

**Cost-Effectiveness Report:  
National Grid's 2021 Energy Efficiency Plan  
and National Grid's 2021-2023 Energy  
Efficiency Three Year Plan**

**An Assessment and Report by  
EERMC Consultant Team**

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**Working on Behalf of the**



STATE OF RHODE ISLAND  
**ENERGY EFFICIENCY &  
RESOURCE MANAGEMENT COUNCIL**

**Submitted to the Rhode Island Public Utilities Commission**

**October XX, 2020**

## **Summary of Consultant Team Findings**

The Energy Efficiency and Resource Management Council (EERMC) Consultant Team finds that the *Annual Energy Efficiency Plan for 2021* (the “EE Plan”) and the *2021-2023 Energy Efficiency Plan* (the “Three Year Plan”), reviewed and approved by the Council on **October XX, 2020**, and to be filed **October XX, 2020** by National Grid (“the Company”), are cost-effective according to the “Rhode Island Test” (RI Test) and the historically referenced Total Resource Cost (TRC) test.

The EERMC submits these findings in compliance with the Least Cost Procurement (LCP) Standards adopted on July 23, 2020 by the Rhode Island Public Utilities Commission (PUC):

“The Council shall prepare memos on its assessment of the cost effectiveness of the EE Plans, pursuant to R.I. Gen. Laws §39-1-27.7(c)(5), and submit them to the PUC no later than three weeks following the filing of the respective EE Plans with the PUC, or in accordance with the procedural schedule set in the applicable docket.”

These findings and the remainder of this report were distributed to the EERMC on **October XX, 2020** and presented to the EERMC by the EERMC Consultant Team at its **October XX, 2020** meeting, where they were approved and adopted in a vote of the EERMC.

## I. Introduction

This report was prepared by the Consultant Team and the EERMC to help fulfill the requirements of R.I.G.L. § 39-1-27.7(c)(5) related to the Public Utility Commission's approval of National Grid's three-year procurement plan and related annual energy efficiency plans. Since 2010, the EERMC has directed the Consultant Team to prepare this report for all three-year and annual plans filed with the Commission. This version addresses National Grid's proposed *Annual Energy Efficiency Plan* ("the EE Plan") and *2021-2023 Energy Efficiency Plan* (the "Three Year Plan"), reviewed and approved/disapproved by the Council on October XX, 2020.

This report submits our finding that the EE Plan and Three Year Plan are cost-effective as evidence to the Commission. It also describes the nature and process of the review, and documents the professional experience and qualifications of the Consultant Team that performed the review.

In order to assess the cost-effectiveness of the EE Plan, the EERMC Consultant Team engaged in the following plan development and review processes:

1. Consistent and on-going oversight of actual National Grid energy efficiency planning and implementation activities through direct interactions with National Grid staff and participation in the EE Technical Working Group ("EE TWG", formerly the Collaborative Subcommittee process (documented in Section II).
2. Reviewing the details of National's Grid Benefit-Cost Models ("BC Models") for each of the EE Plan and the Three Year Plan drafts to ensure that they accurately reflect the proposed program designs in the Plans, recent evaluation results, and relevant TRM inputs (Section III)

## II. Oversight of Planning and Implementation Activities

The EERMC, consistent with its statutory obligations under the 2006 Comprehensive Energy Act, continues to play an involved and active role with National Grid to guide, facilitate, and support public and independent expert participation in the review, oversight, and evolution of utility energy efficiency procurement and program implementation. The EERMC believes this input is critical to having the energy efficiency programs and new cost saving mechanisms evolve into resource acquisition tools that can effectively implement the Rhode Island law to procure all cost-effective natural gas and electric energy efficiency, and to ensure that this continues to be the case as the markets for a range of energy efficiency technologies mature and require new measures, services and delivery approaches.

The EERMC has met its review and input requirements both at its regularly scheduled meetings with National Grid and through EE TWG meetings and ad hoc communications as needed. The TWG is comprised of EERMC members; the EERMC Consultant Team; RI Office of Energy

Resources (OER); Acadia Center; the Division of Public Utilities and Carriers and support from its consultant group; and Green Energy Consumers Alliance. Other groups that have at times participated in TWG meetings include TEC-RI, the city of Providence on municipal issues and the RI Center for Justice on income eligible issues. National Grid coordinates and hosts the meetings and has energy efficiency representatives in attendance at all meetings.

For the EE Plans, the Consultant Team reviewed and provided detail comments on the first draft of the Three Year Plan on July 3 and on the first draft of the 2021 Annual Plan on September 10. A second and final draft of a combined 2021 Annual Plan and full Three Year Plan was issued on October 1. The Consultant Team reviewed this and provided recommendations to the EERMC ahead of the October 8 EERMC vote.

### **III. EE Program Design and Evaluation Review**

The Consultant Team reviewed the draft and final EE Plan and Three Year Plan to assess the proposed program designs and the extent to which they and the associated cost-effectiveness analyses reflect recent evaluation results and relevant TRM inputs.

As a result of these activities, the Consultant Team communicated with National Grid analysts and sector managers to address pertinent issues and questions related to both program design and cost effectiveness. In numerous cases, this resulted in revisions to the Plan. Overall, our findings are that:

- The overwhelming majority of the modeling and cost-effectiveness assumptions reviewed were sufficiently supported, either in their original form or after iterating based on review provided during this process. Any issues identified in the BC Models or in the Plan were addressed at the portfolio and program level by National Grid's analyst team.
- National Grid appropriately used new results from both Rhode Island and relevant Massachusetts evaluations that were recently completed to update multiple measure baselines, net-to-gross ratios, measure lives, and other measure assumptions.
- The objectives of the Least Cost Procurement Standards were followed to ensure that program designs and the resulting implementation secure cost-effective energy efficiency resources that are lower than the cost of supply.
- National Grid's processes for revising their cost-effectiveness inputs and assumptions were thorough and comprehensive. National Grid appropriately adjusted baselines for new building codes and federal standards, and incorporated the latest findings from evaluation studies. In addition, the Company updated anticipated program costs based on recent experience and new market information.

## IV. Cost-Effectiveness Review

The final EE Plan presents the cost-effectiveness of the proposed 2021 programs using both the TRC and the RI Test, while the final Three Year Plan presents the cost-effectiveness of the proposed 2021-2023 programs. Table 1, below, summarizes the results in terms of benefit-cost ratio, covering both plans, as the 2021 Plan values are identical to the 2021 values in the Three Year Plan. Considering just the TRC, both the electric and gas portfolios are robustly cost-effective; electric portfolio benefits are roughly double the total costs of the investments in 2021 and in both the base and high scenarios for 2022 and 2023, while gas portfolio benefits exceed costs by 60% or more in all years and scenarios.

**Table 1. RI Test and TRC Test BCR Values**

BCR (TRC Test/RI Test)	2021	2022 (base)	2022 (high)	2023 (base)	2023 (high)
<b>Electric</b>	2.01/4.31	1.87/4.02	1.91/4.08	1.93/4.13	1.99/4.20
<b>Gas</b>	1.61/3.00	1.66/3.03	1.66/3.04	1.67/3.04	1.67/3.06

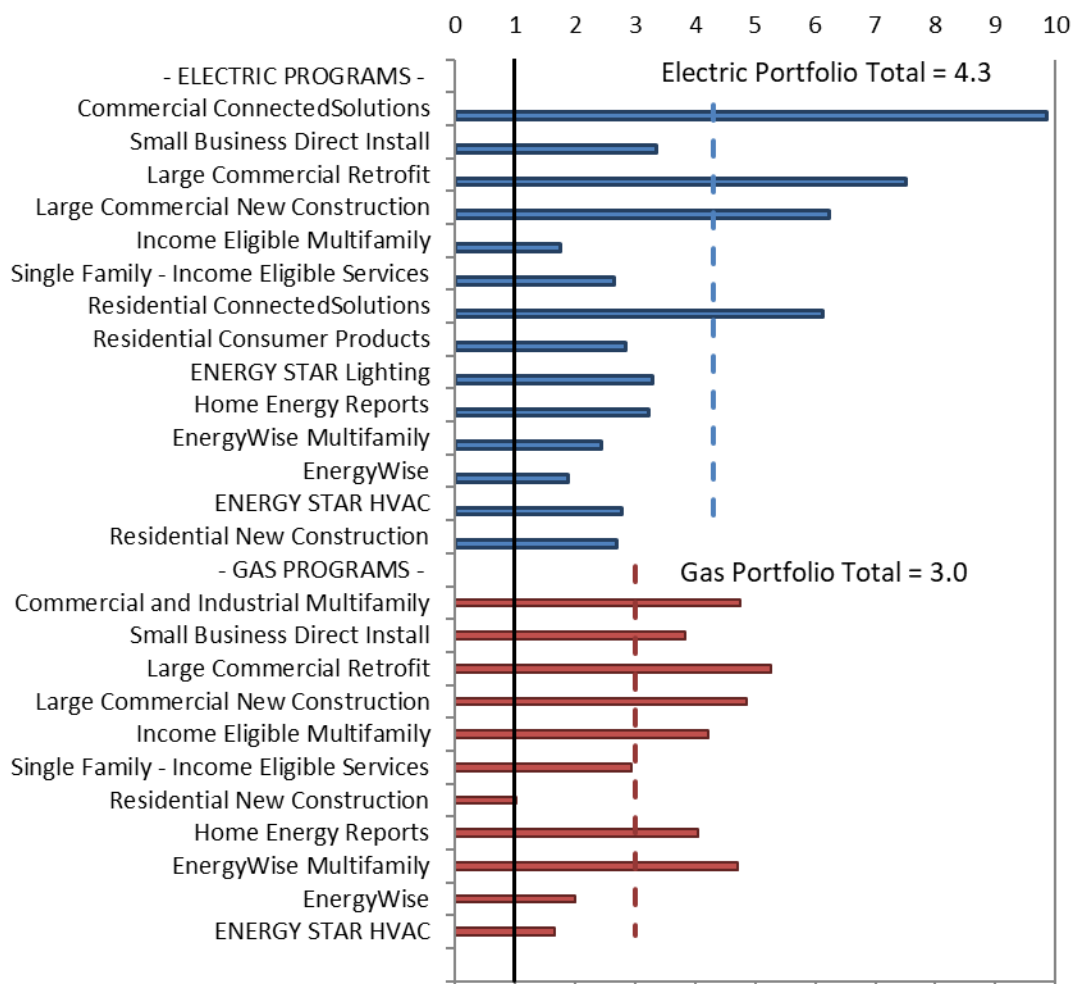
As described above, the RI Test seeks to include a more complete set of benefits that better reflects state policy. The benefits associated with reductions in greenhouse gas (GHG) emissions have been included by relying on the 2018 version of the *Avoided Energy Supply Costs in New England* report (AESC). This report projects a long-term value of reductions in carbon emission of \$68 per short ton. A small portion of this value – representing the near-term value of carbon reductions given current and likely future carbon regulation – is already included or “embedded” in the avoided energy costs that compose a portion of the benefits under the TRC Test. Therefore, the RI Test includes the remaining value of carbon emissions up to the full \$68 per ton value. The 2018 AESC also quantified benefits for non-embedded nitrogen oxide (NOx) reduction benefits. These are much smaller than the non-embedded GHG reduction benefits, but they do appear on the figures below as an additional benefit under the RI Test.

Increased spending from installing energy efficiency measures creates jobs in the local economy. Participant and program spending on efficiency often has positive benefits to the local economy as a greater portion of total efficiency costs are spent locally than is the case for the costs of additional supply. Yet these benefits are typically not included in TRC benefit calculations because they are difficult to quantify, requiring a regional economic model. Such an analysis was

conducted for National Grid in 2014, and updated in 2019, the results of which form the basis for the economic benefits included in the RI Test.<sup>1</sup>

The Consultant Team has reviewed the quantification of the GHG reduction and economic benefits in the RI Test and finds them to be appropriate. Figure 1 presents the results of the RI Test for the 2021 Annual Plan in graphical form, and again demonstrates that both the electric and natural gas efficiency programs have a BCR greater than or equal to 1.0, as required by the Commission-approved Least Cost Procurement Standards and R.I.G.L. § 39-1-27.7 (c)(5).

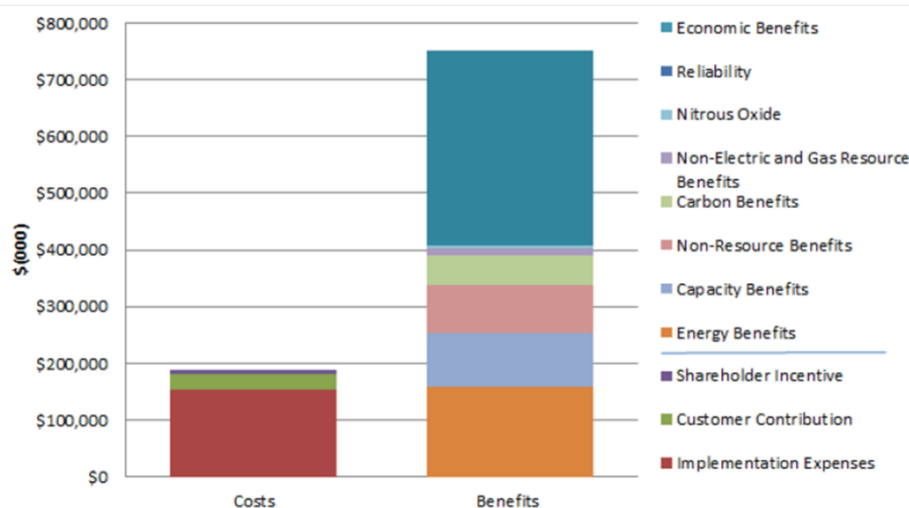
**Figure 1. RI Test Benefit Cost Ratios by Program**



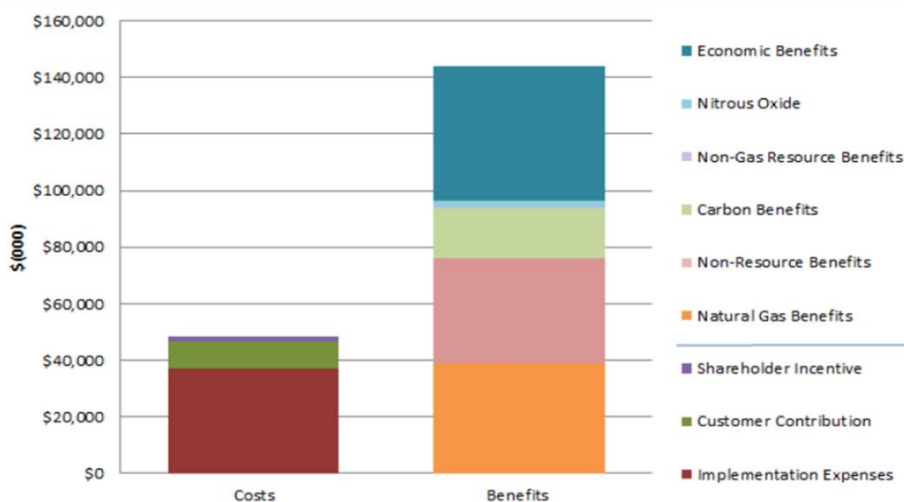
<sup>1</sup> Macroeconomic Impacts of Rhode Island Energy Efficiency Investments: REMI Analysis of National Grid's Energy Efficiency Programs, National Grid Customer Department, November, 2014.

Figures 2 & 3, below, show the major components of both the costs and benefits of the portfolios for the 2021 EE Plan. The top three sections of the benefits chart are the components that are included only in the RI Test; the lower sections are included in both the TRC and RI Tests. As noted in the table above, the electric and gas portfolios are both cost-effective using the more restrictive TRC as well as the RI Test. On the cost side, note that the BCR calculation includes an allowance for National Grid's shareholder incentive at the nominal or "target" value.

**Figure 2. 2021 Planned Electric Costs vs. Benefits**



**Figure 3. 2021 Planned Gas Costs vs. Benefits**



The Consultant Team also reviewed National Grid’s assessment of the cost of efficiency as compared to alternatives; the LCP standards require that efficiency be lower cost than acquisition of additional supply. The 2021 Plan reflects the updated guidance for assessing whether the cost of efficiency is less than the cost of supply. The Plan uses the RI Test as an appropriate starting point to determine which costs to include in this assessment. This test captures the aspects of the Docket 4600A Framework that pertain to energy efficiency programs. The source for many of these values is the “Avoided Energy Supply Components in New England: 2018 Report” (2018 AESC Study) prepared by Synapse Energy Economics for the AESC 2018 Study Group, June 1, 2018. The benefits in the RI Test are associated with the cost savings to Rhode Island from investing in energy efficiency instead of investing in additional energy supply. For the purpose of the RI Test, these values are described as a benefit of energy efficiency in the form of avoided costs. It is reasonable to assume that these 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 Plan enumerates all of the cost and benefit categories included in the RI Test and indicates which are included as a cost of efficiency, which are included as a cost of supply, and which are excluded from this comparison. The major categories that are excluded are economic development benefits, non-energy resource impacts such as water and sewer cost reductions, and other non-energy impact benefits other than those associated with income eligible rate discounts and reductions in arrearages. Tables 2 and 3, drawn directly from the Three Year Plan tables 36 and 37, reflect the finding that both the Annual Plan and Three Year Plan contain proposed programs that are less than the cost of supply.

**Table 2. Comparison of Cost of Electric Energy Efficiency and Alternative Supply**

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



**Table 3. Comparison of Cost of Natural Gas Energy Efficiency and Alternative Supply**

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

Further, based on our participation in the discussions regarding this comparison and our review of the Plans, we believe that the Company has appropriately assessed the cost of efficiency and the cost of supply and determined that the former is less than the latter.

In summary, the EERMC Consultant Team concludes that the EE Plan and Three Year Plan meet the cost-effectiveness requirements of R.I.G.L. § 39-1-27.7(c)(5) as well as the revised LCP Standards guidance regarding the cost of efficiency and the cost of supply.

## V. Conclusion

For the reasons stated herein, the EERMC and the EERMC's Consultant Team find that National Grid's *Annual Energy Efficiency Plan for 2021* and *2021-2023 Energy Efficiency Plan* are cost-effective and lower cost than the acquisition of additional supply pursuant to R.I.G.L. § 39-1-27.7 (c)(5).