment is typically sized and barriers to more appropriate sizing for new installations and for time of replacement installations. The Company will include discussions with the EM&V team about savings and baseline documentation. The assessment will make recommendations on whether rightsizing should be considered within the prescriptive HVAC offerings or only on a custom basis.

**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 2022.

### 5.2 Residential Demonstrations

The Company is continuing three demonstrations for the Residential sector in 2022.

#### a. New Air Sealing and Insulation Products

**Demonstration Stage:** Develop or Demonstrate

**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. Aerobarrier 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:** The demonstration began in 2021. The Company screened the processes for residential customer cost and benefit and determined applicable customer characteristics. The Company also interviewed vendors to determine pricing and feasibility, scoping out project deliverables; the demonstration will be executed in 2022 following vendor proposals and finalization of work and evaluation schedule.

**Evaluation:** Vendor Evaluation

## **b. Gas Heat Pumps**

**Demonstration Stage:** Develop or Demonstrate

**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 in determining advantages or disadvantages to conventional electric heat pump technologies.

**Prior Efforts:** The Company has previously assessed the applicability of gas heat pumps to C&I customers. In 2021, The Company screened the possible measure for cost-effectiveness and evaluated the commercial availability of residential-scale gas heat pumps. The Company is

currently planning a 2022 timeframe for testing and evaluation of the heat pumps with a gas heat pump manufacturer.

**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.

### c. Solar Inverter Direct Load Control (ConnectedSolutions)

**Demonstration Stage:** Develop or Demonstrate

**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.

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 concluding an evaluation of the 2021 year activity.

### 5.3 Residential Assessments

The company proposes one new Residential Assessment for 2022.

#### a. Closing the Gas Gap for All Electric Homes

**Demonstration Stage:** Concept

**Innovation Overview:** While there are all electric options for many appliances and systems within a home, builders often still connect new construction homes to gas to serve gas cooking and fireplaces. To further advance the development of all electric homes in Rhode Island, the Company must address these end uses. The goal of this assessment will be to examine how the programs can promote new construction of all-electric buildings (without a gas connection) in part through incentivizing the electric alternative of these appliances. Possible outcomes include recommendations for standalone measures or for alternative incentive mechanisms to broadly incentivize all-electric homes.

**Target Customer and Program Fit:** This assessment will consider customers buying new homes and builders of new homes, across single-family and multi-family new construction.

**Assessment Delivery:** This assessment will examine high efficiency options for electric ovens, induction cook tops, and electric fireplaces as an alternative to less-efficient electric equipment or gas equipment. The assessment will also identify non-monetary barriers to all electric homes (such as customer preference) and ways the programs can help overcome those issues.

**Prior Efforts:** There are no prior efforts.

**Evaluation:** Internal review



# 2022 Cross-Program Summary

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## Introduction

The Cross-Program Summary documents how the proposed 2022 Energy Efficiency Annual 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. EnergyStar HVAC

a. Is the program being moved from, consolidated with, or split between another program proposal?

i. Yes. The centralized online marketplace provides guidance and advisory resources for hot water heating solutions. See Marketing, Outreach & Education section in Attachment 1. The marketplace creation was funded by OPEX in several jurisdictions. In 2022, 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?

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. EnergyWise

- 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. EnergyWise 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



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
  - ii.

VI. 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, 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 2022, the RI EE Annual Plan includes budget for the marketplace licensing fee, rebates as a service, 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 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 2022, 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 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. Explain why the spending for the categories listed above should be funded in multiple programs/dockets.
    - i. N/A

VIII. 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

IX. 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

X. 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 likely being discontinued in 2022. Please see Docket No. D-21-09, Attachment NG-DIV-1-29-2, Page 44 of 117. <sup>1</sup>
- b. Does the program have a component funded in other programs?
  - i. No. See above response.
- 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

---

<sup>1</sup> [http://www.ripuc.ri.gov/eventsactions/docket/D\\_21\\_09\\_DR\\_NGrid\\_1\\_Part\\_2.pdf](http://www.ripuc.ri.gov/eventsactions/docket/D_21_09_DR_NGrid_1_Part_2.pdf)

- 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

### XI. 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

### XII. 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?
  - i. 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

XIII. 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

XIV. 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 2022 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.

XV. Commercial & Industrial 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



## **Standardized Definitions for the 2022 Annual Energy Efficiency Plan**

### **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 annual plan energy efficiency savings goals.

### **Market Potential Study**

A Market Potential Study is a detailed assessment of the energy efficiency potential in a given market. In this Plan, the term is used in reference to the 2020 Rhode Island Energy Efficiency Market Potential Study.<sup>1</sup>

### **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.

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<sup>1</sup> Refer to the Market Potential Study: <http://rieermc.ri.gov/wp-content/uploads/2020/06/ri-study-final-report-volume-i-main-report-2020-06-10.pdf>



## **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. Per the Least Cost Procurement Standards, as updated in RI PUC Docket 5015, 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. Per the Least Cost Procurement Standards, as updated in RI PUC Docket 5015, a program is required to be cost-effective.

### **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**

Refer to the definition above. Included in this section again to indicate that assessments can be a component of programs.

### **Demonstration**

Refer to the definition above. Included in this section again to indicate that assessments can be a component of programs.

### **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 RI PUC in Docket 5023.<sup>2</sup>

### **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.

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<sup>2</sup> RI PUC Docket 5023: <http://www.ripuc.ri.gov/eventsactions/docket/5023page.html>

**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.





# 2021 Rhode Island Energy Efficiency Equity Working Group Report

Prepared by Green & Healthy Homes Initiative  
for inclusion in  
National Grid's 2022 Annual Plan

September 2021

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September 1, 2021

Chris Porter  
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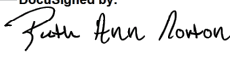
Re: 2021 Rhode Island Energy Efficiency Equity Working Group Report

Dear Chris Porter:

Please find attached to this letter, the Green & Healthy Homes Initiative's 2021 Rhode Island Energy Efficiency Equity Working Group Report (the "Report") prepared for National Grid for inclusion in its 2022 Annual Plan. We would like to thank National Grid and Rhode Island's Office of Energy Resources (OER) for co-hosting the Equity Working Group. In addition, we appreciate the opportunity provided by National Grid to allow GHHI to facilitate the EWG and thank the EWG members and partner organizations for their participation, engagement and feedback throughout the three-month process. I also want to thank Jamal Lewis (project lead) and Margarita Robledo-Guedes for their work in completing this process and the enclosed report.

In response to calls from the Rhode Island advocacy community and its own commitments to equitable delivery of programs, National Grid has embarked on a focused effort to update, develop, implement, and deliver their energy efficiency programs – including through the hosting of the EWG. We are confident that this Report can be a useful tool for National Grid, OER, the advocacy community, the PUC, and many others to continue to work towards an equitable clean energy future for all Rhode Islanders. Through our work in and commitment to the Rhode Island community, we would welcome the opportunity to continue to engage in this important work.

Sincerely,

DocuSigned by:  
  
1A42B3060D6A435...

Ruth Ann Norton  
President and CEO





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## Executive Summary

National Grid in Rhode Island, as a part of its 2021 Annual Energy Efficiency Program Plan (2021 Annual EE Plan) and 2021-2023 Energy Efficiency Program Plan (2021-2023 EE Plan), committed to working with the Rhode Island (RI) Office of Energy Resources (OER) to co-host an Energy Efficiency Equity Working Group (EWG). The objective of the EWG was to provide National Grid with recommendations on incorporating equity in the planning, design, and delivery of its future RI Energy Efficiency Programs. More information on National Grid's current programs can be found on [National Grid's website](#) or in National Grid's [Three-Year Plan and 2021 Annual Plan filing](#).

The EWG was comprised of twenty-six people representing diverse organizations and personal backgrounds. Green & Healthy Homes Initiative facilitated the EWG meetings. There were six meetings held over four months (May 2021-August 2021): an introductory meeting, four topic-specific meetings (marketing and outreach, metrics and data collection, workforce development and training, and program budgets), and a final wrap-up meeting. The goal of each topic-specific meeting was for EWG members to discuss and recommend strategies that could significantly impact the equitable delivery of the Energy Efficiency Programs. Each of the top fourteen recommendations that emerged from the topic-specific meetings were compiled into one list and EWG members then voted for the overall top five priority recommendations:

1. Hire multilingual staff and partner with trusted leaders who have the same ethnic background and that frequent popular community gathering places such as community centers and faith-based organizations. Potential partnerships can include 1) working with YMCA's, senior centers, schools and universities, or other community organizations to provide program information at an event they are hosting, 2) co-hosting events in partnership with community organizations, 3) sponsoring events or efforts that help to meet other community needs such as a food drive or trash pick-up, or 4) partnering with trade associations or career centers to host trainings and job fairs.
2. Benchmark Energy Efficiency Program participation data for race, geography, socioeconomic status, language, age of home, age of owner, age of renter, heating fuel type, type and age of heating /hot water/cooling systems.
3. Develop multilingual marketing and outreach materials. Use accessible language to target audiences in each publication.
4. Partner with other home visiting programs to expand the reach and impact of National Grid's energy efficiency programs. Home visitors as part of visiting programs are typically discussed in a healthcare context and can include nurse case managers, occupational and physical therapists, home-based healthcare nurses, travelling doctors or physicians, and case workers. Partnering with these individuals or entities can include 1) offering trainings so that home visitors can identify potential beneficiaries of energy efficiency programs and make referrals into National Grid's programs 2) incentivizing home visitors to educate their clients on energy efficiency and refer their clients into energy efficiency programs 3) co-hosting outreach and marketing events that cover health- and energy-related topics 4) targeting energy efficiency programs, energy bill



assistance, and heating or cooling assistance at high-risk households that often have medical conditions that cause them to have health-based home visitors.

5. Reduce barriers to professional development as well as entry into the workforce. This can include 1) helping to pay for, or support employees in paying for, necessary trainings for interested individuals 2) investing in building new, accessible training centers in underserved communities, particularly in cases where the closest training center is out of state 3) incentivizing certified trainers to host more frequent trainings in different parts of the state, particularly in underserved areas 4) helping to create on-the-job training programs to allow trainees to get necessary and valuable experience 5) providing upfront seed capital to foster the creation of more minority- or women-owned businesses by covering costs for tools, trucks, and supplies as well as operating investments for costs such as liability insurance 6) potentially paying off student loans of energy efficiency workers to reduce economic burden 7) sponsor other professional development and skills trainings to allow workers to build competencies in other areas that enable expansion of work into new fields.

The top fourteen recommendations that emerged from the marketing and outreach, metrics and data collection, and workforce development and training meetings are listed below and include the prioritized recommendations listed above. EWG group members voted from this list to get the top five prioritized recommendations (listed above) during the Program Budgets meeting.

- Develop multilingual marketing and outreach materials. Use accessible language to target audiences in each publication.
- Hire multilingual staff and partner with trusted leaders who have the same ethnic background and that frequent popular community gathering places such as community centers and faith-based organizations.
- Include in the messaging that National Grid is not code enforcement so residents can feel more comfortable.
- Develop age-appropriate marketing strategies to connect with various age groups that live in a household such as utilizing social media, apps, and text messaging to reach new audiences and help engage customers with their energy usage.
- Partner with other home visiting programs to expand the reach and impact of National Grid's energy efficiency programs.
- Allocate a proportion of Energy Efficiency marketing budgets to municipalities for mailing energy efficiency materials; some municipalities use third parties for mailing.
- Provide incentives to community groups that are serving vulnerable populations.
- Develop a mechanism that allows participation or action to occur immediately after the marketing step.
- Benchmark Energy Efficiency Program participation data for race, geography, socioeconomic status, language, age of home, age of owner, age of renter, heating fuel type, type, and age of heating /hot water/cooling systems.
- Track late payments and shut offs.
- Align energy efficiency programs with healthcare and partner to achieve healthcare goals, promote further engagement, and sharing health outcome and impact data.



- Perform a full review of all HR policies and remove outdated policies that restrict hiring such as background checks.
- Reduce barriers to professional development, as well as entry into the energy efficiency workforce.
- Collaborate with local diverse community organizations to train and certify potential workers (Progresso Latino, Hispanic chamber of commerce, cape Verdean community development).

The following list represents additional recommendations that were discussed during each topic-specific meeting but did not rise to the top during the voting for that meeting. These recommendations were harvested from the brainstorming platform, kept in their original form and language, and can be viewed as direct quotes.

- Marketing and Outreach
  - o Help customers use apps in their own language to manage/see their energy use – teach customers how to use these apps.
  - o Reach people in a way that’s exciting and will not feel triggering or disappointing – find ways to distinguish energy efficiency outreach from bills.
  - o Publicly benchmark and label energy usage.
  - o Utilize billboards that can be seen by many on the highway.
  - o Utilize lawn signs.
  - o Produce information in brail for vision impaired and ASL for hearing impaired.
  - o Utilize clear marketing that energy efficiency is a benefit and will be easy.
  - o Explore different ways that people get news and information and use those channels to try to reach and engage as many people as possible.
  - o Target outreach to individuals who need the assistance to reduce costs and improve quality.
  - o Create materials that appeal to a variety of skills and abilities; reach the customer where they are.
  - o Tailor the message to community/needs/concerns priorities.
- Metrics and Data Collection
  - o Track customer preferred language and contractor language capacity.
  - o Align workforce with the race, ethnicity, and language of the customer base.
  - o Incorporate six dimensions of equity metrics from the Urban Institute publication “[The State of Equity Measurement](#)”<sup>1</sup>.
  - o Advance enhanced data sharing with community action programs.
- Workforce Development and Training
  - o Work to ensure there are more local BPI testing centers and increased capacity for testing and training.

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<sup>1</sup> Martin C, Lewis J. *The State of Equity Measurement: A Review for Energy Efficiency Programs*. The Urban Institute; 2019. [https://www.urban.org/research/publication/state-equity-measurement/view/full\\_report](https://www.urban.org/research/publication/state-equity-measurement/view/full_report)



- Incentivize diversity in program workforce (Recognize that diversity in the workforce is valuable to the programs – National Grid should be willing to pay for this).
- Create internships for residents of Environmental Justice (EJ) communities to join the energy workforce.
- Make industry standards regarding pay/wages – National Grid could do a rate scale analysis to help support pay that attracts and retains diverse individuals.
- Provide financial support for retention (maybe a retainment bonus could be provided).
- Develop a Rhode Island energy job board that could include both policy and trades.
- Partner with grade schools in environmental justice communities to promote math and science at early ages.
- Coordinate the joint development of training with organizations and individuals that are conducting workforce development training in their respective communities.
- Reassess and make changes to streamline certification processes for BPI and other energy efficiency related certifications.
- Standardize programs and offerings so that they are easy to braid together.
- Offer more incentives for staff – rental assistance, work/life balance, bonuses, paid apprenticeships.
- Offer workshops for businesses in environmental justice communities to learn how to become an official National Grid vendor.

Using the EWG’s top fourteen recommendations, National Grid proposed specific actions to include in the 2022 Annual Plan that would enhance their energy efficiency programs. A table of the proposed actions can be found in National Grid’s 2022 Annual Plan. These proposed actions were presented to the EWG and discussed during the final meeting. Generally, EWG members were supportive of the proposed actions. There were some proposed actions, for which some EWG members had additional feedback. In addition, during the final meeting, EWG members debriefed the six EWG meetings and discussed the potential future of the EWG. All EWG members found the EWG meetings and process to be valuable and almost all EWG members thought that EWG meetings should continue beyond this initial phase with the purpose of tracking implementation of each proposed action and making further recommendations to National Grid. As one of the proposed actions, National Grid proposed to continue convening the EWG once a quarter.



## Background/Introduction

National Grid, as a part of its 2021 Annual Energy Efficiency Program Plan (2021 Annual EE Plan) and 2021-2023 Energy Efficiency Program Plan (2021-2023 EE Plan), committed to working with the Rhode Island Office of Energy Resources (OER) to co-host an Energy Efficiency Equity Working Group (EWG). The EWG was envisioned to 1) be comprised of representatives from state agencies, community-based organizations, advocacy organizations, and local subject matter experts in equity; 2) provide a space where the voices and concerns of impacted communities could inform discussions on equity issues; 3) identify areas of importance and focus around issues of equity for the energy efficiency programs; and 4) be a resource in the development of future Annual and Three-Year Energy Efficiency Plans, alongside related evaluation efforts. The desired deliverable from the EWG was to provide National Grid with written recommendations to advance equity in the planning, design, and delivery of its Energy Efficiency Programs. National Grid would then use these recommendations to propose the elimination of or alteration of current programs or development of new programs or services that would help to better serve National Grid's diverse customer base. More information on National Grid's current programs can be found on [National Grid's website](#) or in National Grid's [Three-Year Plan and 2021 Annual Plan filing](#).

In May 2021, National Grid contracted with the Green & Healthy Homes Initiative (GHHI) to facilitate the development and implementation of the EWG. GHHI is a national non-profit organization dedicated to addressing the social determinants of health and the advancement of racial and health equity through the creation of healthy, safe, and energy efficient homes. GHHI has a local Rhode Island office that works to coordinate federal, state, and philanthropic resources to develop programming, in partnership with state and local municipalities and nonprofits, that provides low-income Rhode Island residents with integrated energy efficiency, health, and safety housing retrofit programs. More information on GHHI can be found in the Appendix.

Given the desire to have the EWG recommendations inform and be included in National Grid's 2022 Annual Plan, GHHI committed to a quick timeline for recruiting EWG members, facilitating the EWG meetings, and finalizing recommendations by the end of August 2021. Within this timeline, GHHI proposed to host six EWG meetings between June 8<sup>th</sup> and August 26<sup>th</sup>.

## Methodology

### Equity working group member recruitment

During the month of May, GHHI recruited EWG members based on three factors: The original vision of the EWG outlined in the Annual and Three-Year Plans; internal GHHI connections and partnerships; and feedback and suggestions from National Grid, OER, and other key players in the Rhode Island energy efficiency field. Our intent was to achieve the following key objectives:

- 1) prioritize individuals and organizations that had experience and expertise in providing services – or designing and implementing policies that support services – that benefit residents of underserved and under-resourced communities, particularly limited income households, Black and Brown residents, and other communities served by National Grid's programs

- 2) add perspectives that have not traditionally been heard in energy efficiency proceedings or policy and program advocacy and



3) support diversity including, but not limited to, gender, race, economic status, and geography to ensure that EWG members represented a wide range of perspectives.

We recognize that our approach to EWG member recruitment was limited and may not have resulted in as diverse a group as possible. Nonetheless, we do believe that the EWG included individuals and organizations that provide services to underserved and under-resourced communities, represented voices that have not been traditionally engaged in energy efficiency planning, and was comprised of a diverse group of perspectives. The list of EWG members is included below.

- Amy Vavak, National Grid (co-host)
- Becca Trietch, Rhode Island Office of Energy Resources (co-host)
- Margarita Robledo-Guedes, GHHI Rhode Island
- Jamal Lewis, GHHI Rhode Island (facilitator)
- Brenda Clement, HousingWorks RI at RWU
- Rachal Calabro, Rhode Island Department of Health
- Jeanne Cola, LISC Rhode Island Health Equity Zone (Pawtucket/Central Falls)
- Jennifer Wood, Center for Justice
- Kathy McCabe, McCabe Enterprises
- Tony Hubbard, Youth Build Preparatory Academy
- Laura Rodormer, National Grid (co-host)
- Joel Munoz, Rhode Island Division of Public Utilities
- Stacy Wasserman, Rhode Island Housing
- Garry Bliss, Prospect CharterCare
- John Marcantonio, Rhode Island Builders Association
- Rilwan Feyisitan Jr., Community Action Partnership of Providence
- Rob Hart, City of Providence
- Elizabeth Moreira, City of Pawtucket
- Emily Freedman, City of Providence

In addition, there were several organizations and individuals that did not participate in the EWG meetings but that still wanted the opportunity to provide feedback on National Grid programs. GHHI had one-on-one meetings with these organizations and individuals, who offered additional recommendations based on their experiences. More information on these meetings can be found in the Appendix.

#### [Equity working group meeting timeline and topics](#)

GHHI facilitated six EWG meetings. The first meeting was an introductory meeting with the intention of creating space for EWG members to get to know each other and to level-set with a basic presentation of National Grid's Energy Efficiency Programs and the regulatory environment in which National Grid's Energy Efficiency Programs operate. The second, third, fourth, and fifth meetings were focused on distinct areas within the Energy Efficiency Programs: marketing and outreach; metrics and data collection; workforce development and training; and program budgets, respectively. The goal of meetings 2-5 was to ultimately present recommendations to inform the long-term direction of National Grid's Energy Efficiency Programs and include short term actions that National Grid could include in its 2022 Annual Plan. The last meeting served as a chance to finalize and prioritize the recommendations from each of the previous meetings. Each meeting was facilitated using the same guidelines and expectations, which can be found listed in the Appendix. The comprehensive meeting schedule is described below.



| Timeline and Meeting Topics  |  |  |  |
|--|--|--|--|
| May  | June   | July   | August   |
| <ul style="list-style-type: none"> <li>Equity working group recruitment</li> </ul> | <ul style="list-style-type: none"> <li>Equity working group recruitment</li> <li>Introductory meeting</li> <li>Second meeting: marketing and outreach</li> </ul> | <ul style="list-style-type: none"> <li>Equity working group recruitment</li> <li>Third meeting: metrics and data collection</li> <li>Fourth meeting: workforce development and training</li> </ul> | <ul style="list-style-type: none"> <li>Fifth meeting: program budgets</li> <li>Sixth meeting: finalize and prioritize recommendations</li> </ul> |

### Methodology for determining top recommendations

As mentioned above, the objective of the EWG was to offer National Grid recommendations to advance equity in the planning, design, and delivery of its Energy Efficiency Programs. For meetings 2-5, which featured voting, EWG members discussed and presented recommendations and then individually voted (via MURAL and PollEverywhere) on the recommendations they determined would have the most significant impact on equity pertaining to the RI Energy Efficiency Programs. The top recommendations were determined by the highest number of votes. Specifically, if the highest number of votes were four, six, and seven votes (i.e., all other recommendations received less than four votes), then all of the recommendations that received four, six, or seven votes would be included as a top recommendation. Continuing this example, if two recommendations received seven votes, five recommendations received six votes, no recommendation received five votes, and three recommendations received four votes, then all ten recommendations would be included in the top recommendations. In each of the sections below, the recommendations are split into top recommendations and other recommendations. The other recommendations represent ideas that surfaced during the brainstorming but did not receive enough votes to be considered a top recommendation.

### Additional considerations

There are several additional considerations that might be helpful to consider when attempting to understand this report or the efforts of the EWG.

1. Many energy efficiency program administrators, regulators, and staff across the country are attempting to improve the advancement of equity in the respective programs and, as of the writing of this report, there is no widespread consensus on the best way to define and/or promote equity in energy efficiency programs. There are several national initiatives<sup>2</sup> that were

<sup>2</sup> The American Council for an Energy Efficiency Economy (ACEEE) launched the [Leading with Equity Initiative](#) in January 2021, designed to convene community-based organizations, advocates, and utilities to jointly define success for equitable decarbonization, and then work to embed metrics that match this definition in ACEEE’s



created prior to the start of this EWG that are working to build a baseline understanding of this topic and develop standardized metrics to track and measure equity in energy efficiency programs.

2. Equity is a complex and dynamic term that can vary in meaning depending on the context. [A 2019 report published by the Urban Institute](#)<sup>3</sup> attempts to articulate these nuances. The report outlines four underlying concepts that may be important when defining equity.
  - a. Equity is historical parity, not just current equality, which means that equity should be viewed as an ongoing process and not a single goal with an endpoint.
  - b. Equity is measured for specific populations – including protected classes or groups with shared characteristics – for whom there is a relevant and reasonable past or current disparity in treatment. This means that equity could, and probably does, have different meanings depending on the perspective.
  - c. Equity is multifaceted and cannot be reduced to a single construct, which means that there is no single metric that can fully capture the nuances of equity.
  - d. Equity can and should be measured for each component along an intervention: development, implementation, quality, and outcome.
3. The implementation of the EWG in the summer of 2021 occurred on the heels of a nationwide, and arguably global, awakening that resulted in a majority of Americans understanding that racism and racial inequities exist in many facets of American society.<sup>4</sup> After the murder of George Floyd on May 25<sup>th</sup>, 2020, many Americans demanded action to promote equity and justice and many companies and organizations responded with statements and commitments to combat racism and racial injustice with their platforms.<sup>5,6,7,8</sup> And, President Biden made racial justice a pillar of his presidency with the announcement of Executive Order 13985, which directed federal agencies to, among other things, identify methods of assessing equity, conduct

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utility, state, and city scorecards. In May 2021, the Urban Energy Justice Lab at the University of Michigan School for Environmental and Sustainability launched the [Energy Equity Project](#) with the goal of creating a framework for measuring equity across energy efficiency and clean energy programs among utilities, state regulatory agencies, and other practitioners, while engaging and centering BIPOC and frontline communities.

<sup>3</sup> Martin C, Lewis J. *The State of Equity Measurement: A Review for Energy Efficiency Programs*. The Urban Institute; 2019. [https://www.urban.org/research/publication/state-equity-measurement/view/full\\_report](https://www.urban.org/research/publication/state-equity-measurement/view/full_report)

<sup>4</sup> Mallory Newall, Sara Machi. White and Black Americans far apart on racial issues. *Ipsos*. <https://www.ipsos.com/en-us/news-polls/npr-racial-inequality-issues>.

<sup>5</sup> Alex Altman. Why The Killing of George Floyd Sparked an American Uprising. *TIME*. Published online June 4, 2020. <https://time.com/5847967/george-floyd-protests-trump/>

<sup>6</sup> Chauncey Alcorn. George Floyd's death was a wake-up call for Corporate America. Here's what has — and hasn't — changed. *CNN Business*. <https://www.cnn.com/2021/05/25/business/corporate-america-anti-racism-spending/index.html>. Published May 25, 2021.

<sup>7</sup> Levi Sumagaysay. Companies that declared solidarity after George Floyd killing may be 'woke washing,' shareholder advocates warn. *MarketWatch*. <https://www.marketwatch.com/story/companies-that-declared-solidarity-after-george-floyd-killing-may-be-woke-washing-shareholder-advocates-warn-11621960301>. Published May 29, 2021.

<sup>8</sup> Emma Whitford. Going Behind the Rhetoric. *Inside Higher Ed*. August 5, 2021. <https://www.insidehighered.com/news/2021/08/05/naspa-report-examines-statements-wake-george-floyds-murder>





an equity assessment in federal agencies, allocate federal resources to advance fairness and opportunity, and engage with members of underserved communities.<sup>9,10</sup> This is all to say that there are many people across the country attempting to take actions to advance and promote equity, National Grid included.

4. The EWG is intentionally made up of members with varying understanding of – and expertise in – equity, National Grid’s Energy Efficiency Programs, and general energy efficiency. Therefore, it is possible that EWG members have made recommendations that National Grid has already implemented. This scenario should not be viewed as an attack on National Grid or any of its implementation partners nor should it be viewed as a confirmation that National Grid’s programs are currently equitable. All recommendations should be viewed as ways that the EWG members believe National Grid can act to improve the advancement of equity within its programs – whether these recommendations are already being implemented or not.
5. Separate from the EWG process, National Grid hired the Cadeo Group to conduct two market studies: a Participation and Multifamily Census Study and a Nonparticipant Market Barriers Study. The Participant and Multifamily Census Study was designed to assess, document, and analyze historical participation – and, relatedly, nonparticipation – in National Grid Rhode Island’s residential energy efficiency programs between 2016 and 2020 and to create a comprehensive database (or as close to comprehensive as possible) of the multifamily (MF) buildings in Rhode Island that includes building characteristics and an indicator of whether each building has participated in a National Grid efficiency program. This Participant study relies on existing National Grid data to develop profiles for participants of National Grid programs. The Nonparticipant Market Barriers Study is designed to provide in-depth research to characterize customers that have not participated in National Grid Rhode Island’s residential programs, assess barriers to their participation, and identify opportunities to engage them. This Nonparticipant study utilizes surveys to understand why certain customers do not participate in National Grid’s programming. On June 23<sup>rd</sup>, the EWG provided feedback on Nonparticipant Market Barriers Study Work Plan. Both National Grid market studies and the EWG process are complementary to National Grid’s goals of serving its diverse customer base in the most equitable way.

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<sup>9</sup> Executive Office of the President. *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.*; 2021. <https://www.federalregister.gov/documents/2021/01/25/2021-01753/advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government>

<sup>10</sup> The White House Briefing Room. Executive Order On Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. Published January 20, 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>



## Meeting Discussions and Recommendations

### Introductory Meeting

On June 8<sup>th</sup>, 2021, the EWG had its first meeting. The intended goals of this meeting were to 1) provide space for EWG members to get to know each other, 2) level-set the group’s understanding of National Grid’s Energy Efficiency Programs and the regulatory environment in which these programs exist, 3) build a shared understanding of how the group wanted to define equity in the context of energy efficiency, and 4) ensure that participants understood that the EWG was designed to provide National Grid with recommendations on equity for the planning, design and delivery of its Energy Efficiency Programs.

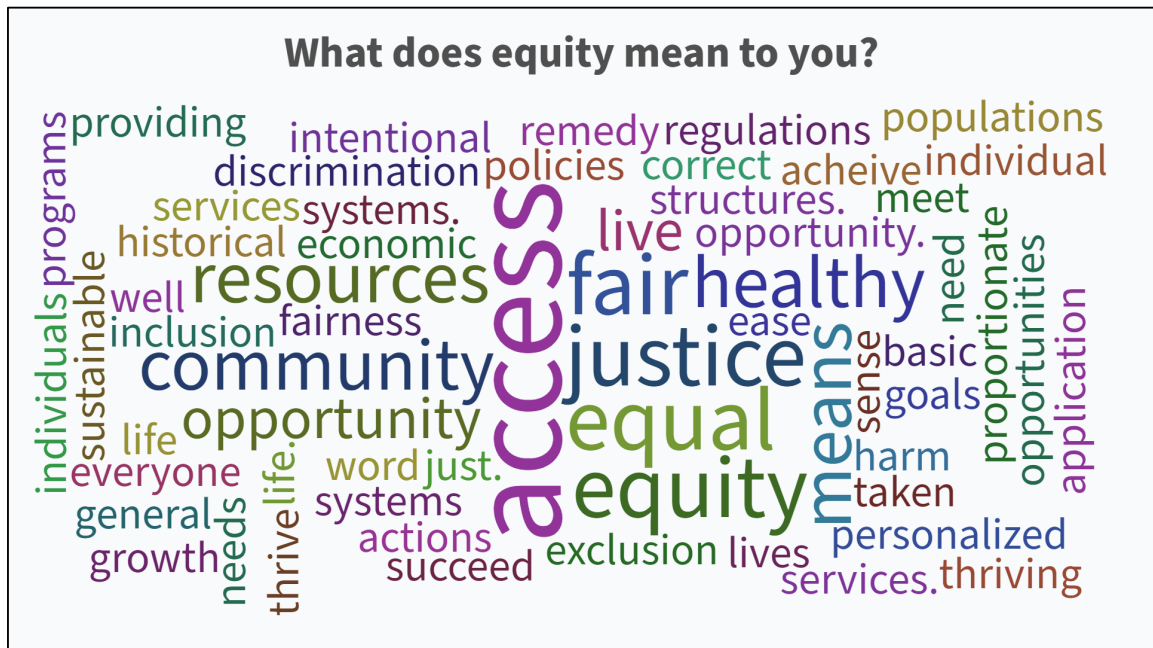
The meeting began with a large group ideation session to define equity in the context of this project. Through an interactive exercise where EWG members submitted their individual definition and/or perception of equity, the following word-cloud image was created. To add additional context into the defining equity exercise, here are some quotes from the meeting that are examples of how the EWG members describe equity.

“Intentional actions taken to remedy and correct historical exclusion, discrimination, and harm in policies, systems and structures.”

“For me, it was three words. Fair, impartial, and opportunity.”

“Justice and community.”

**Initial EWG Exercise** – Individual definitions and/or perceptions of equity.





The next part of the meeting featured a presentation by National Grid introducing the RI Energy Efficiency Programs and the regulatory context in which those programs operate. Topics of the presentation included 1) the program planning process, 2) the list of, and budget for, the energy efficiency programs that National Grid administers including the breakdown of in-home programs, retail programs, and customer behavior and education programs, 3) the benefits and larger impact of these programs such as energy savings, gross domestic produce (GDP) impact, greenhouse gas emissions reduction, and the jobs impact, and 4) relevant third-party evaluation, measurement, and verification (EMV) studies including the Participant and Multifamily Census study and the Non-Participant Market Barrier study, which are occurring simultaneously to this EWG process.

### Marketing and Outreach Meeting

On June 23<sup>rd</sup>, 2021, the EWG met to discuss equitable marketing and outreach. The goal of this meeting was to create a prioritized list of action-oriented recommendations that can improve the way that National Grid markets and performs outreach for their energy efficiency programs.

The first part of the discussion centered around defining equitable marketing and outreach. By and large, participants broadly described equitable marketing and outreach as the ability to provide access to the people who need it most, who would have never otherwise thought about energy efficiency, and who need to be proactively encouraged to participate in the programs. Some participants indicated the importance of targeted messaging utilizing specialized and accessible mediums that meet people where they are and appeal to community needs, concerns, and priorities. Every community should be able to receive and understand marketing material that highlights and provides information on National Grid's programs. Equitable marketing and outreach initiatives go the extra mile to explore and implement outreach strategies that ensure every community is able to receive and understand program information.

### Top recommendations

- Develop multilingual marketing and outreach materials. Use accessible language to target audiences in each publication.
- Hire multilingual staff and partner with trusted leaders who have the same ethnic background and that frequent popular community gathering places such as community centers, faith-based organizations, etc.
- Include in the messaging that National Grid is not code enforcement so residents can feel more comfortable.
- Develop age-appropriate marketing strategies to connect with various age groups that live in a household such as utilizing social media, apps, and text messaging to reach new audiences and help engage customers with their energy usage.
- Partner with other home visiting programs to expand the reach and impact of National Grid's energy efficiency programs.



- Allocate a portion of Energy Efficiency marketing budgets to municipalities for mailing energy efficiency materials; some municipalities use third parties for mailing.
- Provide incentives to community groups that are serving vulnerable populations.
- Develop a mechanism that allows participation or action to occur immediately after the marketing step.

#### Additional recommendations

- Help customers use apps in their own language to manage and see their energy use – teach customers how to use these apps.
- Reach people in a way that’s exciting and will not feel triggering or disappointing – find ways to distinguish energy efficiency outreach from bills.
- Publicly benchmark and label energy usage.
- Utilize billboards that can be seen by many on the highway.
- Utilize lawn signs.
- Produce information in brail for vision impaired and ASL for hearing impaired.
- Utilize clear marketing that energy efficiency is a benefit and will be easy.
- Explore different ways that people get news and information and use those channels to try to reach and engage as many people as possible.
- Target outreach to individuals who need the assistance to reduce costs and improve quality.
- Create materials that appeal to a variety of skills and abilities; reach the customer where they are.
- Tailor the message to community, needs, concerns, and priorities.

#### Metrics and Data Collection

On July 14<sup>th</sup>, 2021, the EWG met to discuss measuring and analyzing program data determined to represent equity indicators. The goal of this meeting was to create a prioritized list of metrics and data that National Grid should consider in assessing how equitably their energy efficiency programs are delivered.

In recent years, there has been a shift to better understand how energy efficiency programs can be more equitable. Despite the existence of programs that serve low- and moderate-income households, there is an increasing realization that the benefits of energy efficiency may not reaching those who can most benefit from the services. Several efforts<sup>11</sup> including the [Energy Equity Project](#), housed at the Urban Energy Justice Lab at the University of Michigan’s School for Environment & Sustainability, and the American Council for an Energy-Efficient Economy’s (ACEEE) [Leading with Equity Initiative](#) have

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<sup>11</sup> The American Council for an Energy Efficiency Economy (ACEEE) launched the [Leading with Equity Initiative](#) in January 2021, designed to convene community-based organizations, advocates, and utilities to jointly define success for equitable decarbonization, and then work to embed metrics that match this definition in ACEEE’s utility, state, and city scorecards. In May 2021, the Urban Energy Justice Lab at the University of Michigan School for Environmental and Sustainability launched the [Energy Equity Project](#) with the goal of creating a framework for measuring equity across energy efficiency and clean energy programs among utilities, state regulatory agencies, and other practitioners, while engaging and centering BIPOC and frontline communities.



begun a process of developing and incorporating new metrics that will enable energy efficiency programs to better measure equity. To ground the discussion in some of this broader context, participants were sent an [article<sup>12</sup>](#) that discussed the importance of data in promoting energy equity.

We began the conversation with a broad prompt: How do you/would you measure equity in your own programs? Some participants offered some perspective from their own work, including the desire to track and measure the equity impact of their programs and the recognition that collecting and analyzing data is an important part of determining a baseline and improving program services in a way that continuously gets better at advancing equity. One commenter stated that while collecting perfect data is the goal, we ought to not spend our entire life waiting for perfect data before we act; there are things we can do now, and we should do them simultaneously. Other participants mentioned the importance of collecting demographic information and analyzing program outcomes by these demographics including race.

Next, the conversation shifted to be more focused on measuring equity in energy efficiency programs. Given the wide range of experience with energy efficiency, GHHI and National Grid presented some slides with the goal of getting each participant to a similar baseline of knowledge and understanding. GHHI presented a slide on its 2019 report, co-published with the Urban Institute, called [The State of Equity Measurement: A Review for Energy-Efficiency Programs<sup>13</sup>](#), which offers a framework for how to think about measuring equity within energy efficiency programs. This report has been cited as a useful resource on the topic of energy equity and measurement. National Grid then presented a few slides on its current metrics and data collection practices so participants could understand what National Grid currently measures. After these presentations, participants moved into breakout groups to discuss questions related to metrics and data that National Grid should consider adopting to measure equity more effectively.

In these breakout groups, participants offered perspectives on how they would measure whether equity is being achieved through energy efficiency programs. There were largely two components of programs that participants described as being important: Equity in program delivery and equity in program impact. To assess equity in program delivery, participants mentioned tracking detailed demographics such as race, language, geography, and family size as well as information on vulnerable individuals and communities such as older adults, people with special healthcare needs, and historically excluded, underserved, or under-resourced communities. Evaluating equity in program impact means tracking and collecting data on household energy burden as well as other non-energy impacts. Given that energy efficiency can improve environmental quality and household occupant health outcomes, participants noted that tracking health impacts can be a way to understand how these benefits are being distributed. A few participants noted the importance of building trust in communities so that program participants could feel comfortable sharing data. Communicating the goal of data collection and partnering with community leaders and faith-based organizations represent some examples of ways to build trust. Ultimately, EWG participants noted the importance of meeting households and businesses where they

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<sup>12</sup> Robert Walton. Energy equity depends on data, and experts say there isn't enough of it. *Utility Dive*. July 8, 2021. [Energy equity depends on data, and experts say there isn't enough of it | Utility Dive](#)

<sup>13</sup> Martin C, Lewis J. *The State of Equity Measurement: A Review for Energy Efficiency Programs*. The Urban Institute; 2019. [https://www.urban.org/research/publication/state-equity-measurement/view/full\\_report](https://www.urban.org/research/publication/state-equity-measurement/view/full_report)



are with program resources to create pathways for everyone to participate. These conversations led to the recommendations listed below.

#### Top recommendations

- Benchmark Energy Efficiency Program participation data for race, geography, socioeconomic status, language, age of home, age of owner, age of renter, heating fuel type, type and age of heating /hot water/cooling systems.
- Track late payments and shut offs.
- Align energy efficiency programs with healthcare and partner to achieve healthcare goals, promote further engagement, and sharing health outcome and impact data.

#### Additional recommendations

- Track customer preferred language and contractor language capacity.
- Align workforce with the race, ethnicity, and language of the customer base.
- Incorporate six dimensions of equity metrics from the Urban Institute publication "[The State of Equity Measurement](#)"<sup>14</sup>.
- Advance enhanced data sharing with community action programs.

### Workforce Development and Training

On July 27<sup>th</sup>, 2021, the EWG met to discuss equitable workforce development and training. The goal of this meeting was to identify gaps and barriers that exist, and which prevent the development of a diverse workforce prepared to serve an equally diverse customer base, and to develop solutions to overcome these challenges.

The meeting began with a poll to understand the types of perceived jobs that exist in the energy efficiency workforce and to explore what an equitable and diverse workforce looks like. Below are two word clouds that illustrate participants' answers.

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<sup>14</sup> Martin C, Lewis J. *The State of Equity Measurement: A Review for Energy Efficiency Programs*. The Urban Institute; 2019. [https://www.urban.org/research/publication/state-equity-measurement/view/full\\_report](https://www.urban.org/research/publication/state-equity-measurement/view/full_report)





participants continued to discuss challenges and barriers to achieving a more diverse energy efficiency workforce and brainstormed actionable recommendations that National Grid can advance within the scope of its work.

The panel discussion and the breakout groups covered a variety of topics and highlighted several important points. It was brought up that by and large there is a shortage of workers that are trained and certified to perform energy efficiency services. It should also be noted that given the nature of the panelists and the EWG members that are close to workforce, most of the discussion centered around the workforce required to perform in-home weatherization and energy efficiency services. Given the overall shortage of workers, there is a culture of competition among different community action program (CAP) agencies and energy auditor and contractor firms that leads some to offer more competitive wages and other benefits to attract qualified applicants. While competitive wages and attractive benefits are ultimately good for applicants, firms continue to have a hard time retaining their employees. In addition, the shortage of workers is exacerbated by 1) the lack of people interested in learning trades, 2) barriers within National Grid's internal hiring and contractor on-boarding process, and 3) the amount of time and resources needed to train and certify interested applicants. Some participants noted that the requirement for applicants to have a background check has prevented some interested applicants from being able to be hired to work on National Grid contracts. Other participants noted that once they get an applicant that is interested and passes National Grid's background check, among other things, there is a need to make sure that these individuals are trained and certified to work on federal contracts, which all of the CAP agencies also administer. The training centers that provide the necessary certifications are also not easily accessible, with many existing out of the state, taking up to a full week to complete, and offering classes infrequently (only offered twice a year) with a limited number of available spots. So, for example, a new energy auditor hire may have to wait up to six months to be trained and certified before they are able to perform an audit on their own.

One participant also noted the presence of tension between contractor firms and CAP agencies with funders like National Grid. For example, CAP agencies and their subcontracted contractors, who enter client homes, often administer or provide services for multiple programs in addition to energy efficiency. So, when they enter homes for an energy audit, auditors are often looking for other issues like food insecurity, which can be helped by referring the family into other programs also administered by the CAP agency. This is sometimes in contradiction with energy efficiency funders like National Grid, who value and push for maximized unit production. Another example that illustrates competing priorities is one that was exacerbated by COVID-19. In-home energy efficiency services, which require workers to enter the home of a client to perform an audit or install new equipment, directly threatened the health and safety of energy efficiency workers. Some CAP agencies paused their services to protect their staff, which could be seen as contradictory to the goal of maximized unit production in energy efficiency programs.

Other barriers to developing and maintaining a diverse energy efficiency workforce include economic barriers such as low wages, high upfront costs, and access to credit to cover training costs, equipment purchases, and startup costs for firms; delays in payment from program administrators like National Grid and the State government; lack of awareness and availability of job and professional development opportunities; and other barriers such as childcare and transportation.





Based on these barriers, EWG participants, as well as the panelists that joined for this meeting, brainstormed the following recommendations for ways that National Grid can take action to help develop and maintain a diverse energy efficiency workforce.

#### Top Recommendations

- Perform a full review of all HR policies and remove outdated policies that restrict hiring such as background checks
- Reduce barriers to professional development, as well as entry into the energy efficiency workforce.
- Collaborate with local diverse community organizations to train and certify potential workers (Progresso Latino, Hispanic Chamber of Commerce, Cape Verdean Community Development of RI)

#### Additional recommendations

- Work to ensure there are more local BPI testing centers and increased capacity for testing and training
- Incentivize diversity in program workforce (Recognize that diversity in the workforce is valuable to the programs – National Grid should be willing to pay for this)
- Create internships for residents of Environmental Justice (EJ) communities to join the energy workforce
- Make industry standards regarding pay/wages (i.e., National Grid could conduct a rate scale analysis to help support pay that attracts and retains diverse individuals)
- Provide financial support for retention (i.e., a potential retainment bonus)
- Develop a Rhode Island energy job board that could include both policy and trades
- Partner with grade schools in environmental justice communities to promote math and science at early ages
- Coordinate the joint development of training with organizations and individuals that are conducting workforce development training in their respective communities
- Reassess and make changes to streamline certification processes for BPI and other energy efficiency related certifications
- Standardize programs and offerings so that they are easy to braid together
- Offer additional incentives for staff (i.e., rental assistance, work/life balance, bonuses, paid apprenticeships)
- Offer workshops for businesses in environmental justice communities to learn how to become an official National Grid vendor

#### Program Budgets

On August 10<sup>th</sup>, the EWG met to discuss program budgets. The goal of this meeting was to prioritize recommendations that the EWG group believes would make the most significant impact on equity and should receive a budget allocation. Prior to the meeting, the facilitator compiled the top recommendations from the second, third, and fourth meetings into one list. EWG members then voted



on which of these top recommendations would ultimately make the most significant impact on equity and that National Grid should prioritize for budget allocation.

This meeting began with a breakout group discussion to identify ways that EWG members would evaluate a budget for equitable allocation. Several ideas were mentioned including evaluating the budget to ensure that the greatest investments are focused on closing the largest gaps (such as gaps in minority contractors, insufficient awareness of opportunities, pre-existing and disqualifying housing conditions). Budget should also reduce disparities in participation and service delivery, and target underserved subsets of the population including environmental justice communities, minority- and women-owned contracting firms and small businesses, apartment buildings, and non-English speaking households. Goal setting also emerged as an important part of equitable budget evaluation. Setting goals on how much money and resources should go to specific subsets of the population and specific geographies and then evaluating the budget based on these benchmarks. Participants mentioned that benchmarked goals should be set both periodically and continuously such that there are long-term (3-5 years), annual, and quarterly goals for distributing funding and resources equitably. In addition, there were several ideas that were specific to National Grid's budget. For example, some EWG members mentioned that if they were evaluating National Grid's budget, they would be looking for a diversified portfolio that is inclusive of benefits to all ratepayers including low-income and commercial and industrial payers. More specifically, they would be looking at what each class of customers are paying, where program dollars are going, and who's receiving the benefits of the programs to determine how equitable the budget is.

In the next part of the meeting, each participant voted on the top three recommendations that they felt would make the most significant impact on equity and that should be prioritized for a budget allocation by National Grid. Participants voted on a list of recommendations that were compiled from the second, third, and fourth EWG meetings on marketing and outreach, metrics and data collection, and workforce development and training, respectively. In total, there were fourteen recommendations from the previous EWG meetings that were classified as a top recommendation. The top five priority recommendations that received the highest number of votes during this meeting are listed below in order of highest number of votes to lowest.

#### Top five priority recommendations

1. Hire multilingual staff and partner with trusted leaders who have the same ethnic background and that frequent popular community gathering places such as community centers, faith-based organizations, etc. Potential partnerships can include 1) working with YMCA's, senior centers, schools and universities, or other community organizations to provide program information at an event they are hosting, 2) co-hosting events in partnership with community organizations, 3) sponsoring events or efforts that help to meet other community needs such as a food drive or trash pick-up, or 4) partnering with trade associations or career centers to host trainings and job fairs.
2. Benchmark Energy Efficiency Program participation data for race, geography, socioeconomic status, language, age of home, age of owner, age of renter, heating fuel type, type and age of heating /hot water/cooling systems.



3. Develop multilingual marketing and outreach materials. Use accessible language to target audiences in each publication.
4. Partner with other home visiting programs to expand the reach and impact of National Grid's energy efficiency programs. Home visitors as part of visiting programs are typically discussed in a healthcare context and can include nurse case managers, occupational and physical therapists, home-based healthcare nurses, travelling doctors or physicians, and case workers. Partnering with these individuals or entities can include 1) offering trainings so that home visitors can identify potential beneficiaries of energy efficiency programs and make referrals into National Grid's programs, 2) incentivizing home visitors to educate their clients on energy efficiency and refer their clients into energy efficiency programs, 3) co-hosting outreach and marketing events that cover health- and energy-related topics, or 4) targeting energy efficiency programs, energy bill assistance, and heating or cooling assistance at high-risk households that often have medical conditions that cause them to have health-based home visitors.
5. Reduce barriers to professional development as well as entry into the workforce. This can include 1) helping to pay for, or support employees in paying for, necessary trainings for interested individuals, 2) investing in building new, accessible training centers in underserved communities, particularly in cases where the closest training center is out of state, 3) incentivizing certified trainers to host more frequent trainings in different parts of the state, particularly in underserved areas, 4) helping to create on-the-job training programs to allow trainees to get necessary and valuable experience, 5) providing upfront seed capital to foster the creation of more minority- or women-owned businesses by covering costs for tools, trucks, and supplies as well as operating investments for costs such as liability insurance, 6) potentially paying off student loans of energy efficiency workers to reduce economic burden, or 7) sponsor other professional development and skills trainings to allow workers to build competencies in other areas that enable expansion of work into new fields.

#### Additional Top Recommendations (excluding the top five priority recommendations)

- Include in the messaging that National Grid is not code enforcement so residents can feel more comfortable.
- Develop age-appropriate marketing strategies to connect with various age groups that live in a household such as utilizing social media, apps, and text messaging to reach new audiences and help engage customers with their energy usage.
- Allocate a proportion of Energy Efficiency marketing budgets to municipalities for mailing energy efficiency materials; some municipalities use third parties for mailing.
- Provide incentives to community groups that are serving vulnerable populations.
- Develop a mechanism that allows participation or action to occur immediately after the marketing step.
- Track late payments and shut offs.
- Align energy efficiency programs with healthcare and partner to achieve healthcare goals, promote further engagement, and sharing health outcome and impact data.



- Perform a full review of all HR policies and remove outdated policies that restrict hiring such as background checks.
- Collaborate with local diverse community organizations to train and certify potential workers (Progreso Latino, Hispanic chamber of commerce, cape Verdean community development).

After voting, there was some discussion about why these top five priority recommendations rose to the top. The discussion also highlighted other recommendations that didn't rise to the top but that members of the group still view as important. It became clear during the discussion that participants believe that all fourteen possible recommendations are important and should be components of National Grid's equity strategy. Trust was another principle that guided some participants' votes. Several participants discussed the importance of having trusted messengers that look like the community, which can help the community see that the program is intended for them, and that can communicate effectively with potential clients in their first language. Recommendations 1 and 4 – hiring multilingual staff and partnering with trusted community leaders including faith-based leaders, representatives from community centers, and healthcare professionals – represent actions that National Grid can take to build and foster trust in their programs. According to EWG participants, other home visitors as a part of home visiting programs can be viewed as trusted leaders since they are often tasked with providing healthcare related services.

Since the first EWG meeting, access emerged as a key part of the definition of equity and some participants mentioned that it's hard to imagine equitable access to programming if program materials or staff are not sensitive to non-English speaking or other multi-cultural communities. Another key part of accessibility is the ability to speak to priorities that potential program participants care about. One meeting participant mentioned that from their experience households, particularly underserved and under-resourced households, often care more about keeping the lights on and other basic human needs than cost effectiveness of installation measures which is what National Grid – and many of their contractors by proxy – are required to care about. This can create a barrier in participation if National Grid staff and contractors are focused on measures that provide significant energy savings but may not align with the needs of that household. Recommendations 1 and 3 represent actions that National Grid can take to increase access to its programs among underserved and under-resourced communities.

Intentionality also emerged as a principle that guided meeting participants' votes. Given that certain demographics have lower participation rates in National Grid's programs, are disproportionately impacted by energy issues, and are less likely to get a job working in the energy efficiency industry – one participant noted that much of this is by intentional design given how energy and other social and economic policies are developed and implemented – it's important that intentional action is taken to overcome these barriers and change these realities. All five of the top recommendations represent actions that National Grid can take to be intentional about advancing equity in specific and targeted ways that are also responsive to the needs of underserved, under-represented, under-resourced, and historically excluded households and communities.



## Conclusion and Future Directions

On August 24, 2021, the EWG met to discuss National Grid's proposed actions for 2022 programming and the future of the EWG. The goal of the meeting was to hear National Grid's proposed actions for 2022 programming that were driven by the EWG's top fourteen recommendations, discuss these proposed actions, and solicit feedback on the EWG and any ideas for potential future directions of the group.

One of the goals of the EWG was to provide National Grid with a set of prioritized recommendations that can be used to propose enhancements to National Grid energy efficiency programs in the 2022 Annual Plan. The topic-specific meetings (meetings 2-5) resulted in a set of fourteen top recommendations, including a set of five prioritized recommendations that emerged to the top through a vote in the Program Budgets meeting. Using the EWG's top fourteen recommendations, National Grid proposed a set of actions that would enable the company to make progress towards improving the advancement of equity with its energy efficiency programs and presented these recommendations during the last meeting. The EWG's top fourteen recommendations, including the five prioritized recommendations, and National Grid's proposed actions can be found in National Grid's 2022 Annual Plan.

After National Grid's presentation, EWG members engaged in a discussion to provide feedback on their proposed actions. Generally, EWG members were supportive of National Grid's proposed actions with several members specifically referring to these proposed actions as "solid steps forward", "a great start" and "a great beginning". This language reinforces the perspective that equity is a journey and, while these proposed actions can make a significant impact, there is still ways to go to achieving truly equitable programming and resulting outcomes. Several members also mentioned the importance of implementation. While the inclusion of these proposed actions in the 2022 Annual Plan is significant, the way these actions are implemented can further advance equity or can be a hinderance. Many EWG members expressed a desire to monitor the progress of these proposed actions, assuming they are approved by the PUC, and continue to meet with National Grid in an advisory capacity to ensure and support effective implementation.

There were some proposed actions, where EWG members had additional, specific feedback. For example, in response to National Grid's proposed actions for top Recommendation #1 to translate direct mail more consistently into Spanish and initiate an effort beginning with Hispanic customers to utilize new linguistic and cultural elements for web pages, customer toolkits, call-center support, and third-party partners, one participant noted that additional language capacity is needed beyond English and Spanish given the diversity of residents in Rhode Island. In addition, in response to National Grid's proposed actions for Recommendation #9 to establish a regular report that shows participation for their EnergyWise, multifamily, and income-eligible, single-family programs at the zip code level, one participant mentioned that it might be helpful to track customer data at levels more granular than zip code, such as the census tract level. Lastly, in response to National Grid's proposed recommendations for Recommendation #12 to continue its current background check policies, one participant noted that one potential area for improvement of the current policy would be to exhibit transparency around the background check process so that candidates know that they weren't selected for a position because of issues with their background check. This recommendation emerged as a best practice from a review conducted during the process to revamp the background check policies for all Rhode Island's state



licensure. As part of the passage of the [Fair Chance Licensing legislation](#) there were two major components of expanding equitable opportunity to professions that require background checks. One is to narrow the scope of which issues are disqualifying to only those issues that are directly relevant to the safety and well-being of program participants. The second is to ensure transparency so that applicants know and understand what the basis of their disqualification has been and are provided an opportunity to correct or rebut information relied on in making the decision. In this context transparency includes both notice of the basis for disqualification *and* an opportunity to correct or challenge that basis as incorrect or not relevant.

The second part of the meeting included a debrief of the six EWG meetings and a discussion of the potential future of the EWG. A survey was sent to EWG members prior to the meeting to solicit feedback. There were two questions about the value of the EWG and four questions on the desired future of the EWG. The results of the survey are detailed in the Appendix.

Every survey respondent thought the EWG meetings were valuable. In particular, the top two qualities that EWG members found the most valuable were the opportunity to 1) work collaboratively to develop specific recommendations for National Grid and 2) meet other stakeholders interested in Rhode Island equity issues. All survey respondents thought that EWG meetings should continue beyond this initial phase, meet at least twice a year with most respondents preferring to meet quarterly, and include other members such as National Grid clients, Habitat for Humanity, more grassroots advocacy groups, religious institutions, and industry representatives. In addition, survey respondents offered ideas for what the objective of the EWG should be. These ideas include serving as an advisor to National Grid to offer new and refined recommendations, monitor the progress and implementation of recommendations, evaluate the equity impact of the recommendations and programs, and offer additional marketing and outreach strategies that can help promote National Grid's programs. Based on this feedback, it seems that this EWG was a worthwhile initiative that National Grid can use to continue to refine its programs and work towards a more equitable set of energy efficiency programs.

In the 2022 Annual Plan, National Grid proposed a set of actions, driven by the EWG's recommendations. These proposed actions include a commitment to continue convening the EWG on a quarterly basis with the goal of updating the group on its implementation progress and continuing to leverage the group's experiences and expertise. For more detailed information on National Grid's proposed actions, refer to National Grid's 2022 Annual Plan.



## Acknowledgements

The Green & Healthy Homes Initiative (GHHI) would like to thank:

- All the Rhode Island advocates that have continuously pushed National Grid to develop, implement, and deliver their energy efficiency programs more equitably and that resulted in National Grid's proposal and commitment to hosting this Equity Working Group.
- National Grid, specifically Amy Vavak and Laura Rodormer, and Rhode Island Office of Energy Resources (OER), specifically Becca Trietch and Nathan Cleveland, for co-hosting the Equity Working Group.
- Each of the EWG members for their participation and engagement through the process
- Each non-EWG member that devoted time to providing their perspective
- Brian Kearney and Vin Graziano from RISE Engineering and Paul Salera from Westbay Community Action for donating their time to speak to the EWG on the panel during the Workforce Development meeting.



## Appendix

### 1. ABOUT GREEN & HEALTHY HOMES INITIATIVE

The Green & Healthy Homes Initiative (GHHI) is a national organization with the mission dedicated to addressing the social determinants of health and the advancement of racial and health equity through the creation of healthy, safe and energy efficient homes. By delivering a standard of excellence in its work, GHHI aims to eradicate the negative health impacts of unhealthy housing and unjust policies for children, seniors and families to ensure better health, economic and social outcomes for low-income communities of color. The vision of our work is to advance health and racial equity through healthy housing, with a focus in limited-income communities of color.

GHHI is the largest healthy homes organization in the country, operating in over sixty-five communities and states, focused on improving housing quality and establishing public-private partnerships that allow local governments to efficiently and effectively utilize resources related to housing. GHHI has worked to design and implement policies and programs at the federal, state, and local level that promote healthy, energy efficient, and climate friendly housing. In Rhode Island, GHHI aligns and braids housing, health, and energy efficiency resources to offer a holistic set of services to meet the housing needs of families and children, offers healthy homes training for Spanish-speaking contractors in partnership with RI Builders Association, manages Attorney General Funds to support comprehensive interventions in different jurisdictions, partners with Integra Community Care (Accountable Care Entity) to deliver asthma and healthy homes services to 10 homes of Integra members with asthma, and provides healthy housing training to residents and contractors in Central Falls, RI.

### 2. EWG Guidelines and Expectations

Below are the guidelines and expectations that guided each EWG meeting. Meeting attendees shall:

- Make every attempt to attend every meeting on time
- Share the oxygen – ensure that all participants who wish to have an opportunity to speak are afforded a chance to do so
- Listen to other points of view and try to understand differing viewpoints and other interests
- Maintain a focus on collaboration and solutions
- Share information openly and respectfully
- Make sure information given is accurate
- Remain flexible and open-minded
- Review meeting notes and documents prior to next meeting
- Respect the privacy of the meeting
- Meeting notes are for participants only
- What is said during meetings is important, who said it is not
- Make sure information given is accurate.
- Remain flexible and open-minded.

### 3. Additional Perspectives and Recommendations from Non-EWG members

Separate from the EWG process, GHHI was able to connect with several organizations to incorporate their perspectives and recommendations. GHHI met with the Rhode Island Office of Healthy Aging, Integra Community Care Network, Green Energy Consumers Alliance, and a representative from the





Housing Resources Commission. Each organization was then sent a list of questions (below) that represent similar questions that were posed to the EWG. Given each respondent had different experience and expertise on equity and National Grid's programs, respondents were given the option to respond only to questions that they felt comfortable answering. As a result, each organization did not respond to all questions. To maintain anonymity, all responses from each respondent were organized by question, compiled into one list, and included below. Since these organizations were not a part of the EWG and did not attend any meetings, they are unaware of the nature of EWG conversations. Therefore, some of the perspectives and recommendations may coincidentally be like ones posed by the EWG.

- Introductory meeting
  - o What does equity mean to you?
    - Equity to us mean to promote the values of diversity and inclusion by honoring lived experience and creating opportunities for all Rhode Islanders to live and age with dignity and purpose.
  
- Marketing and Outreach
  - o What does equitable marketing and outreach mean to you?
    - Equitable marketing and outreach mean to identify the most vulnerable communities – knowing who to reach, especially marginalized populations, by leading with a racial and social lens. At OHA, we partner with organizations across the state to equip our constituents with all the resources they need.
    - The ability to convey a message in a way that allows people from different backgrounds to understand that message
    - Multilingual marketing opportunities
    - Simple marketing language that is sensitive to customers with varying educational backgrounds
    - Everyone should know that these opportunities are available
  - o What are strategies that can help us achieve equitable marketing and outreach?
    - Phone banking
    - Mail postage paid flyers and mailers
    - Print signage in multiple languages
    - Social media
    - Representation is great...but not enough
    - Making sure language is simple and easy to understand (not just the standard 5<sup>th</sup> grade reading level recommendation) but making sure it takes cultural differences into consideration. (i.e. idioms may be difficult for certain groups to understand)
    - Make use of visuals, so nonnative English speakers can understand message without having to read text
    - Research demographics in the community to whom you're trying to market, and make sure translated materials are easily available in top languages spoken in that community



- Get creative about where you're marketing, to make sure information is accessible to different groups (i.e. community spaces, barber shops, churches, etc.)
  - Ask the community (i.e. conduct focus groups to learn what equitable marketing means to the community & what strategies they recommend)
  - Avoid using jargon
  - Be mindful that some languages have different dialects (ex. Spanish has over 20 different dialects from different countries so using simplified Spanish could help to make marketing broadly accessible)
  - Incorporate marketing strategies or different abilities (i.e. building the capacity for website information to be accessed auditorily for people with vision impairment)
  - Conduct marketing through social media and social service agencies
  - Ensure that the "right" messengers are utilized to reach specific target audiences
- Metrics and Data Collection
- What should the goals of the energy efficiency programs be?
    - Lowering of energy bills
  - Which benefits of energy efficiency should be captured?
    - Lower bills
    - Less energy usage
  - How do we ensure that the most vulnerable customers are benefitting?
    - Before launching a marketing campaign, conduct focus group & survey group to see whether they think the campaign is equitable
    - Not sure if this is possible, but for digital marketing, including social media, track the number of clicks, likes, views, shares, & who/where they're coming from
    - Engagement rates: after creating a marketing campaign to engage new groups, track how many people actually engage with whatever that initiative is
    - Following up on program impact after services are delivered
    - Providing services proactively to customers that National Grid knows are struggling to pay their bills (i.e. offering discounted rate once National Grid recognizes that the customer is struggling and connecting those customers with energy efficiency programs)
    - Ensure that following any information provided on customer energy use that there are specific action steps that National Grid provides customers to help them use less energy and pay lower bills.
    - Track the number of renters being served
    - Track demographic information of customers and program recipients
    - Move from a savings as the primary metric governing these programs to a broader benefits metric
    - Create equity-based performance incentive mechanisms (i.e. incentives for reaching the renter participation goal or an income-eligible participation goal)
- Workforce Development and Training



- How can we ensure that the energy efficiency workforce is as diverse as possible?
  - We can ensure it to be diverse by including people with variety across several different categories, such as religion, culture sexual orientation, language, educational backgrounds, skills, and abilities.
  - Reevaluate current job descriptions and remove any qualifications that aren't completely necessary for the role
  - Get creative about where you're posting job opportunities—if you'd like to prioritize hiring in a certain community, then ensure your job postings are reaching that community
    - Collaborate with community leaders & health equity zones and regularly share job opportunities with these groups, so they can share directly with community residents
  - Put together a focus group of community residents and ask them this question
- What barriers exist for entry and retention of potential energy efficiency workers?
  - Barriers to entry: Qualifications; job postings not reaching specific communities
  - Barriers to retention: not creating a comfortable environment that takes into account cultural differences; an environment where employees may feel singled out/ don't have peers that look like them or share similar experiences/ backgrounds
  - There is sometimes a bias towards hiring individuals that can complete trainings quickly, while some individuals require more time based on their differing abilities.
- What recommendations do you have that can overcome these barriers?
  - Ensure that there are jobs and positions available for people of different abilities
  - Provide specialized trainings for entry level positions that are accessible to folks at every level of abilities
- Program Budgets
  - What does an equitable energy efficiency budget look like?
    - (No responses)
  - How would you review a budget for an equitable allocation?
    - (No responses)
  - Which recommendations would have the most significant impact on equity?
    - Devote more of the budget to income-eligible and moderate-income residential customers
    - Expand offerings to moderate income customers
- Future of the EWG
  - If the EWG, would continue:
    - How would you want that engagement to look?
      - To connect people in the community with skills and abilities to jobs that can help them thrive.



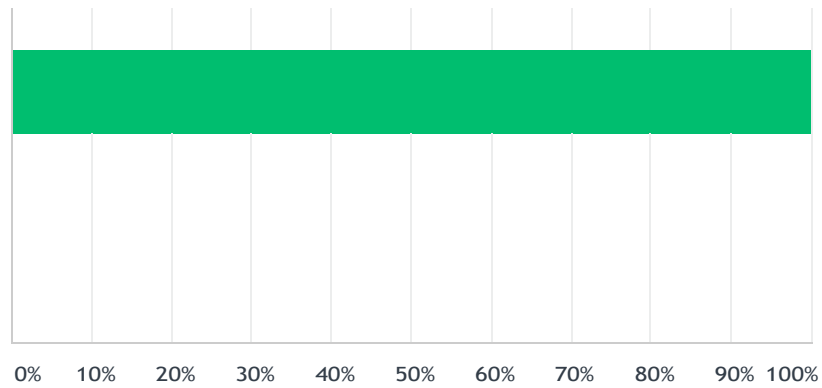
- I'm not sure what the current group looked like since I wasn't able to attend the meetings, but from personal experience with organizing working groups, I know that it's often easier to engage CBO representatives than residents. If your working group was mainly comprised of CBO representatives, I'd recommend figuring out ways to get community residents involved with the group... and creating an environment where residents feel comfortable providing feedback (i.e. ensuring there's an interpreter, ensuring materials are presented in a clear & simple way, etc.)
- What would you want the objective to be?
  - Discuss strategic ways to meet employer demand and ensure particular groups are prioritized.
  - Align on priority actions that could potentially be included in future legislation that would alter the program services and delivery
- How often should the group meet?
  - Bi-monthly meetings.
  - Monthly, ideally not during the summer months.



4. Survey: Evaluation of EWG and Future Directions

Q1 Did you find value out of this EWG?

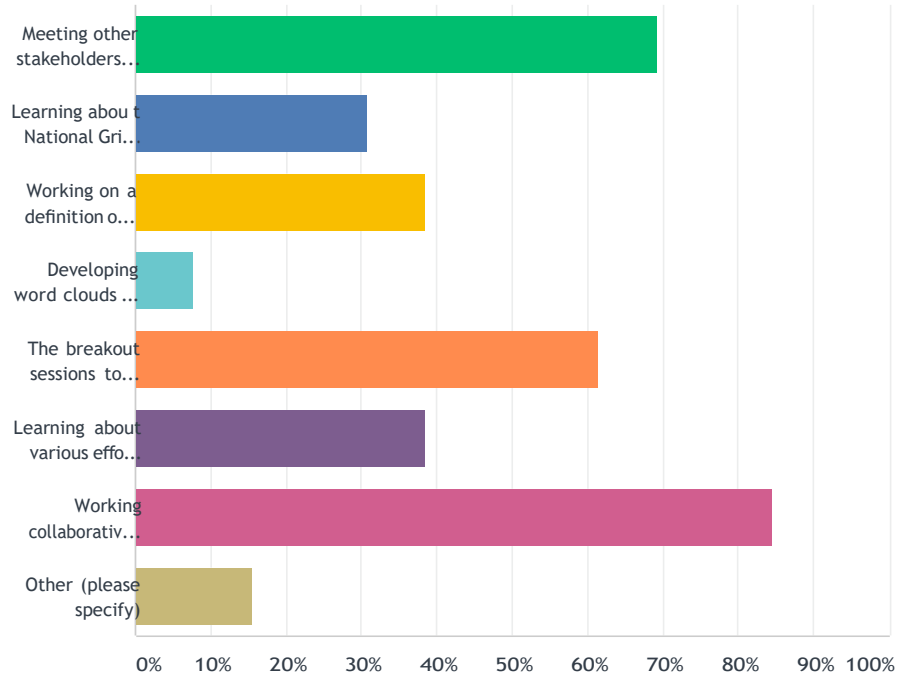
Answered: 13 Skipped: 0



| ANSWER CHOICES | RESPONSES |    |
|----------------|-----------|----|
| Yes            | 100.00%   | 13 |
| No             | 0.00%     | 0  |
| TOTAL          |           | 13 |

## Q2 What did you find valuable in the EWG?

Answered: 13 Skipped: 0

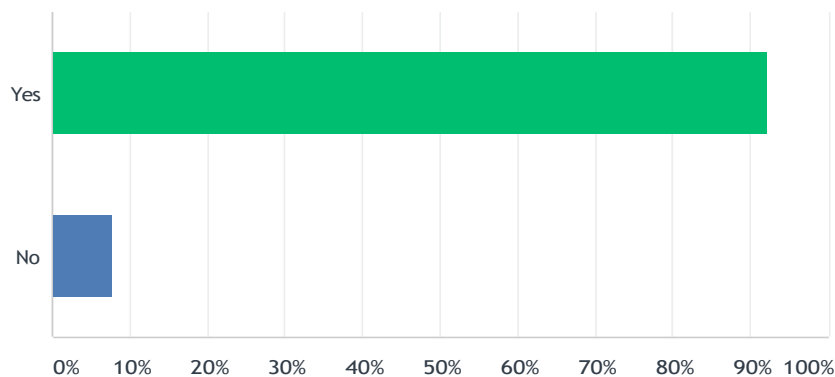


| ANSWER CHOICES   | RESPONSES |
|--|-----------|
| Meeting other stakeholders interested in RI equity issues  | 69.23% 9  |
| Learning about National Grid's programs and efforts to call out and/or add components of equity within their EE Programs | 30.77% 4  |
| Working on a definition of equity  | 38.46% 5  |
| Developing word clouds to understand the priorities of EWG participants  | 7.69% 1   |
| The breakout sessions to discuss and document relevant information and ideas.  | 61.54% 8  |
| Learning about various efforts in RI that are addressing, or pursuing, steps to achieve equity                           | 38.46% 5  |
| Working collaboratively to develop specific recommendations for National Grid  | 84.62% 11 |
| Other (please specify)   | 15.38% 2  |
| Total Respondents: 13  |           |

| # | OTHER (PLEASE SPECIFY)   | DATE               |
|---|--|--------------------|
| 1 | Sharing ideas with other stakeholders and NG to advance and center equity in NG programs                             | 8/24/2021 10:40 AM |
| 2 | To start a new process that will evolve over time with key organizations at the table to make a difference over time | 8/24/2021 10:33 AM |

### Q3 Should this EWG continue?

Answered: 13 Skipped: 0



| ANSWER CHOICES | RESPONSES |
|----------------|-----------|
| Yes            | 92.31% 12 |
| No             | 7.69% 1   |
| TOTAL          | 13        |

Q4 If the EWG continues, what should the objective of the group be?

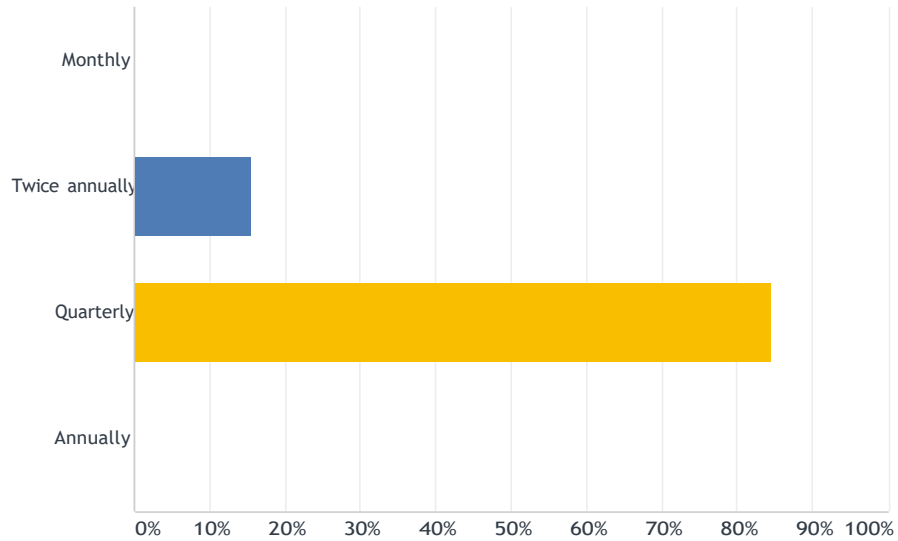
Answered: 13 Skipped: 0

| #  | RESPONSES  | DATE               |
|----|--|--------------------|
| 1  | Advise National Grid on marketing, outreach strategies to foster equity and inclusion  | 8/24/2021 1:58 PM  |
| 2  | Advisory capacity to track National Grid implementations and outcomes progress and make recommendations as needed  | 8/24/2021 1:42 PM  |
| 3  | to generate a network of channels to help promote the RI EE Program through all the participating stakeholders.  | 8/24/2021 10:48 AM |
| 4  | Helping to evaluate programs and continue recommendations  | 8/24/2021 10:42 AM |
| 5  | Monitor implementation of recommendations, continue to develop and refine additional recommendations, support a continued equity focus in ALL NG programs and priorities   | 8/24/2021 10:40 AM |
| 6  | for check ins /coordination  | 8/24/2021 10:36 AM |
| 7  | Since Equity work is not a singular event, the EWG should continue to home in and evolve the work and provide advisory role in the implementation.   | 8/24/2021 10:36 AM |
| 8  | Monitor implementation of recommendations.   | 8/24/2021 10:33 AM |
| 9  | oversite of initial recommendations and bring stakeholders who did not participate   | 8/24/2021 10:33 AM |
| 10 | Assessing progress towards equity and revising strategies.   | 8/24/2021 10:27 AM |
| 11 | To be a voice and feedback to National Grid on equity issues, monitor progress of plan, suggest revisions/ fine tuning of the plan as needed; to urge National Grid to incorporate equity more broadly within its services and programs (not just energy efficiency) | 8/24/2021 8:51 AM  |
| 12 | Not sure   | 8/23/2021 11:46 PM |
| 13 | Explore how participating organization and other can support and/or collaborate with National Grid to advance equity initiatives. Conduct accountability check-ins with National Grid on the progress of their energy equity efforts.                                | 8/23/2021 8:07 PM  |



Q5 If the EWG continues, how often should the group meet?

Answered: 13 Skipped: 0



| ANSWER CHOICES | RESPONSES |           |
|----------------|-----------|-----------|
| Monthly        | 0.00%     | 0         |
| Twice annually | 15.38%    | 2         |
| Quarterly      | 84.62%    | 11        |
| Annually       | 0.00%     | 0         |
| <b>TOTAL</b>   |           | <b>13</b> |

## Q6 Who else should participate in an ongoing EWG?

Answered: 10      Skipped: 3

| #  | RESPONSES   | DATE               |
|----|---|--------------------|
| 1  | Customer/constituent  | 8/24/2021 1:58 PM  |
| 2  | Habitat for Humanity  | 8/24/2021 10:48 AM |
| 3  | We should reach out to and include more grassroots advocacy groups who work on equity issues in the community   | 8/24/2021 10:40 AM |
| 4  | not sure  | 8/24/2021 10:36 AM |
| 5  | n/a   | 8/24/2021 10:36 AM |
| 6  | Religious institutions, clients   | 8/24/2021 10:33 AM |
| 7  | Any stakeholders that would provide value. Perhaps more industry.   | 8/24/2021 10:27 AM |
| 8  | It would be nice to hear from a senior (as to post, not age) executive from RI National Grid at least once a year, to insure CEO/high level commitment to equity and inclusion. Correspondingly, it would be similarly useful to have head of DOER and the RIPUC hear about and commit to equity. | 8/24/2021 8:51 AM  |
| 9  | Consumers   | 8/23/2021 11:46 PM |
| 10 | National Grid clients and other community members directly impacted by National Grid services. Grassroots environmental equity organizations and grassroots economic justice organizations.   | 8/23/2021 8:07 PM  |