STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

# MEETING MINUTES

**Thursday, December 8, 2016 | 3:30 - 5:30 PM**
Conference Room B, 2nd Floor, Department of Administration, Providence, RI

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**Members in Attendance:** Abigail Anthony, Bob Bacon, Joe Cirillo, Roberta Fagan, Carol Grant, Anthony Hubbard, Jennifer Hutchinson, Tom Magliocchetti, Michael McAteer, Shigeru Osada, Chris Powell, Karen Verrengia, Diane Williamson

**Members Absent:** Michael McAteer, Betsy Stubblefield Loucks

**Others Present:** Brian Buckley, Kat Burnham, Mike Guerard, Mark Kravatz, Courtney Lane, Jeff Loiter, Scudder Parker, Rachel Sholly, Becca Trietch

## 1. Call to Order

Chairman Chris Powell called the meeting to order at 3:38 PM.

## 2. Approval of Meeting Minutes

Karen Verrengia made a motion to approve the minutes. Abigail Anthony seconded and all approved.

## 3. Executive Director Report

Commissioner Carol Grant of the Rhode Island Office of Energy Resources (OER) reported that the Public Utilities Commission (PUC) hearing on Docket #4600 is still going. She also mentioned the greenhouse gas emissions reduction plan will be coming out soon. Also, the Commissioner referenced that it is Ms. Sholly last meeting, since she will be leaving State service at the end of the 2016.

## 4. Executive Committee Report

The consultant team brought to the Committee's attention that OER, National Grid and the consultant team have been discussing a partnership agreement with NEEP (Northeast Energy Efficiency Partnerships) for 2017. Based on what the group decides would be useful to Rhode Island, NEEP will provide technical assistance and resources related to various efficiency efforts in the state. Because the funds will be coming out of National Grid's 2017 budget but weren't called out specifically in the Plan, the consultant team thought the Council might want to weigh in on the total amount and tasks included in the agreement. There was discussion on whether this is a Council issue or if it could be delegated to the consultant team. The Committee asked to see a proposed scope of work for 2017 and rationale explaining why this is a good use of ratepayer dollars. Then the Committee will decide whether or not it needs to go to the full Council.

Chairman Powell also announced that he and Commissioner Grant will meet with Ken Payne, Chair of the Distributed Generation Board to discuss how the EERMC and DG Board can begin working together.

## 5. Policy and Planning Issues (50 min)

### *a) Vote on Final Recommendations on Savings Targets and Standards Revisions (30 min)*

Mike Guerard of the consultant team presented the final version of the consultant team's memo on the 2018-2020 savings targets and energy efficiency and system reliability standards (LCP Standards) revisions. Abigail Anthony noted that Danny Musher recommended a small change to the LCP Standards

on page 45 section 2.3.C. He wanted to make sure that in the definition of system reliability, the goal is not only to reduce demand but also actively manage when power consumption is taking place. Shigeru Osada asked about the summary table. Mr. Guerard explained that the summary table represented the achievable base and evolving savings potential that informed the proposed targets. Consensus of the working group was that subset of potential from expected innovation could be added on to the base potential. The targets can be modified for future annual plans based on new data-driven evidence of shifts in potential due to innovation or other market forces.

Mr. Osada asked about the EnergyWise 10% stating that it was a steep decrease. Courtney Lane explained that there were a lot of lighting savings and with federal standards changing, National Grid will not be able to claim as much savings from lighting.

Mr. Osada asked about the top ten saving trends, and the top ten measures which was not shown over time, from past to present. He inquired as to why National Grid can't provide such data.

**Karen Verrengia motion to approve the final recommendations on savings targets and LCP standards revisions, draft date 12-2-16, with the small change to the standards which added "or manage" to section 2.3.C. She also directed the C-Team to work with counsel to file the memo and cover letter to the PUC within two weeks of approval. Bob Bacon seconded it and all approved.**

*b) Review Dunsky Memos*

The consultant team presented three memos from Dunsky Energy Consulting (DEC): "Overview of Activities and Results", "The Impact of Financing on Energy Efficiency Target Setting" and "An Initial Review of the Cadmus LCI OBR Evaluation Report." *(see attached)*

Ms. Lane stated that National Grid disagrees with some parts of the Evaluation Report and would like the opportunity in the future to speak to some of those points. Chairman Powell noted that DEC presented an interpretation of the results based on the information at hand, and in its upcoming role will continue to engage with National Grid, and stakeholders, to get data sufficient to inform proper decision-making on future investments in financing.

## 6. Council Business

*a) Vote on Energy Expo Sponsorship*

Ms. Sholly presented a revised sponsorship proposal from the Rhode Island Builders Association (RIBA) for implementation of the 2017 Energy Expo at the Rhode Island Home Show as well as information reflecting the impact of previous Energy Expos *(see attached)*.

The council should outline specific metrics that would help better measure the extent to which the Council is fulfilling its mandate to promote public understanding of energy issues and use those metrics to more closely guide RIBA in their implementation of the 2017 expo. Telling the story of energy efficiency in Rhode Island is very important. People don't know about the RI great success story. This was followed by a discussion as to how we can share this success story with others, especially those who are not involved in the energy efficiency world. Tom Magliocchetti mentioned improving the council's outreach, and how we need a subcommittee to have someone take ownership. Karen mentioned this was a good job for an intern, and to have social media play a part in the overall communications effort. The consultant team should look at other states to get ideas on to how to approach this topic. It was recommended that a marketing/communications group be formed and include two EERMC members, the C-Team, and National Grid. This topic is going to be put on the next ExComm agenda.

Anthony Hubbard stated that he may be a conflict of interest because his organization partners with RIBA. He recused himself from the vote. Mr. Osada asked why this was being supported but not the TEC-

RI forum. Chairman Powell explained that RIBA is providing a service to the EERMC to help fulfill the council's outreach and education goals.

**Ms. Verrengia made a motion to accept the $80,000 sponsorship package, allocating $40,000 of EERMC funds, subject to National Grid's equal sponsorship. Mr. Bacon seconded it and all approved.**

*b) Review Draft Consultant Team Work Plan and EERMC Budget*

The consultant team presented a draft work plan outlining its proposed activities for 2017 *(see attached)*. The draft 2017 Council budget will be available for reference. Ms. Verrengia asked if career and technical students in high school could be engaged. Mr. Guerard suggested that the marketing/communications group could work on that.

The proposed consultant team scope includes four optional areas. The first is a process to 'support and share' the knowledge that each member of the council possess, i.e. by adding one or two retreats, more council meetings and/or sending out briefings. This way support can be provided on the complex topics, since many of the members don't deal with these topics day in and day out. The goal is to make sure all council members feel engaged and empowered to make good votes and decisions. Secondly, the consultant team will also explore options to hire an intern. Options for this will be covered at the next ExComm meeting. Third would be the development of an EERMC website and plan for consistent updates and maintenance to be coordinated by the consultant team. Finally, Demand Response Planning, Research and Analysis will be an important 2017 topic for the EERMC. Questions were raised as to how this opportunity can be used in RI. The focus of the last decade has been on aggressive, very effective energy efficiency investments. The time is coming now where these efforts need to focus on all kinds of new issues, Demand Response being one of them. In addition, strategic of electrification and discussion on Docket #4600 is important. The council asked the consultant team to have the capability to have someone with a real focus on how the Demand Response Opportunity can evolve in RI. What different programs can RI pursue, and/or what is already out there operating as energy efficiency? The council wishes to start exploring these topics, since they will be an emerging opportunity for RI as a whole.

OER agrees that these topics represent a significant opportunity for RI as we head into the 3-year planning cycle. These topics will help to frame out a strategic direction for the 3-year plan.

*c) Finalize 2017 Meeting Calendar*

The Council will be asked to finalize its meeting dates and times for 2017.

## 7. Public Comment

There was no public comment.

## 8. Adjournment

Mr. Cirillo made a motion to adjourn. Ms. Verrengia seconded and all approved. The meeting was adjourned at 5:12 PM.

# Meeting Materials

STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

# MEETING MINUTES

**Wednesday, November 10, 2016 | 3:30 - 5:30 PM**
Conference Room B, 2nd Floor, Department of Administration, Providence, RI

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**Members in Attendance:** Abigail Anthony, Bob Bacon, Joe Cirillo, Roberta Fagan, Carol Grant, Anthony Hubbard, Jennifer Hutchinson, Mark Kravatz, Tom Magliocchetti, Michael McAteer, Shigeru Osada, Chris Powell, Karen Verrengia

**Members Absent:** Betsy Stubblefield Loucks, Diane Williamson

**Others Present:** Robert Beadle, Brian Buckley, Kat Burnham, Gretchen Calcagni, Mike Guerard, Courtney Lane, Scudder Parker, Rachel Pinnons, Matthew Ray, Ben Rivers, Rachel Sholly, Nick Ucci, Muxi Yang

## 1. Call to Order

Chairman Chris Powell called the meeting to order at 3:33 PM.

## 2. Approval of Meeting Minutes

Karen Verrengia made a motion to approve the minutes. Abigail Anthony seconded and all approved.

## 3. Executive Director Report

Commissioner Carol Grant of the Rhode Island Office of Energy Resources (OER) reported that there has been a collaborative effort among Connecticut, Massachusetts and Rhode Island to go out into the market and look for cost-effective clean energy. That procurement has been underway since November 2015 and it concluded since our last meeting with an announcement of a series of projects. Rhode Island is a minor participant in terms of megawatt volume but learned a lot about the marketplace by participating in the process. The process has resulted in under-market renewables that have been designated for negotiations and will come before the Public Utilities Commission (PUC).

Through the Executive Climate Change Coordinating Council (EC4), OER is working on a greenhouse gas emissions report, which is due at the end of 2016, to meet the State's reduction goals. Consultants have been engaged to model various scenarios and pathways to achieve the goals. There was a good meeting yesterday, which the Governor attended, that emphasized that the targets are challenging but we are on track to meet the 2020 goals and can see pathways to reach the 2035 goals. Much of the ability to meet the 2020 targets is because of the efficiency work done in part by the EERMC.

Lastly, Becca Trietch will be taking the lead role in efficiency work on the OER staff when Rachel Sholly leaves at the end of the year. The two have been working together to ensure a smooth transition.

## 4. Policy and Planning Issues

### *a) Review Draft Savings Targets and Standards Memo*

Mike Guerard, Scudder Parker and Gretchen Calcagni from the consultant team presented a draft of its recommendations for 2018-2020 savings targets and proposed revisions to the energy efficiency and system reliability standards *(see attached)*. Shigeru Osada asked why the numbers have changed multiple times over the last few previews at the Council and Collaborative meetings. Mr. Guerard explained that

refinements continued to be made throughout ongoing discussions with National Grid. Mr. Osada said he was expecting to see the reasoning behind these numbers in advance of this meeting. He would also like to see the historical savings targets to compare. Mr. Guerard said that subsequent slides would address these questions to some extent and then offered to share and explain the extensive Excel workbook with him and any Council members who are interested in learning more about what goes into the targets setting. Karen Verrengia would like to see the graphs being presented today in the memo. Mr. Osada asked to see the top ten most impactful measures and how they influenced the targets recommendations. Chairman Powell reminded the Council that any feedback should be provided to the consultant team as soon as possible.

## 5. Updates on Energy Efficiency Programs and System Reliability Procurement

### *a) Review Third Quarter National Grid Program Results*

Representatives from National Grid presented the results of its energy efficiency programs for the third quarter of 2016 *(see attached)*. Chairman Powell asked if Wi-Fi thermostats have gone upstream yet, since it seems like a good opportunity. Mr. Ray said that it is still a mail-in rebate. Mr. Guerard said that upstream for lighting and other products has been very successful and there is a list of potential products to add to the upstream program.

## 6. Council Business

### *a) Review Third Quarter Budget Report*

Ms. Sholly presented the Council's expenses through the third quarter and remaining budget *(see attached)*.

### *b) Review Draft 2017 Budget and Related Items*

Ms. Sholly also presented a draft budget for 2017 including a preview of key consultant team tasks and a discussion of Energy Expo sponsorship *(see attached)*. Ms. Anthony asked OER to summarize whatever data is available on the impacts of the Energy Expo come up with a recommendation on sponsorship for the December Executive Committee meeting. Ms. Grant asked the Council to help think about additional ways in which could the Council could fulfill its mandate to educate the public on energy issues.

Mr. Guerard presented a few key tasks that could be proposed as part of the 2017 consultant team scope of work *(see attached)*. Chairman Powell felt that if the EERMC is going to create an internship program, it should open it up to other organizations in addition to URI. Ms. Anthony asked to see what tasks the intern would do. Joe Cirillo asked if this might be an opportunity for continuing education credits for the American Institute of Architects. Chairman Powell said that this would be more a policy-oriented position.

The Council was supportive of the consultant team taking on the tasks of redesigning and maintaining the EERMC website. Commissioner Grant said OER fully supports this, but if the EERMC decided it did not want the consultant team to take it on, OER would be happy to continue doing it.

Mr. Cirillo would like to use his connection to a U.S. general from Rhode Island to advocate to President-elect Trump for national codes and standards that all states would be required to adopt. Commissioner Grant cautioned that making codes uniform across the country may result in weakening existing codes but she would be happy to discuss it more.

Mark Kravatz proposed additional Council member education as a 2017 consultant team task. Chairman Powell noted that the Council could benefit from more information on renewable energy. Scudder Parker proposed that demand response work be a core component of the consultant team scope of work in 2017.

### *c) Vote on Revised Dunsky Contract Proposal*

The Council reviewed the revised contract extension proposal from Dunsky Energy Consulting for finance related services for an additional 12 months *(see attached)*. There is an 11% increase in the hourly rate, which was discussed at the last Council meeting. The revised proposal reduces the hourly rates and increases the number of hours for the same total amount. Mr. Parker felt that Dunsky was responsive to the Council's concerns. Tom Magliocchetti asked how the work will be validated. Mr. Parker said that they would bill on hours worked per a percentage structure and the consultant team would approve the payments jointly with OER. Mr. Magliocchetti expressed concern that there was not a clear deliverable. Ms. Anthony said that while there is not one culminating deliverable, like a report, there are specific activities happening that will need Dunsky's input, for example, the role of financing in the development of the next three-year plan as well as residential PACE.

**Joe Cirillo made a motion to approve the revised Dunsky finance contract and associated scope of work for $90,000 for 12 months. Ms. Verrengia seconded and all approved.**

### *d) Review 2017 Meeting Schedule*

Ms. Sholly explained that the meeting schedule proposes to move the full Council meetings to third Thursday of the month and to the larger conference room. The Council requested more time to check the proposed 2017 meeting schedule against their calendars *(see attached)*.

## 7. Public Comment

There was no public comment.

## 8. Adjournment

Mr. Cirillo made a motion to adjourn. Ms. Verrengia seconded and all approved. The meeting was adjourned at 5:12 PM.

DRAFT

EERMC CONSULTANT TEAM

# Recommended Targets for Electric and Natural Gas Energy Efficiency Programs & Proposed Amendments to the Least Cost Procurement Standards for the Years 2018-2020

Prepared for

STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

Prepared by:

The Rhode Island Energy Efficiency and Resource Management Council Consultant Team

Lead Authors: Mike Guerard, Scudder Parker, Gretchen Calcagni

With Support from Targets & Standards Sub-Committee: Abigail Anthony/EERMC; Jeremy Newberger, Courtney Lane, Muxi Yang/National Grid; Danny Musher/RI Office of Energy Resources

**December 8, 2016**

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# I. Introduction

This Memorandum presents proposed Three Year Savings Targets ("Targets") for Least Cost Procurement implementation by National Grid for the years 2018-2020 based on the process and analysis undertaken by the VEIC/Optimal Energy Consultant Team ("the Consultant Team") in support of the Energy Efficiency and Resource Management Council's ("EERMC") objective to submit these Targets to the Rhode Island Public Utilities Commission ("Commission" or "PUC") in December, 2016. The proposed Targets presented by the Consultant Team are for both Electric Energy Efficiency and Natural Gas Efficiency programs for annual saving in each of the three years, and are represented as a percentage of the electric and gas sales from a base year of 2015.[1]

In addition, the Memorandum presents proposed modifications to the Least Cost Procurement Standards ("the Standards" or "LCP Standards") which will guide utility planning, cost-effectiveness assessment, program design, and implementation strategy for that same three year period. The Standards revisions address both Energy Efficiency Standards ("EE Standards") and the System Reliability Procurement Standards ("SRP Standards") (collectively referred to as "Standards").

This is the first time that the presentation of the Targets and Standards has been formally combined in one filing. In the past two Targets and Standards cycles (2010 and 2013), the filing of the Targets has come first, usually in September of the year preceding the year in which the Three Year Plan is prepared and submitted, and the proposed edits to the Standards have been filed early in the year in which the Three Year Plan is developed. Both have, however, generally been addressed in a consolidated Docket.

## The Targets

This memorandum presents for the EERMC the Consultant Team's recommendations for savings targets for National Grid's upcoming 2018-2020 Energy Efficiency Procurement Plan ("Three Year Plan"). These targets are presented by the Consultant Team for consideration by the EERMC in their deliberations regarding the savings targets they will recommend to the PUC. These proposed targets have been developed in conjunction with the Targets and Standards Sub-Committee and have been approved by them as a recommendation to the full EERMC.

Electric and natural gas distribution companies are required by R.I. Gen. Laws § 39-1-27.7 System Reliability and least-cost procurement, subsection (c)(4) to file Three-Year plans for system reliability and energy efficiency and conservation procurement with the Commission. Pursuant to subsection (c)(5), the Commission is to consider the EERMC's evaluation and approval of the distribution utility's plan in issuing its order of approval of the plan.

[1] The 2015 year is the last complete year of actual sales, and is used as reference to consistently benchmark each of the three years covering 2018-2020. Similarly, the Targets set for the 2015-2017 derive the percentages from the 2012 actual sales.

In 2010, the legislature adopted the ratemaking concept of revenue decoupling, in R.I. Gen. Laws § 39-1-27.7.1. Pursuant to § 39-1-27.7.1(f), the EERMC was required to submit proposed energy savings targets to the PUC by September 1, 2010. The purpose of these targets was to give the utility guidance on the potentially available cost-effective efficiency resources in the state that would feed into the normal Least Cost Procurement ("LCP") Three-Year and Annual efficiency program planning processes under § 39-1-27.7. During these normal planning processes required by Rhode Island law, the efficiency programs and budgets are developed by the utility and the cost-effectiveness of the budgets and programs is reviewed and approved by the EERMC before being filed with the Commission for their consideration and action. In addition, the process provides for crucial and substantial input and contributions from diverse stakeholders during the development of the Three Year efficiency procurement and Annual efficiency program plans ("Annual Plans").

While Rhode Island Law § 39-1-27.7.1(f) only required one specific filing date for targets (September 1, 2010), it is understood as a responsibility of the Commission, and by extension the EERMC, under § 39-1-27.7(e)(4), that "the commission shall review and approve with any necessary amendments performance-based energy savings targets developed and submitted by the Rhode Island energy efficiency and resources management council." The LCP process is legislatively mandated to continue through 2024, and the submittal of savings targets for approval has in the past served to support the LCP Three-Year planning process. Therefore, the EERMC decided (and National Grid and other members of the Collaborative agreed) to continue the development of proposed targets based on achievable potential to assist the distribution utility, the stakeholders, and the Commission in their development and evaluation of Three Year Plans, including for this period of 2018-2020.

It is important to re-iterate the purpose of these Targets. In the September 1, 2014 filing, and subsequent consideration of the targets in the previous cycle, the EERMC stated:

> *The EERMC and the parties understand that the efficiency savings targets are intended to serve as guideposts as the utility develops its Three-Year EE Procurement Plan and more detailed annual EE Program plans. As the parties described in a joint brief filed with the Commission in Docket 4202 on April 1, 2011:[2] "It is important to note that the energy efficiency savings targets are just that, targets of what the EERMC assessment estimates is potentially available for cost-effective efficiency…*
>
> *...In summary, while the robust and detailed 3-Year Efficiency Procurement Plan and the related annual Efficiency Program Plans are subject to the cost-effectiveness standards of § 39-1-27.7(c) (5), the targets developed by the EERMC under R.I.G.L § 39-1-27.7.1(e)(4) and (f ) are not subject to the cost-effectiveness standard, because as high level estimates, the purpose of the targets is simply to guide the development of those plans. The 2010 legislation recognizes that the energy savings targets themselves do <u>not</u> constitute a plan, but rather the targets are just high-level estimates of the potentially available cost-effective efficiency,*

[2] The joint brief is available at: http://www.ripuc.org/eventsactions/docket/4202-EEMRC-JointRR(4-1-11).pdf

*whose function is to guide the development of actual Three-year LCP and annual efficiency plans."*

While the Consultant Team has devoted considerable effort and worked with many parties to gain confidence that the recommended targets are reasonable, attainable, and consistent with Rhode Island law, we need to re-iterate that the language highlighted above also applies to these proposed targets for 2018-2020.

Further, to support consideration of the implications of this clarification, we acknowledge that while the 2018-2020 electric and natural gas savings targets have been developed using the best information and data available at this time, the annual savings targets should be reviewed each year during the development of the Annual Plan. Following this review, the target should either be confirmed or revised in light of new information, as described in the proposed Least Cost Procurement Standards for 2018-2020 to be filed with these Targets (pending their adoption).[3] The parties participating in the Annual Plan development should agree that revisions to the annual energy savings targets should be based only on clearly documented changes in cost-effective resource availability.

We also note that there is agreement in principle among the Targets and Standards Subcommittee that have worked on this set of proposed Targets and the revisions to the Standards, that it may be time to permit increased flexibility for National Grid in the transfer of funds across programs and sectors. Such transfers would be permitted if they allow for savings to be secured that would not otherwise occur, while avoiding a substantial shift over time away from securing savings in any given customer class.

## The Standards

The proposed revisions to the Standards are included as Appendix A in this filing. They are the work in large part of the System Integration Rhode Island ("SIRI") group, which included National Grid, the EERMC Consultant Team, the Office of Energy Resources ("OER"), Acadia Center, with input from Synapse Energy Economics, consultant for the Division. These revisions have been presented for review and input to the Collaborative, and to the EERMC.

These proposed Standards, covering both Energy Efficiency and System Reliability (SRP), reflect the hard work of many parties, and the insight that has been gained over the last three years into the evolution of energy efficiency resource procurement, and the application of non-wires strategies, to provide an important new set of tools in planning the utility distribution system. Topics addressed in

[3] "The Utility shall include a preliminary budget for the Three-Year Plan covering the three-year period that identifies the projected costs, benefits, and initial energy saving targets of the portfolio for each year. The budget shall identify, at the portfolio level, the projected cost of efficiency resources in cents/ lifetime kWh or cents/lifetime MMBtu. The preliminary budget and initial energy saving targets may be updated, as necessary, in the Utility's Annual Energy Efficiency Plan." Section 1.3. B. iv. b.

these Standards are also very much under consideration in Docket #4600, and we recognize that progress in that Docket may inform the review of these proposed Standards by the Commission.

We believe the formal consideration of the Standards should accompany the consideration of proposed Targets and look forward to discussing the potential interactions between the Targets and the Standards as they undergo more formal review.

# II. Savings Targets

## Context and Industry Overview

The targets for the 2018-2020 Three Year planning cycle are based on very detailed analysis and research, grounded in years of program experience and performance, and on a working knowledge of the current state and potential of the existing market. Further, the industry's evolving markets, emerging trends and innovation were evaluated to support appropriate projections of achievable potential. The Consultant Team is confident that the proposed Targets appropriately balance the solid analysis of available information on current programs with the estimates of additional opportunities based on probable energy efficiency industry advancements that clearly indicate growing potential to supplement the base analysis. The following presents a few of the trends and dynamics we see in energy efficiency markets that are of increasing importance.

The business of securing cost-effective energy efficiency savings and transforming energy efficiency markets has always been in some measure, and now increasingly, dynamic. Just when we think we have it "figured out" customer perceptions change, new technologies emerge, and the markets evolve. Part of the challenge for LCP is not that we are "selling a product" but we are trying to figure out how to help customers "buy" products they should already find desirable, but which for a variety of reasons (called "market barriers") they do not select.

We want to emphasize that the last decade since the passage of the LCP Mandate in Rhode Island has had dramatic success:

- Rhode Island has become a national leader in both electric efficiency and natural gas efficiency savings.
- Loads for electricity have flattened and even declined in some years.
- One impact of this success is that there has been less need than anticipated for System Reliability Planning (SRP) as a "targeted" strategy for load-constrained areas.
- There is an increasing focus on SRP as part of managing the whole distribution system.
- On the other hand, new technologies that can provide significant cost and environmental benefits are emerging that may increase electric usage.

## *There are different markets and opportunities for efficiency.*

There is not a bright line dividing the types of opportunities for efficiency. However, different types of efficiency require different levels of customer investment and engagement and consequently different strategies for resource acquisition. One way to identify a critical dividing line between efficiency opportunities, measures and programs is the level and complexity of investment required to adopt the new product or technology. Consider, for instance, whether you can go to the store and "buy one off the shelf or showroom floor" for products regularly replaced *or* you need to have a building or system assessment, and make a very substantial investment for complex measures and installations with multiple barriers and high cost. Increasingly, the ongoing management of complex systems to secure performance efficiency from the whole system is a part of this more sophisticated approach to securing efficiency savings.

### *Products Regularly/Easily Replaced*

A great deal of the energy efficiency savings we have secured in Rhode Island, and throughout the country to date, have been in the category of new efficient products and appliances.

For instance, the rapid evolution of lighting from incandescent and old inefficient fluorescent technologies has brought us through compact fluorescent and far more efficient commercial fluorescent lighting, to LED lighting, which is moving very swiftly to become a versatile, affordable, and highly adaptable technology that yields even greater savings and other benefits. Costs are rapidly declining, and versatility and quality of the products is improving.

While this is an important and very positive evolution, it will have implications for the lighting savings that can be claimed through efficiency programs. We anticipate that utility program investment to support lighting efficiency, especially in the residential sector, will be reduced significantly in the near future and new efficient lighting will become by-in-large the norm in the marketplace. Although this will mean that efficiency programs may be able to predict and claim less savings, customers, markets, energy systems, utilities, and the environment will continue to realize enormous efficiency savings and benefits as these products become mainstream. Issues about who is a program "participant" and who is not will become irrelevant as all customers purchase the products and realize their benefits as part of normal market activity.

Some level of continued engagement with the markets by programs will be needed to ensure product quality, service for underserved market segments, and pressure for continued product innovation and evolution.

We need to emphasize again that this is success! In fact, when parts of the energy market are indeed "transformed" it is perhaps the biggest success of efficiency programs. This success has come about not by magic, but through deliberate strategies and program designs and investment by utilities. Successful programs typically contain the following elements:

- The incentives and education for consumers to believe that "this stuff works," saves money, and helps the environment, even though it might initially seem not obvious or different.
- Those same messages and investments are targeted to wholesalers and retailers to stock these new products and make room on shelves for them.
- "Upstream" programs that work directly with manufacturers, wholesalers, and distributors to make sure they carry these products and recognize their increased sales potential. Incentives are provided as a "buydown" for all products sold in the relevant area. These upstream efforts affect stocking practices, and accelerate acceptance of preferred products. Administrative hassles and expense for processing individual incentives are eliminated, removing a significant barrier for both buyers and suppliers.
- Direct install efforts, where lighting and other plug or screw-in measures are installed during energy audits, help increase market demand by increasing the volume of efficient product adoption and acceptance.
- New state and federal standards for efficiency that effectively make these new products the new "normal" products. Increased acceptance in the marketplace makes these efficiency standard updates politically possible.
- Increased visibility of efficiency. The creation of a "market" for efficiency more generally through the existence of utility programs has helped spur innovation and new, improved product development, encouraging R&D and new marketing approaches as well.

Though we talk about lighting in this example, most major household appliances and some commercial and industrial (C&I) products have gone, and will continue to go, through a very similar process of evolution to new levels of efficiency. On the residential side, these currently include televisions, heating and air conditioning units, refrigerators, and hot water heaters. In 2017, the list will include ECM pumps and pool pumps.

For C&I projects, the list includes:

- Lighting (TLEDs, screw in lamps + MR16, luminaires for stairways, 1x4 – 2x2 – 2x4 luminaires)
- Electric HVAC Equipment (unitary HVAC, heat pumps (water, air, ground) ductless mini split)
- ECM circulator pumps – (new in 2017)
- Electric and gas kitchen equipment (new in 2017)
- Gas Water heating equipment (Indirect, Storage, Tankless, Volume)

In each instance, traditional efficiency programs laid a foundation for an upstream program by discerning the opportunity for savings and promoting new technologies through education, incentives, and market support. New (mostly federal) efficiency standards have, over time, helped institutionalize these new savings levels. As a result the level of savings "claimed" by utility programs has appropriately diminished, but the level of benefit to customers, society, the economy and environment has continued to grow.

In general, financing strategies for many of these kinds of programs have not been as essential as direct utility incentives. This is in part because the costs—particularly the incremental costs—have been relatively small amounts of money, and the technologies themselves are on a declining cost curve as they improve in quality and as demand for them increases.

Financing strategies become much more important for the larger, more complex investments that represent the other category of efficiency opportunities (discussed in the next section) that may be involved with other energy and building quality and performance investments.

While we have become effective at calculating the costs and benefits of utility programs, we have—surprisingly—not been as effective at documenting and accounting for these greater benefits from transformed markets. It will be important to build on the experience with National Grid's codes and standards program[4] to define and specify the activities that can accelerate adoption and effective implementation of new codes and standards. This will require providing adequate attribution of benefits to utility efforts so we do not create a situation in which utilities are effectively "penalized for success" and no longer have funds to conduct the crucial efforts that support further opportunity identification and market transformation.

Over the past 8 years the federal government has been aggressive at setting new efficiency standards for a wide range of energy-consuming products. It appears that there continue to be enormous opportunities for savings from updates to existing standards and standards for new products. The Appliance Standards Awareness Project (ASAP) and the American Council for an Energy Efficient Economy (ACEEE) recently published a report entitled: *Next Generation Standards: How the National Energy Efficiency Standards Program Can Continue to Drive Energy, Economic, and Environmental Benefits*,[5] which explores the future savings potential for national efficiency standards. The report clearly documents significant amounts of added savings potential and includes specific recommendations to reach the potential.

These efficiency standards as they continue to go into effect and as new federal and state efficiency standards are issued can do four things:

- Provide enormous financial, comfort, economic, health, and environmental benefits.
- Increase and distribute the benefits of efficiency to all market players and customers.
- Reduce the level of investment in direct incentives and program activity needed in certain efficiency programs.
- Create new opportunities for investment in programs that accelerate adoption and early replacement, particularly for long-lived products.

[4] http://www.ripuc.org/eventsactions/docket/4654-NGrid-EEPP-2017(10-17-16).pdf pp. 25-27 of Attachment 2
[5] http://www.appliance-standards.org/sites/default/files/Next_Gen_Executive_Summary.pdf?utm_source=Issue+20&utm_campaign=Newsletter+Issue+20%2C+Octo+2016&utm_medium=email

***Long-lived Measures, Complex Installations, Multiple Barriers, (Sometimes) High Cost***

We offer that the line between easily replace products and more complex installations, while significant, is not precise or absolute.

Efficiency programs have, from their beginning, sought to address the market barriers to these high-investment, more complex opportunities for savings. This has been true in the residential markets (whole-house treatments including insulation, air sealing, and system replacements), the commercial/institutional sector (thermal, building shell, and heating/cooling system opportunities) and the industrial sector (industrial process opportunities). Much learning and significantly improved program designs and strategies have evolved over the years, including strategies that develop long-term partnerships among institutions, efficiency programs and the design, product development and installation communities. All these efforts have and should include a spectrum of savings opportunities that also include both "easy" product change outs, and more demanding installations.

Rhode Island has experimented with partnerships, financing strategies, and improved understandings of the many interactive dynamics that accompany these projects, i.e. the relationship between thermal integrity and cooling/heating system sizing, or the need for reliability and continuous operation in industrial processes and complex buildings or campuses.

With Rhode Island's creation of the Rhode Island Infrastructure Bank (RIIB) a new step has been taken toward facilitating the level of savings in this more difficult sector. The Consultant Team believes that there are several other dynamics at work that increase the potential for growth in this opportunity area for savings.

- Customers are increasingly recognizing that investment in their facilities can have a significant impact on the level and nature of their energy needs and costs. The RI Public Energy Partnership ("RIPEP") program demonstrated the openness of the Municipal sector to thinking this way about its facilities and helped create the significant response to the first round of RIIB's Efficient Building Fund offerings.
- The extreme example of this emerging trend is the evolution of the concept of "zero net energy" facilities that are very efficient, have high thermal integrity, operate "intelligently" and generate some of their own energy. A zero net energy working group is currently exploring the cost-effectiveness of this approach as a broader program opportunity.
- The dynamics of emerging on-site generation (solar, CHP), the potential for storage (passive and active), and even energy exchange systems, as well as active load management begin to create a new sense of what a "modern" building can be like. This creates a dynamic that could help overcome some of the resistance to "efficiency-only" investments.
- The opportunities for integrated approaches to investment may be enhanced by financing strategies that can include renewable energy and load management as well as traditionally-defined efficiency. Utility programs will need to partner with customers and other service providers in new ways. Grid's new SolarWise program may be an example of such a strategy.

- The development of long-term partnerships with industrial and large institutional and commercial customers via the Strategic Energy Management Program has demonstrated that efficiency efforts evolve into ongoing efforts to understand and improve the performance of buildings, complexes and campuses.

Growth in this sector of Rhode Island's energy efficiency economy has enormous potential. We need to be clear that the barriers to be overcome are significant and often somewhat different from the barriers to accepting new efficient products. They include:

- Addressing complexity and interactive effects that can be overwhelming for customers, and inadequately addressed by some designers and vendors.
- Addressing and making intelligent use of significantly increased data through operational and system-related "management and timing" strategies that actually use the data, often in real time, to improve building efficiency and performance.
- Coordinated working relationships with a new range of vendors.
- Increased importance of load management to derive multiple benefits in addition to managing system peaks.
- Increased importance of relatively stable, and non-punitive rate designs or other pricing mechanisms that send the right signals to customers, increase predictability of benefits, and reward utilities for continuing innovation in Demand Response and Load Management.
- Support the development of services and capabilities that consider all energy sources and strategies on a consistent basis.

Given these developments, challenges and opportunities, it is clear some promising developments are on the horizon, but the work of securing these efficiency resources requires innovative program design, and work with many partners. It is difficult to quantify the specific impact they all will have directly, or indirectly, on targets for 2018-2020, but on the other hand, the potential is significant, and needs to be acknowledged. Examples of the opportunities and questions we will face in the next Three Year planning and implementation cycles to help unlock this potential include:

- How can we ensure that utilities and financing entities like RIIB and new market players are working at a high level of coordination, not at cross-purposes?
- How can we get at very-difficult products like "rooftop HVAC units" where there is the potential for significant potential savings, but the technologies need improvement, the costs are high, replacements difficult, both electricity and combustion fuels are involved, and the other market barriers (stocking levels, nature of replacement timing) are problematic?
- How can we help the customer- and market-focused skills developed by National Grid and its vendors keep expanding to cover all fuels and the intelligent incorporation of customer-sited generation and storage?

- How can we select and promote new data acquisition and usage so that it will help solve real problems for customers and the utility?
    - What are the costs and benefits of AMI and could AMI (in some version) support better:
        - Diagnostics,
        - Real-time management,
        - Pay for Performance strategies,
        - Demand savings for customers and the utility,
        - Better integration of customer and grid-side resources?
- How will electrification in appropriate settings be incentivized and integrated into the system in ways that maximize customer, societal, and system benefits?
- Can we actually create new market-based partnerships for comprehensive treatment that use financing, utility incentives, and new market players?
- Can we create a new vision of "Smart Buildings" that will change the culture of investment?
- How can we do this in a way that maximizes climate change benefits for Rhode Island as these issues receive increased public, regulatory, and economic attention.

## Summary of Electric Targets and Development Process

This section presents the Consultant Team's process to estimate the cost-effective efficiency potential that National Grid could achieve through ratepayer-funded efficiency programs in Rhode Island. This assessment provides the basis for setting savings targets for the state's next Three Year Plan, and is therefore focused on the years 2018 through 2020. As an exercise strictly aimed at quantifying savings potential, this assessment does not offer any program design or cost detail that would be required to achieve that potential. On the other hand, the assessment does include a rough assessment of potential costs and benefits sufficient to have confidence that the initiatives would be cost-effective.

Our estimate of gas and electric potential at the portfolio level was developed by assessing the savings potential for each of the current core programs, and associated measures and services, offered to Rhode Island customers, which we reference as the Base Potential. We also reviewed additional savings potential impacts outside of the current core program offerings that will result from policy and technology changes, which we reference as Evolving Potential. Data considered included:

- Completed EM&V studies for Rhode Island and neighboring states
- Recent and planned program performance in Rhode Island and neighboring states
- National Grid's savings forecasts for initiatives
- Other relevant information from other jurisdictions
- Assessment of evolving policies, technologies and services

### Stakeholder Input

The Consultant Team has worked closely with a Targets and Standards Sub-Committee in the development of proposed Targets as it did for the 2015-2017 target setting process. In addition, National Grid staff was actively engaged in the analytical process, providing valuable input, feedback and perspective, drawing from knowledge and expertise of in-house staff as well as key vendors that are supporting program delivery. There were stakeholder meetings with a number of interested parties, including TEC-RI and the Environment Council of Rhode Island in the spring and early summer of 2016. Finally, the Collaborative has had these Targets (and the Standards) as an agenda item for multiple meetings in 2016.

## Overview of Methodology and Results

The Achievable Potential, presented using a consistent metric of "annual savings as a percent of load" for the entire state, was derived from the following components:

- The *Base Potential Estimate* is the estimate of achievable potential identified through a bottom up analysis of potential savings from current efficiency programs offered in Rhode Island.
- *Evolving Potential* refers to those factors identified by the Consultant Team as having possibly significant impacts on savings potential, but are not currently being offered, or fully deployed, through Rhode Island's energy efficiency programs. These are specific items related to the evolving markets, emerging trends, and innovation that will impact potential, but that are more difficult to quantify than the Base Potential.
- The *Achievable Potential Estimate* represents the Base Potential estimate plus a reasonable high level quantification of Evolving Potential adjustments.

## Base Potential Study Estimates

In previous planning cycles, the Consultant Team relied on the 2010 KEMA Opportunity Report ("the KEMA report"), supplemented with additional analysis, to determine the potential for cost-effective electric energy efficiency savings that are cheaper than the cost of supply. Although the KEMA report identified energy efficiency potential in Rhode Island through 2020, it was clear at the start of the 2018-2020 planning cycle that some of the assumptions made in the KEMA report no longer represented an accurate assessment of current and changing market conditions. Significantly, for instance, the report did not consider the drastic reduction in claimable potential residential lightings savings due to changes in codes and standards and market transformation.

Rather than try to account for and correct the inaccuracies in the KEMA forecast data, the Consultant Team, with input from National Grid, used an alternative method to develop a base level of savings potential for 2018-2020. This method included using a bottom-up approach to develop estimates of the savings potential for each of the current core residential and C&I programs offered to Rhode Island customers. For many of the programs, the bottom-up analysis to derive annual savings projections was done at the measure level. This entailed developing annual projections of unit

numbers and, for some measures, annual Net-to-Gross (NTG) estimates. However, in some instances, granular measure level data was unavailable. In other instances, the measures offered in certain programs were unlikely to change significantly from currently levels and were not analyzed individually. Data considered included actual program, end use, and measure level savings through 2015; planned savings for 2016 and 2017; as well as planning information gleaned from other jurisdictions. A similar approach was used to estimate the savings potential for both electric and natural gas programs. Estimated potential from each program was rolled up to arrive at portfolio level gas and electric savings estimates.

Appendix B provides tables with historical savings for 2009-2015, planned savings for 2016-2017 and base level, "business as usual" savings projections for 2018-2020 by each program for both electric and gas. To supplement these tables, subsets of the programs impacting portfolio target estimates are shown as trend charts with supporting descriptions and data. The electric program charts shown include: Small Business Direct Install, Large Commercial New Construction, Large Commercial Retrofit, Energy Star Lighting, EnergyWise Single Family, and Energy Star HVAC. These programs account for approximately 80% of the electric portfolio savings. The gas program charts shown include: Small Business Direct Install, Large C&I New Construction, Large C&I Retrofit, Income-Eligible Multifamily. These programs account for approximately 75% of the gas portfolio savings. Descriptions of the key factors impacting program savings trends and changes in projected savings are provided under each chart. Example measure level analysis for the Energy Star Lighting and Electric HVAC programs is provided to illustrate assumptions made for the purposes of the savings projections. Similar detailed measure-level analysis was conducted for many of the programs where data was available. C&I electric portfolio assumptions made by measure type are also provided.

Arriving at a base potential estimate was an intensive and iterative process involving many discussions and data exchanges between the Consultant Team and National Grid. For the C&I programs, many different assumptions were discussed over the course of the planning process with no one assumption having a disproportionally large impact on potential targets. Examples of some key topics of discussion included basing future projections on actual 2015 results vs planned 2015 savings levels, as well as opportunities from various HVAC and industrial process measures and markets in the retrofit and new construction programs. For the residential and income eligible programs, the Consultant Team and National Grid had several discussions to arrive at consensus unit numbers and NTG factors for retail lighting. Other examples of residential iterative changes include updating non-retail lighting and non-lighting savings estimates to reflect 2017 program activity and planning estimates. The parties also agreed to look at changes to the residential behavioral program model as part of the evolving potential.

The 2018-2020 assessment of base potential was a rigorous and nuanced process. It relied not only on past and planned data, but also on our most current understanding of the market and the professional judgement and experience of vendors in Rhode Island and other experts in the energy efficiency field. Ultimately, it was a collaborative effort between the Consultant Team and National

Grid. At the conclusion of the base potential analysis, there were still some assumptions on which the Consultant Team and National Grid differed. As a result, the base potential estimates also differed, though not significantly. To arrive at consensus, the base potential numbers listed in Tables 1 and 2 represent the average of the Consultant Team and National Grid's final base potential estimates.

**Table 1 | Consultant Team Core Program Electric Base Potential Estimate**

| **Potential Estimate (% of 2015 retail sales/Units)** | | | | |
|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **Total** |
| *Base Potential Estimate* | | | | |
| Residential | 1.12%/ 84,065 MWh | 0.88%/ 65,999 MWh | 0.72%/ 53,929 MWh | 0.91%/ 203,993 MWh |
| Income Eligible | 0.09%/ 6,841 MWh | 0.09%/ 6,484 MWh | 0.08%/ 6,059 MWh | 0.09%/ 19,384 MWh |
| C&I | 1.44%/ 107,783 MWh | 1.48%/ 110,718 MWh | 1.51%/ 112,905 MWh | 1.48% 331,406 MWh |
| **Portfolio** | **2.65%/ 198,689 MWh** | **2.45%/ 183,201 MWh** | **2.31%/ 172,893 MWh** | **2.47%/ 554,783 MWh** |

**Table 2 | Consultant Team Core Program Gas Base Potential Estimate**

| **Potential Estimate (% of 2015 retail sales/Units)** | | | | |
|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **Total** |
| *Base Potential Estimate* | | | | |
| Residential | 0.34%/ 139,960 MMBtu | 0.36%/ 145,509 MMBtu | 0.37%/ 151,475 MMBtu | 0.36%/ 436,943 MMBtu |
| Income Eligible | 0.07% 27,547 MMBtu | 0.07%/ 28,433 MMBtu | 0.07%/ 29,322 MMBtu | 0.07%/ 85,301 MMBtu |
| C&I | 0.53%/ 215,280 MMBtu | 0.53%/ 216,365 MMBtu | 0.53%/ 215,705 MMBtu | 0.53%/ 647,351 MMBtu |
| **Portfolio** | **0.93%/ 382,787 MMBtu** | **0.95%/ 390,307 MMBtu** | **0.97% 396,502 MMBtu** | **0.95%/ 1,169,595 MMBtu** |

## Evolving Potential

### Introduction

As detailed in the introductory sections, the energy efficiency industry is undergoing significant changes. Market transformation, codes and standards developments, technological advancement,

and implementation innovation represent issues that will absolutely impact the current base savings estimates that focused heavily on current conditions and highly probable market advancements. However, while the base potential had extensive data and clearly foreseeable advancements on the near horizon to reference, the evolving potential the Consultant Team identified is less well defined and more difficult to quantify. However, while identifying precise quantification is not easy, we feel that qualitatively there is high confidence that the impacts on achievable potential will be appreciable.

The effort to capture the impact of evolving potential was organized into three general categories: Codes & Standards; LCP Standards; and New Technologies and Program Enhancements. Of these, only the "New Technology" item included efforts to effectively quantify potential at this time. However, the inclusion of the other two items, even though listed as 0% impact, is important given the expected process of reviewing Targets as part of each Plan development. The Consultant Team believes that the Codes and Standards and LCP Standards will have the potential to appreciably impact achievable potential estimates in any of the years from 2018-2020. So even though an estimate of impact is premature, the intent is to assure that these are items that are clearly covered in future annual planning cycles to evaluate potential impact.

### Codes and Standards

As indicated in the discussion of federal energy efficiency standards for energy-using products on page 9 of this memorandum, the setting of new energy efficiency standards is a powerful force for effecting market transformation to more energy efficient products. As discussed there, the Obama Administration has been aggressive in developing and instituting these standards. This has had the dramatic effect of improving the baseline efficiency of new products as they enter the market. This, in turn, has the effect of reducing the amount of "efficiency potential" that needs to be targeted through efficiency programs, while providing greatly expanded access to efficiency throughout the economy, and, in effect, increasing participation to all customers for those products. We have suggested that federal lighting standards are having precisely this effect on the "potential" for lighting savings, having the effect of creating declining program-related savings for the 2018-20 planning period. We referenced that a recent study produced by ASAP and ACEEE indicated a significant potential to secure even more savings through promulgating new product efficiency standards remains.

Early indications are that the new Trump Administration may be far less dedicated to promulgating efficiency standards, and might even support roll-back of standards just coming into effect. Such action would have the rather perverse effect of increasing the level of efficiency that might need to be secured by efficiency programs, since it would not be institutionalized and the markets would not be transformed by the adoption of standards. It might be appropriate for Rhode Island to increase its program offerings if standards are not in place to secure the savings effectively. We have not even attempted to quantify the impact of changes to federal policy relative to product efficiency

standards, but we do want to identify that the impact could be significant. It will be important to review developments on this front as the Three Year Plan and each Annual Plan processes proceed.

In a similar manner, potentially decreased federal support for updates to residential and commercial building codes could impact savings, though in these areas of regulation states have much greater opportunity for initiative.

### Proposed Modifications to LCP Standards.

The proposed changes to the LCP Standards included in this filing could have an impact on determining the cost-effectiveness of certain measures and programs. The shift to a "Rhode Island Test" that might include more value for carbon emissions avoided, and a value for economic benefits from energy efficiency programs could, for instance—by recognizing a wider range of benefits—both increase claimed benefits and improve the cost-effectiveness of certain savings opportunities. This could result in more measures (especially "deeper saving" measures), new strategies, and new programs becoming cost-effective. This effect would, in turn, potentially change the scope of savings opportunities.

### New Technologies & Program Enhancements

Forecasting energy savings from new technologies and program approaches is a challenging task. It requires significant assumptions to be made about market adoption, participant levels as well as, in some cases applicable regulatory or legislative action.

However, given the fast pace of innovation and new delivery methodologies that are already helping to drive market adoption today, it would be imprudent to assume that the potential savings attribution from both new technologies and program approaches is inconsequential to the overall portfolio savings potential given these uncertainties.

To support these general indications, the following provides an extensive list of specific technologies and/or services that could result in measureable attributable savings on top of the base potential. The first set is a "qualitative" list of characterization and current market status of items that are not easily quantifiable yet.

### *New Technologies and Program Enhancements (non-quantified)*

- **Advanced RTU controls:**[6] A rooftop unit (RTU) is an air handler (a devise used to regulate and circulate air as part of a building's HVAC system) designed for outdoor use, typically on roofs. RTUs are estimated to be used in 46% of all commercial buildings and serve about 69%[7] of the cooled floor space in U.S. commercial buildings. Adding "controls" to existing rooftop units (retrofit "RF") optimizes the performance of the RTU by providing remote energy monitoring

[6] Oct 2015: Northeast/Mid-Atlantic Commercial Packaged HVAC ("Rooftop Unit") Market Transformation Strategy Report

[7] 2013 PNNL study of 66 RTUs -the advanced controllers reduced normalized annual RTU energy consumption between 22% and 90%, with the average being 57% for all RTUs.

and control as well as variable speed drives, demand-controlled ventilation, and other features.

- **Smart "electro chromatic" Glass:** Electrochromic glass, also known as smart glass or electronically switchable glass, is an innovative and modern building glass that can be used to create partitions, windows or skylights.
- **Energy Star data servers:** EPA Energy Star has developed a 1-to-100 energy performance rating for data centers. This focuses on a list of recommended efficiency actions including technologies, cooling, air management, IT equipment, power and other environmental conditions.
- **UPS systems:** Uninterruptible Power Supply - and other server technology uses power more energy-efficiently.

### *Additional items focused on program enhancements beyond Base potential assumptions*

The following are all items that were to a degree and scale factored into the base potential analysis. They are included in the section also, on the potential for expansion of their application beyond the base assumptions.

**Boiler reinstallations –** Savings attributable to boiler installations was reduced by one third due to incorrect installation during 2015/16. If corrected savings could be retrieved through 2018, this could provide gas savings potential in the residential sector.

**LED Street Lighting–** Projected savings for LED street lighting in 2017, in addition to the state and municipal conversions expected to be completed through 2016, represent an estimate of largely transforming all streetlights in the state. This assumption leaves little potential for 2018-2020. However, if delays or other market conditions cause a delay in these projections, opportunities will spill over to 2018 and possibly beyond.

**Upstream Programs–** Upstream program delivery has the potential to deliver exponential growth in adoption of some measures and provide significantly increased gas and electric savings. National Grid already effectively uses this delivery model for a wide range of residential and C&I measures, and that is effectively captured in the base potential. However, more products have the potential to move upstream, which could expand even further the savings potential from this approach.

### *New Technologies and Program Enhancements (quantified)*

The following items represent measures where reasonable calculations allow for estimates of potential MWh and MMBtu savings.

- **Laminar Flow Restrictor Devices—**This measure does not draw air from the surrounding room into the water stream and produces a non-aerated clear stream of water, inhibiting bacterial growth and transmission. While drawing air from the room around the faucet isn't a problem in residential and commercial facilities, it can be a concern in hospitals, urgent care, medical labs and other health-care related facilities. Room air can contain harmful bacteria

and when mixed with water it could potentially contaminant drinking water. Reduced flow rates can save money on water and energy costs.

- **Wi-Fi Thermostats—** While this measure is another that is to a degree and scale factored into the Base analysis, additional potential exists for wider application. In the residential sector, there is potential to increase Wi-Fi sales in future for both single-family and multi-family applications, providing gas savings.
- **Optimized ECM Pump controls—**ECM (Electronically Commutated Motor) technology helps to make circulators used for hydronic and radiant heating systems more energy efficient. The intelligent speed control these circulators provide can drastically reduce energy usage when compared to the conventional, static speed technology.
- **Indoor Agriculture—**RI has experienced exponential growth over last 6 years (~375%) of registered medical marijuana users. In RI registered users are allowed to grow a maximum of 12 plants/person. With each plant using an average of 100-250W minimum per plant (actual, not equivalent) and 1,746 light hours/growth cycle this equates with a very conservative approximation of 200kWh/plant/growth cycle. Bottom line, energy use by indoor agriculture such as cannabis production is intense and dedicated: 38% to lighting 21% to air conditioning (largely to handle waste heat from lighting), 11% to space heating, water movement, carbon dioxide injection and drying. Agricultural energy savings will not necessarily stem from existing LED lighting technology due to the required actual wattage vs. equivalent. Load reduction will require a comprehensive approach to managing the existing market and future growth.
- **Financing—**The EERMC directed its Financing Expert (Dunsky Energy Consultants) to develop an analysis and memo documenting the potential impact of financing on the 2018-2020 targets. The resulting product was covered in the determination of base potential through discussions with National Grid. National Grid staff represented that a significant portion of the estimated electric savings in the Dunsky report was part of their base assumptions. There remained, however, some additional potential, so those additional electric savings estimates are included as evolving potential. A proportional amount of additional gas saving was also included.
- **Behavior—**While the market for behavioral programs is dominated by a single vendor with a distinct approach, multiple jurisdictions are piloting and implementing new models nationally. The potential for a supplemental or parallel approach to the current behavioral program in Rhode Island will likely be an option at some point in the 2018-2020 timeframe.
- **Heat Pump Dryers (vented hybrid, ventless hybrid and ventless full heat pump)** are an environmentally friendly, energy efficient (typically reducing drying temperatures by 25% and overall energy consumption by 40%), cost effective and given their “ventless” design suitable for every home.

### *Potential impact of new technology approaches and program approaches.*

The following calculations are examples of specific technologies that could create a positive impact on saving assumptions based on an extremely conservative consideration of market influences.

**Table 3 | Evolving Potential Technology/Programs Potential Estimates**

| Technology/Program Expansion | Savings (Units/% of 2015 Sales) | | |
|---|---|---|---|
| | **2018** | **2019** | **2020** |
| **Electric** | | | |
| ECM Pump technology (>3HP) new opportunity | 1,500 MWh/ 0.02% | 1,500 MWh/ 0.02% | 1,500 MWh/ 0.02% |
| ECM Pump (<3HP) upstream expansion | 255 MWh/ >0.00% | 255 MWh/ >0.00% | 255 MWh/ >0.00% |
| HP Dryers new opportunity | 99 MWh/ >0.00% | 99 MWh/ >0.00% | 99 MWh/ >0.00% |
| Indoor Agriculture existing RF opportunity | 3,560 MWh/ 0.05% | 3,589 MWh/ 0.05% | 3,618 MWh/ 0.05% |
| Behavior (residential) program expansion | 8,552 MWh/ 0.11% | 10,962 MWh/ 0.15% | 13,396 MWh/ 0.18% |
| Financing | 64 MWh/ >0.00% | 2,694 MWh/ 0.04% | 6,134 MWh/ 0.08% |
| **Electric Total** | **14,029 MWh/ 0.19%** | **19,100 MWh/ 0.22%** | **25,002 MWh/ 0.25%** |
| **Gas** | | | |
| Laminare Flow Restricter Devise new technology | 36,000 MMBtu/ 0.09% | 36,000 MMBtu/ 0.09% | 40,000 MMBtu/ 0.10% |
| Wifi thermostats program expansion | 3,417 MMBtu/ 0.01% | 3,417 MMBtu/ 0.01% | 3,417 MMBtu/ 0.01% |
| Financing | 108 MMBtu/ >0.00% | 4,184 MMBtu/ 0.01% | 9.269 MMBtu/ 0.02% |
| **Gas Total** | **39,525 MMBtu/ 0.10%** | **43,601 MMBtu/ 0.11%** | **52,586 MMBtu/ 0.13%** |

## Conclusion and Recommended Efficiency Savings Targets

As discussed above, the Consultant Team engaged in an extensive process to identify the achievable potential of electric and natural gas energy efficiency savings in Rhode Island for the 2018-2020 period. The process was coordinated closely with the Targets and Standards Subcommittee. Additionally, the input of key stakeholders including the Collaborative and other interest groups helped steer the analysis and perspective of the undertaking.

While there is some level of uncertainty in forecasting the future, the Consultant Team has high confidence that the process undertaken effectively identifies an achievable potential. Tables 4 and 5

provide the summary of the base potential and the evolving potential that informed our estimate of achievable potential.

**Table 4 | Consultant Team Revised Electric Potential Estimate**

| **Potential Estimate (% of 2015 retail sales/Units)** | | | | |
|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **Total** |
| *Base Potential Estimate* | | | | |
| Residential | 1.12%/ 84,065 MWh | 0.88%/ 65,999 MWh | 0.72%/ 53,929 MWh | 0.91%/ 203,993 MWh |
| Income Eligible | 0.09%/ 6,841 MWh | 0.09%/ 6,484 MWh | 0.08%/ 6,059 MWh | 0.09%/ 19,384 MWh |
| C&I | 1.44%/ 107,783 MWh | 1.48%/ 110,718 MWh | 1.51%/ 112,905 MWh | 1.48% 331,406 MWh |
| **Portfolio** | **2.65%/ 198,689 MWh** | **2.45%/ 183,201 MWh** | **2.31%/ 172,893 MWh** | **2.47%/ 554,783 Mwh** |
| *Evolving Potential* | | | | |
| Codes & Standards | - | - | - | - |
| LCP Standards Modifications | - | - | - | - |
| New Technologies/ Enhancements | 0.19%/ 14,029 MWh | 0.22%/ 19,100 MWh | 0.25%/ 25,002 MWh | 0.232% 58,131 MWh |
| *Potential = Base + Evolving* | | | | |
| **Total** | **2.84%/ 212,718 MWh** | **2.67%/ 202,301 MWh** | **2.56%/ 197,895 MWh** | **2.69%/ 612,914 MWh** |

**Notes:** Totals may not equal the sum of their respective pieces due to rounding.
2015 electric sales equaled 7,487,623 MWh.

**Table 5 | Consultant Team Revised Gas Potential Estimate**

| Potential Estimate (% of 2015 retail sales/Units) | | | | |
|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **Total** |
| *Base Potential Estimate* | | | | |
| Residential | 0.34%/ 139,960 MMBtu | 0.36% 145,509 MMBtu | 0.37%/ 145,509 MMBtu | 0.36%/ 436,943 MMBtu |
| Income Eligible | 0.07% 27,547 MMBtu | 0.07%/ 28,433 MMBtu | 0.07%/ 29,322 MMBtu | 0.07%/ 85,301 MMBtu |
| C&I | 0.53%/ 215,280 MMBtu | 0.53%/ 216,365 MMBtu | 0.53%/ 215,705 MMBtu | 0.53%/ 647,351 MMBtu |
| **Portfolio** | **0.93%/ 382,787 MMBtu** | **0.95%/ 390,307 MMBtu** | **0.97% 396,502 MMBtu** | **0.95%/ 1,169,595 MMBtu** |
| *Evolving Potential* | | | | |
| Codes & Standards | - | - | - | - |
| LCP Standards Modifications | - | - | - | - |
| New Technologies/ Enhancements | 0.1%/ 39,525 MMBtu | 0.11%/ 43,601 MMBtu | 0.13% 52,586 MMBtu | 0.11% 135,712 MMBtu |
| *Potential = Base + Evolving* | | | | |
| **Total** | **1.03%/ 422,312 MMBtu** | **1.06%/ 433,908 MMBtu** | **1.10%/ 449,088 MMBtu** | **1.06%/ 1,305,308 MMBtu** |

**Notes:** Totals may not equal the sum of their respective pieces due to rounding.
2015 gas sales equaled 40,951,320 MMBtu.

Once the range of achievable potential savings from 2018-2020 had been established through intensive analysis, selecting the final proposed targets within that range moved to discussions among the Savings Targets Sub-committee. Based on those discussions, the C- Team recommends the following electric and natural gas savings targets that properly reflect the "prudent and reliable" approach identified as an important aspect of Least Cost Procurement, which will serve as effective guideposts to support upcoming Three Year Planning, as well as the ensuing Annual Plans**:**

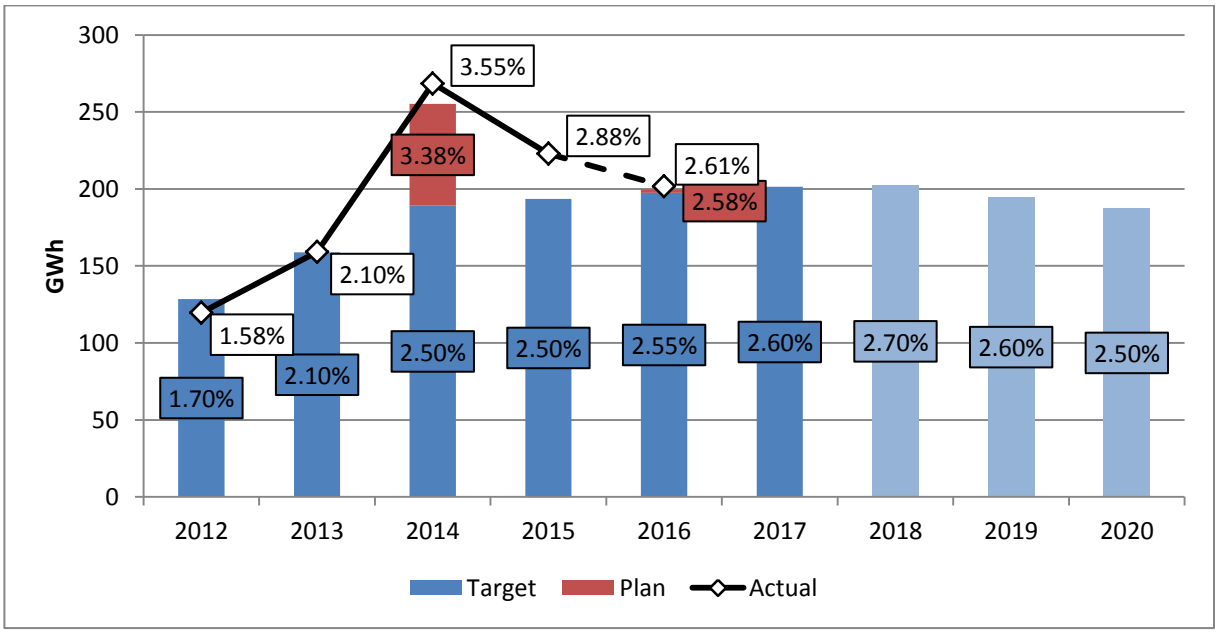
**Table 6 | Proposed 2018-2020 Savings Targets**

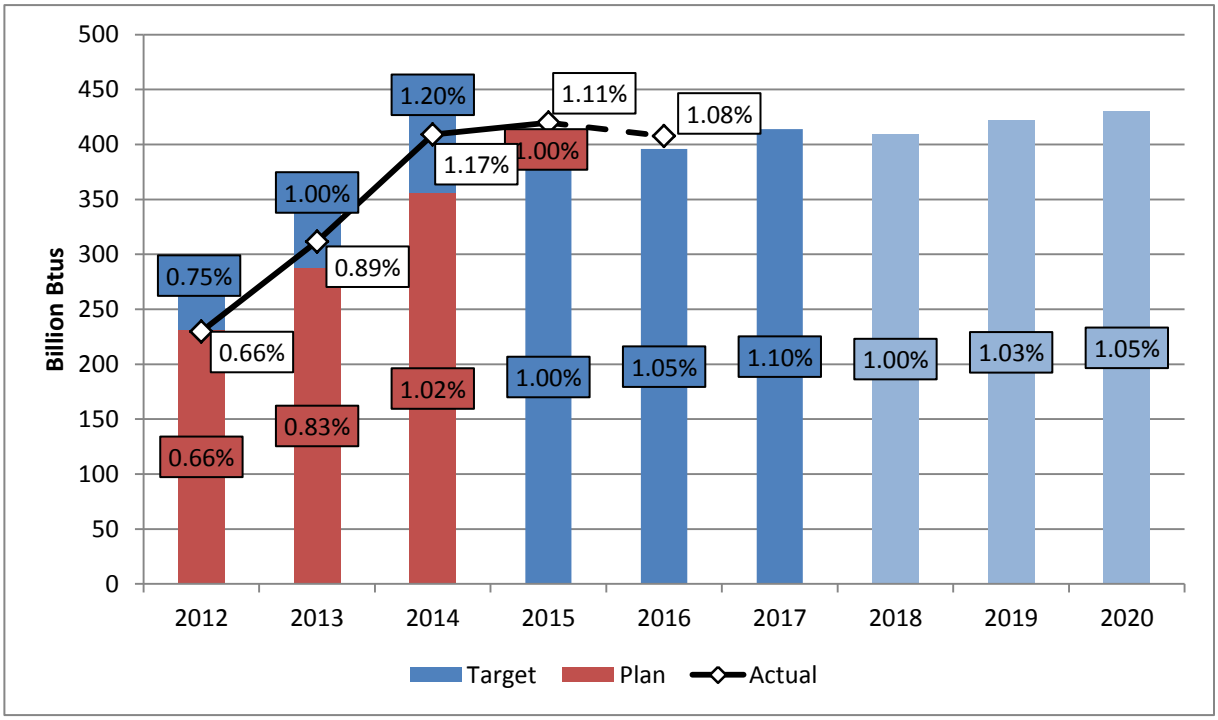
| Targets | 2018 | 2019 | 2020 | 2018-2020 |
|---|---|---|---|---|
| **Electric (MWh)** | **202,166** | **194,678** | **187,191** | **584,035** |
| ***% of 2015 Sales*** | **2.70%** | **2.60%** | **2.50%** | **2.60%** |
| **Natural Gas (MMBtu)** | **409,513** | **421,799** | **429,989** | **1,261,301** |
| ***% of 2015 Sales*** | **1.00%** | **1.03%** | **1.05%** | **1.03%** |

The electric savings targets, at the portfolio level, represent a slight downward trajectory year over year. This is largely due to the drop-off in residential and income eligible lighting savings previously discussed. Although it is possible that new technologies and opportunities may ultimately replace some of the loss of lighting savings, there is simply too much uncertainty and speculation at the present time to assume electric savings levels can remain at current levels through the 2018-2020 period.

Unlike the large impact of lighting on the electric portfolio, there was no single change in natural gas technologies or markets that resulted in a significant change in the trajectory of the savings targets in 2018-2020 compared to previous years. We note that although the savings as a percent of sales are lower than planned for 2017, the reference load forecast for natural gas has increased from the reference load used to set the 2015-2017 targets.

For context, the following two charts show the historical tracking of targets, associated annual plans and actual results.






## III. Proposed Amendments to Least Cost Procurement Standards

As described in the Introduction, the proposed revisions to both the EE Standards and the SRP Standards included in Appendix A reflect a high level of Collaborative and "key partner" input and shared effort. The guidance for how to conduct the energy efficiency planning and procurement process established by the Least Cost Procurement Standards become increasingly important as we move into a new era of customer empowerment and interactive "distributed" resources.

In order to have clear guidance for all participants, a broader range of "costs and benefits" are proposed to be included in our EE and SRP decision-making processes. This is part of the reason why the EERMC has recommended linking the Targets recommendations and the "Standards Review" processes in this planning cycle.

It may well be that new benefits proposed for consideration in Rhode Island's cost-effectiveness screening process make some measures and programs that are now marginally cost-effective, more solidly cost-effective.

### Summary of Revisions to EE Standard

The EE Standards were reformatted to follow the layout of the SRP standards and to provide more clarity. The standards now contain an introduction, definitions, and then the requirements of the three-year and annual plans.

The TRC Test was modified to include additional benefits such as economic development and potentially environmental externalities and is redefined as the Rhode Island ("RI") Test.

### Detailed List of Changes

- Introduction Section - Added this section to reference statute and introduce purpose of standards.
- Definitions Section - This section was added to provide more clarity and to follow the layout of the revised SRP Standards. Most of this section is made up of items from the existing 2014 standards, simply grouped together as a definition (ex. innovation, comprehensiveness, equity).
    - Energy Efficiency:
        - Made a distinction between annual and 3-year plans. EE Program Plan now referred to as Annual Plan and EE Procurement Plan not referred to as Three Year Plan.
        - Definition of EE now includes "strategic and beneficial management of the time of energy use within a defined system. A system may be a residence, a place of business, a public accommodation, or an energy production, delivery, and end-use consumption network."
        - Clarifies that EE plans should be designed where possible to complement the objectives of RI's clean energy policies and be coordinated with other energy programs.
    - Cost-effectiveness
        - Replaces TRC Test with a Rhode Island Benefit Cost Test ("RI Test") to better reflect the policy objectives of the state with regard to energy, its costs, benefits, and environmental and societal impacts.
        - Similar to the original standards, the Utility, after consultation with the Council, will propose the specific benefits, costs, and other factors to use in the RI Test in its Three Year and Annual Plans, but they now should include economic development impacts.
        - The test may now also include the value of greenhouse gas reduction not embedded in any of the above. The test may also include the costs and benefits of other emissions and their generation or reduction through Least Cost Procurement.
    - Prudency and reliability were broken into two separate definitions. The items within those two definitions were taken from the original standards in the program plan description.
    - Added environmental responsibility under prudent.
- Program description section
    - Added in load management with demand responses, and integration with non-wires alternatives (NWAs).

## Summary of Revisions to SRP Standard

The SRP Standards were originally developed to focus specifically on strategic use NWAs to defer or avoid the need for load-growth related grid upgrades. National Grid has been consistently following the SRP Standards as part of the distribution system planning process, but only the Tiverton/Little Compton DemandLink pilot has resulted. Many stakeholders view the Tiverton/Little Compton pilot as successful and compelling and would like to see additional NWA projects in RI.

The objective of the current effort to update the SRP Standards is to capture more potential uses of NWAs, including postponing or avoiding more expensive infrastructure projects, reducing the cost of grid improvements, and proactively deploying NWAs to avoid potential future grid problems.

### Summary Highlights

- Expands on introductory language to contextualize SRP within the LCP, grid planning, and state energy policy context.
- Adds new Definitions Section to clarify existing definitions for NWA, prudency, and reliability, and adds new definitions for SRP, electric distribution system needs, environmental responsibility, and comparison of costs and benefits.
- Proposes new framework for comparing the costs and benefits of wires and NWA.
- Offers new flexibility for NWA screening criteria, including partial NWA and NWA in highly utilized grid areas.
- Provides additional detail regarding a Three Year SRP Plan and content of Annual Reports.
- Adds new language (borrowed from EE Standards) to allow the utility to propose an SRP performance incentive.

### Detailed List of Changes

- Introduction Section
    - References purpose of SRP within the context of the LCP statute.
    - Clarifies that these guidelines for SRP seek to “enable the deployment of NWA to achieve state policy goals, optimize grid performance, enhance reliability and resiliency, and encourage optimal investment by the utility.”
    - Clarifies that SRP should be designed where possible to complement the objectives of RI’s clean energy programs and be coordinated with other energy processes.
- Definitions Section
    - Defines SRP as “an ongoing Company practice to maximize the prudent, reliable and environmentally responsible use of non-wires alternatives (NWA) to meet electric distribution system needs and optimize grid performance, subject to a system whereby wires solutions and NWA solutions can be fairly compared for both benefits and costs”.
    - Divides NWA into customer-side, grid-side, and combinations of both.

  - Adds a definition for different types of "electric distribution system needs" that SRP is intended to address.
  - Draws largely on language from previous Standards to define "optimization of grid performance", "prudency", and "reliability".
  - Adds a definition of "environmentally responsible".
  - Replaces TRC test with a new "comparison of benefits and costs" including a calculation of (1) NPV of project revenue requirement; (2) a calculation of the deferral value; and (3) CBA aligned with new proposed cost-effectiveness standards for EE.
- Assessment of Applicability of NWA
  - Adjusts NWA screening criteria by: (1) providing flexibility with the $1 million cost floor; (2) eliminating 20% relevant peak load requirement; (3) reducing start of wires project from 36 months to 30 months; and (4) adding flexibility for the utility to propose a project that does not meet the criteria if it has reason to believe a viable NWA exists.
  - Adds provision for consideration of "partial" or "hybrid" NWA.
  - Adds ability for utility to consider NWA in highly utilized areas of the distribution system.
  - Clarifies that NWA will be compared to wires based on the factors of prudency, reliability, environmental responsibility, and comparison of costs and benefits.
- Reporting Section
  - Provides additional information on the content in the 3-Year SRP Plan, including lessons learned from NWA implementation, trends in DER, and forward looking NWA opportunities.
  - Reorganizes and clarifies content of Annual Reports.
- Performance Incentive Section
  - Lifts language from EE Standards providing the utility an opportunity to propose a performance incentive for SRP.

## Issues Not Addressed

There are three Issues that are not fully addressed in this version of the Standards and Targets. We observe that these issues are already under discussion in the SIRI process, and potentially in the Docket 4600 proceeding. They are:

- **Strategic Electrification:** How will the continuing evolution of very efficient and potentially environmentally beneficial "electrification" technologies such as heat pumps and electric vehicles be treated?
  - To the extent that these technologies are considered "already coming into the market," efficiency strategies and services can be (and are to some extent being) provided for them.

  - The parties have not reached a consensus on whether the LCP statute permits aggressive promotion of "conversion" strategies by the utility even if they could be considered environmentally and economically beneficial. (As noted below this issue has relevance to the discussion of efficiency services for "delivered fuels.")
- **Delivered fuels:** How will efficiency services be provided to "unregulated" or what we sometimes call "delivered fuels" customers? Interestingly, two of the major relevant sectors (non-natural gas home heating, and transportation) are the sectors identified above.
  - Traditionally it has been assumed that monopoly regulated ratepayers should not have SBC funds (intended for their fuel's efficiency) provided to offer efficiency services for another fuel (e.g. oil and propane). Massachusetts appears to be at least a partial exception to this practice.
  - On the other hand Rhode Island is proposing to use "a little" SBC funding for delivered fuel efficiency. It is nowhere near investing in "all cost-effective" delivered fuel efficiency. A significant policy challenge faces Rhode Island on this issue (as it does many other jurisdictions).
  - Some use of funds from other revenue streams (RGGI) has been targeted to this purpose. Proposals have been made (but not legislatively enacted) to have some kind of assessment to fund energy efficiency for other fuels in a manner comparable to the SBC for electric and gas.
  - Financing programs such as the RIIB and its products which are fuel neutral begin to offer options for these customers.
  - And finally, potential electrification of new portions of the economy may provide a rationale (and even an urgency) for treating new technologies under the framework of regulated fuel LCP.
- **Demand Response and Load management:** The growing importance of load management and demand response for a large and potentially growing number of purposes and benefits is an increasingly important issue. These strategies are clearly authorized in the LCP legislation, but have not received the attention and investment that traditional energy efficiency measures have.
  - National Grid is conducting pilots in Massachusetts and in New York, and also in Rhode Island through its Connected Solutions effort and its new Commercial and Industrial efforts in 2017.
  - Analytical work needs to be done to calculate the costs and benefits of demand response and load management measures.

We note that this capability is already clearly mandated as part of LCP, but we admit that it has not received the level of attention of "more traditional" energy efficiency.

- The EERMC through its Consultant Team has begun to investigate the potential for much more systematic and focused investment in the creation of this "capability" by utilities.
- It is our observation that the current practices are limited, and focused primarily in the large C&I and institutional sectors, but may be limited for them as well.
- We believe there is an increasingly urgent need to develop both demand response and load management capabilities and compensation mechanisms.
- We have not found or included in this set of Targets new targets for load management.
- We believe the Docket 4600 proceeding and the SIRI discussions provide opportunities to advance this discussion, and we believe the 2018-20 Three Year Plan should specifically address this opportunity.

## IV. Economic Considerations

What has happened with energy efficiency in Rhode Island is remarkable. Rhode Island's 2006 Least Cost Procurement mandate has driven a level of effort, savings and benefit to RI customers that have put it at the forefront nationally.[8] This new approach allowed Rhode Island to gain this success by reversing the historical approach of setting spending levels first (i.e., budget caps) and then setting savings targets and program designs as a function of spending. While the 2018-20 proposed targets actually represent a "tilted plateau" in the downward direction, they still represent a strong challenge as targets start to recognize the pervasive (and societally beneficial) effects of standards improvement and deeper penetrations of savings technologies.

### It is too early to set budgets related to the recommended savings targets

Stakeholders have discussed whether this recommendation and filing should include estimated budgets needed to achieve the proposed targets, and/or whether limitations on budgets should be recommended in conjunction with this filing. The Consultant Team recommends that the primary objective of this filing is to set energy savings targets based on our best research and analysis of the cost-effective energy efficiency available in Rhode Island. This approach is the same as the approach taken by the EERMC in 2010 and 2013. The Consultant Team's position is that it is not appropriate to suggest estimated budgets for the 2018-2020 time-period in this filing. The Consultant Team believes that the cost per unit of energy saved, cost-effectiveness and efficiency, and total budgets are critically important and must be developed through comprehensive analysis and research, and monitored rigorously. Nevertheless, there are many variables that drive costs up and/or down and the individual and overall impact of these variables in 2018-20 cannot be known with any reasonable degree of certainty today. For example, the total cost of a given year's energy efficiency investments is largely determined by the measure mix and strategies prescribed in the annual efficiency plan.

[8] See ranking for 2016 at: http://aceee.org/research-report/u1606

The Consultant Team's opinion is that cost and budget metrics should be developed and refined throughout the Three Year planning cycle. Initial budgets for each year (2018-2020) will be developed over the course of 2017 and proposed in the Three Year 2018-2020 Energy Efficiency Plan to be submitted to the Commission on September 1, 2017. Then, each subsequent Annual energy efficiency plan filing will include a more refined cost and budget proposal based on the best and current information. Through this process, the Commission and Collaborative stakeholders will have four opportunities to review and consider energy efficiency investment costs and budgets, as well as the Targets themselves.

We would also emphasize that as changes it the potential for savings emerge, the associated costs and benefits may well have a significant impact on actual implementation budgets.

## Other factors may contribute to maximizing cost-efficiency and reducing ratepayer impacts

There are a number of potential strategies and opportunities for Rhode Island to increase gas and electric savings per dollar of ratepayer contribution. These include:

- **New Financing Strategies:** The creation of RIIB in 2015 has demonstrated Rhode Island's dedication to increasing the availability of affordable financing to advance energy efficiency investment in the state. This effort expanded the scope of an existing Rode Island financing entity with a great track record, and it built on the successful Department of Energy ("DOE") effort led by the OER that has helped leverage National Grid expenditures. The DOE grant that funded RIRIPEP brought $700,000 dollars of federal money into the state to help mobilize efficiency services to State buildings, schools and other municipal facilities. National Grid was an active and effective partner in that effort, and it leveraged and increased the cost-efficiency of National Grid's efforts by gaining new partners and participants.
- **Commercial PACE:** The RIIB is now offering a Commercial Property Assessed Clean Energy ("commercial PACE") program that holds great promise for increasing access to efficiency financing for commercial customers. The PACE financing effort could, in turn, help leverage more customer investment at lower program cost to National Grid. In both 2026 and in the proposed 2017 Annual Plan, funding is being made available from the System Benefit Charge to help leverage millions of dollars of funding for Municipal and public entities to invest in efficiency through the RIIB and in partnership with National Grid.
- **Additional new lending strategies -** National Grid is working to expand the scope of its small-commercial on-bill financing strategies and its offerings in the large customer sector of the market with loan products. Success on these fronts could help lower the utility's unit cost of savings and increase participation.

- **Rhode Island Lead by Example:** The Impressive initiative by the Raimondo Administration to pursue aggressive efficiency and renewable energy development in state facilities highlights the kind of effort that can be required to move efficiency to the forefront of attention in sectors of the economy that have not always been leaders in energy efficiency.
- **EERMC Input:** The EERMC has invested in additional consulting expertise from Finance Expert to work with the Consultant Team, National Grid, RIIB and other parties to ensure that the emergence of these new financing strategies follows best practices, and is supported by close cooperation and program coordination among all the parties.

# V. 2018-2020 Savings Targets and LCP Standards Conclusion

The Consultant Team recommends that the EERMC adopt these proposed targets for electric and gas savings as its proposal to the Commission for savings targets that the National Grid energy efficiency programs should plan to achieve in the years 2018, 2019, and 2020.

The Consultant Team also recommends that the EERMC adopt the attached proposed revisions to the EE and SRP Standards as its proposal to the Commission for proposed modifications to the Standards for the 2018-2020 Three Year Planning period.

# Appendix A: Proposed Revisions to the Standards

## CHAPTER 1 – Energy Efficiency Procurement

### 1.1. Introduction

A. Energy Efficiency Procurement (EEP) as mandated by §39-1-27.7, is intended to complement system reliability and supply procurement as provided for in §39-1-27.8, with the common purpose of meeting electrical and natural gas energy needs in Rhode Island, in a manner that is optimally cost-effective, reliable, prudent and environmentally responsible.

B. In order to adhere to the principles set forth in §39-1-27.7 and to meet Rhode Island's energy system needs in a least cost manner, the EE Standards set forth guidelines for the development of least cost energy efficiency plans.

### 1.2. Definitions

A. Energy efficiency

Energy efficiency is defined as the reduction of energy consumption or strategic and beneficial management of the time of energy use within a defined system. A system may be a residence, a place of business, a public accommodation, or an energy production, delivery, and end-use consumption network.

Energy Efficiency Plans[9] should be designed where possible to complement the objectives of Rhode Island's energy efficiency, renewable energy, and clean energy programs, and describe their interaction with them, including, but not limited to the System Reliability Procurement Plan; Renewable Energy Standard; the Renewable Energy Growth Program; the Net Metering Program; and the Long-Term Contracting for Renewable Energy Standard. Energy Efficiency Plans should also be coordinated where possible with other applicable energy procurement, planning, and investment programs, including, but not limited to, Standard Offer Supply Procurement.

Innovation. Energy Efficiency Plans should address new and emerging issues as they relate to least cost procurement (e.g., CHP, strategic electrification, integration of grid modernization, gas service expansion, distributed generation and storage technologies, and energy efficiency services for non-regulated fuels, etc.), as appropriate, including how they may meet State policy objectives and provide system, customer, environmental, and societal benefits.

[9] Energy Efficiency Plans refers to both the EE Procurement Plan (or Three-Year Plan) and EE Program Plan (or Annual Plan), as applicable.

Comprehensiveness. The Utility should consistently design programs and strategies to ensure that all customers have an opportunity to benefit comprehensively through types of measures or depth of services, realizing both near-term and long-lived savings opportunities where appropriate, from expanded investments in this low-cost resource. The programs should be designed and implemented in a coordinated fashion by the Utility, in active and ongoing consultation with the Council.

i. Equity. The portfolio of programs proposed by the Utility should be designed to ensure that different sectors and all customers receive opportunities to participate in and secure efficiency resources lower cost than the cost of supply.

B. Cost-effectiveness

The Utility shall assess measure, program and portfolio cost-effectiveness according to a benefit-cost test that builds on the Total Resource Cost Test approved by the Commission in Docket 4443, but that more fully reflects the policy objectives of the state with regard to energy, its costs, benefits, and environmental and societal impacts. The Utility shall, after consultation with the Council, propose the specific benefits and costs to be reported, and factors to be included, in the Rhode Island Benefit Cost Test (RI Test) and include them in Energy Efficiency Plans. These benefits should include resource impacts, non-energy impacts, distribution system impacts, economic development impacts, and the value of greenhouse gas reductions, as described below. The accrual of specific non-energy impacts to only certain programs or technologies, such as income-eligible programs or combined heat and power, may be considered.

With respect to the value of greenhouse gas reductions, the RI Test shall include the costs of $CO^2$ mitigation as they are imposed and are projected to be imposed by the Regional Greenhouse Gas Initiative. The test shall also include any other utility system costs associated with reasonably anticipated future greenhouse gas reduction requirements at the state, regional, or federal level for both electric and gas programs. A comparable benefit for greenhouse gas reduction resulting from natural gas or delivered fuel energy efficiency or displacement may be considered. The test may include the value of greenhouse gas reduction not embedded in any of the above. The test may also include the costs and benefits of other emissions and their generation or reduction through Least Cost Procurement.

Benefits and costs that are projected to occur over the term of the Energy Efficiency Plans shall be stated in present value terms in the RI Test calculation, using a discount rate that appropriately reflects the risks of the investment of customer funds in energy efficiency; in other words, a discount rate that indicates that energy efficiency is a low-risk resource in terms of cost of capital risk, project risk, and portfolio risk. The discount

rate shall be reviewed and updated in the Energy Efficiency Plans, as appropriate, to ensure that the applied discount rate is based on the most recent information available.

The Utility shall provide a discussion of the carbon impacts efficiency and reliability investment plans will create, whether captured as benefits or not.

C. Reliable

Build on prior plans. Energy Efficiency Plans shall describe the recent energy efficiency programs offered by the Utility and highlight how the Energy Efficiency Plans supplement and expand 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.

i. Build on prior programs. Utility program development shall proceed by building upon what has been learned to date in Utility program experience, systematically identifying new opportunities and pursuing comprehensiveness of measure implementation as appropriate and feasible.

D. Prudent

Plan based on potential assessments. The Utility shall use the Council's Opportunity Report as issued on July 15, 2008, or other assessments of potential, as resources in developing its Three-Year Plan. The Utility shall include in its Three-Year Plan an outline of proposed strategies to supplement and build upon these assessments of potential.

Unlocks capital and effectively uses funding sources. Energy Efficiency 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. Energy Efficiency Plans shall address how the Utility 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.

Three-Year Plans shall be developed to propose strategies to achieve the energy efficiency savings targets that shall be proposed by the EERMC and approved by the Commission 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 Three-Year Plan shall contribute to a sustainable energy efficiency economy in Rhode Island, respond to and transform evolving market conditions, strive to increase participation, and provide widespread consumer benefits.

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.

i. 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 Utility shall include wherever possible and practical partnerships with existing educational and job training entities.

E. Environmentally Responsible.

Environmental responsibility is indicated by the procurement of energy savings, compliance with State environmental policies, and the proper valuation of greenhouse gas reduction benefits.

## 1.3. EE Procurement Plan

A. The Utility Energy Efficiency and Conservation Procurement Plan (The EE Procurement Plan or Three-Year Plan) submitted on September 1, 2008 and triennially thereafter on September 1, shall propose overall budgets and efficiency targets for the three years of implementation beginning with January 1 of the following year. These budgets and targets shall be illustrative and provisional[10] and shall guide annual energy efficiency program plans over the three year period.

B. The Three-Year Plan shall identify the strategies and an approach to planning and implementation of programs that will secure all cost-effective energy efficiency resources that are lower cost than supply and are prudent and reliable, consistent with the definitions provided herein. The Three-Year Plan shall contain sections which describe

i. Strategies and approaches to planning.

ii. Cost-effectiveness

iii. Prudency and Reliability

iv. Funding Plan and Initial Targets

a. The Utility shall develop a funding plan using, as necessary, the following sources of funding to meet the budget requirement of the

[10] As the Three-Year Plan is illustrative and provisional, variances between Annual Plans and Three-Year Plans due to changes in factors such as, but not limited to, sales forecasts, funding sources, avoided costs, and evaluation results may be acceptable, subject to Commission review of Utility explanation for those variances.

Three-Year Plan and fulfill the statutory mandate of Least Cost Procurement. The Utility shall utilize as necessary and available, the following sources of funding for the efficiency program investments:

(1) the existing System Benefits Charge (SBC);

(2) revenues resulting from the participation of energy efficiency resources in ISO-New England's forward capacity market (FCM);

(3) proceeds from the auction of Regional Greenhouse Gas Initiative (RGGI) allowances pursuant to § 23-82-6 of the General Laws;

(4) funds from any state, federal, or international climate or cap and trade legislation or regulation including but not limited to revenue or allowances allocated to expand energy efficiency programs;

(5) a fully reconciling funding mechanism, pursuant to R.I.G.L. § 39-1-27.7, which is a funding mechanism to be relied upon after the other sources as needed to fully fund cost-effective electric and gas energy efficiency programs to ensure the legislative mandate to procure all cost effective efficiency that is lower cost than supply is met; and

(6) other sources as may be identified by the EERMC, the OER, and the Utility.

b. The Utility shall include a preliminary budget for the Three-Year Plan covering the three-year period that identifies the projected costs, benefits, and initial energy saving targets of the portfolio for each year. The budget shall identify, at the portfolio level, the projected cost of efficiency resources in cents/ lifetime kWh or cents/lifetime MMBtu. The preliminary budget and initial energy saving targets may be updated, as necessary, in the Utility's Annual Energy Efficiency Plan.

Performance Incentive Plan Structure, pursuant to Section 1.5

## 1.4. EE Program Plan

A. The Utility shall prepare and file a supplemental filing containing details of implementation plans by program for the next program year (Energy Efficiency Annual Plan or Annual Plan). Beginning in 2014, the Annual Plan shall be filed on October 15 except in years in which a Three-Year Plan is filed; in those years, the Annual Plan filing shall be made on November 1. The Annual Plan filings shall also provide for adjustment, as necessary, to the remaining years of the Three-Year Plan based on experience, ramp-up, and assessment of the resources available.

B. Principles of Program Design. The Annual Plan shall identify and contain programs proposed for implementation by the Utility, pursuant to the Three-Year Plan, and which demonstrate consistency with the principles of program design described above in Section 1.2.

C. Cost-effectiveness. The Utility shall propose a portfolio of programs in the Annual Plan that is cost-effective. Any program with a benefit cost ratio greater than 1.0 (i.e., where benefits are greater than costs), should be considered cost-effective. The portfolio must be cost-effective and programs should be cost-effective, except as noted below.

The Utility shall be allowed to direct a portion of proposed funding to conduct research and development and pilot program initiatives. These efforts will not be subject to cost-effectiveness considerations. However, the costs of these initiatives shall be included in the assessment of portfolio level cost-effectiveness.

The Utility shall allocate funds to the Energy Efficiency and Resource Management Council and Office of Energy Resources as specified in R.I.G.L. § 39-2-1.2. These allocations will not be subject to cost-effectiveness considerations. However, these costs shall be included in the assessment of portfolio level cost-effectiveness.

D. Parity. 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 Utility should design programs to capture all resources that are cost-effective and lower cost than supply. The Utility should consult with the Council to address ongoing issues of parity

E. Final Funding Plan and Budget Amounts, Cost-Effectiveness and Goals

i. The Utility shall include a detailed budget for the Annual Plan covering the annual period beginning the following January 1, that identifies the projected costs, benefits, and energy saving goals of the portfolio and of each program. The budget shall identify at the portfolio level the projected total resource cost of efficiency resources in cents/lifetime kWh or cents/lifetime MMBtu.

ii. The Annual Plans filed October 15 or November 1 will reflect program implementation experience and anticipated changes, shifts in customer demand, changing market costs, and other factors, including a discussion of market transformation impacts as noted in Section 1 above. The annual detailed budget update shall include the projected costs, benefits, and energy saving goals of each program as well as the total resource cost of efficiency resources in cents/lifetime kWh or cents/lifetime MMBtu.

iii. The EE Program Plan shall identify the energy cost savings and bill impacts that RI ratepayers will realize through its implementation.

F. Program Descriptions

i. The Utility shall, as part of its Annual Plan, describe each program, how it will reach its target market, and how it will be implemented. In these descriptions, the Utility shall demonstrate, as appropriate, how the Program is consistent with the principles of program design described above.

ii. In addition to these basic requirements, the plan shall address, where appropriate, the following elements:

a. Comprehensiveness of opportunities addressed at customer facilities;

b. Integration of electric and natural gas energy efficiency implementation and delivery (while still tracking the cost-effectiveness of programs by fuel); energy efficiency opportunities for delivered fuels customers should be addressed to the extent possible;

c. Integration of energy efficiency programs with renewables and other system reliability procurement plan elements;

d. Promotion of the effectiveness and efficiency levels of codes and standards and other market transforming strategies. If the Utility takes a proactive role in researching, developing and implementing such strategies, it may, after consultation with the Council, propose a mechanism to claim credit for a portion of the resulting savings;

e. Implementation, where cost-effective, of demand response and load management measures or other programs that are integrated into the electric and natural gas efficiency program offerings. Such measures/programs will be designed to supplement cost-effective procurement of long-term energy and capacity savings from efficiency measures; and

f. Integration with non-wires alternatives.

G. Monitoring & Evaluation (M&E) Plan

i. The Utility shall include a Monitoring and Evaluation ("M & E") component in its Annual Plan.

ii. This M & E component shall address at least the following:

a. savings verification including, where appropriate, analysis of customer usage; such savings verification should also facilitate participation in ISO-NE's forward capacity market;

b. issues of ongoing program design and effectiveness;

c. any other issues, for example, efforts related to market assessment and methodologies to claim savings from market effects, among others;

d. a discussion of regional and other cooperative M & E efforts the Utility is participating in or plans to participate in; and

e. longer-term studies as appropriate, to assess programs over time.

iii. The Utility shall include in its M & E component any changes it proposes to the frequency and level of detail of Utility program plan filing and subsequent reporting of results.

H. Reporting Requirements

i. The Utility, in consultation with the Council, will propose the content to be reported and a reporting format that is designed to communicate clearly and effectively the benefits of the efforts planned and implemented, with particular focus on energy cost savings and program participation levels across all sectors, to secure all EE resources that are lower cost than supply.

I. Performance Incentive Plan, pursuant to Section 1.5

## 1.5. Efficiency Performance Incentive Plan

A. Pursuant to R.I.G.L. § 39-1-27.7(e) and § 39-1-27.7.1, the Utility shall have an opportunity to earn a shareholder incentive that is dependent on its performance in implementing the approved Annual Plan.

The Utility, in consultation with the Council, will propose in its Three-Year Plan and subsequent Annual Plans, a Performance Incentive (PI) proposal that is designed to promote superior Utility performance in cost-effectively and efficiently securing for customers all efficiency resources lower cost than supply.

The Performance Incentive should be structured to reward program performance that makes significant progress in securing all cost-effective efficiency resources that are lower cost than supply while at the same time ensuring that those resources are secured as efficiently as possible.

The Utility PI model currently in place in RI should be reviewed by the Utility and the Council. The Utility and Council shall also review incentive programs and designs in other jurisdictions including those with penalties and increasing levels of incentives based on higher levels of performance.

The PI may provide incentives for other objectives that are consistent with the goals including, but not limited to, comprehensiveness, customer equity, lifetime net benefits, increased customer access to capital, and market transformation.

B. The PI should be sufficient to provide a high level of motivation for excellent Utility performance annually and over the three year period of the Three-Year Plan, but structured so that customers receive most of the benefit from energy efficiency implementation.

## 1.6. Role of the Council in Plan Development and Approval

A. The Council shall take a leadership role in ensuring that Rhode Island ratepayers receive excellent value from the Three-Year Plan being implemented on their behalf. The Council shall do this by collaborating closely with the Utility on design and implementation of the Monitoring and Evaluation efforts presented by the Utility under the terms of Section 1.4 D, and if necessary, provide recommendations for modification that will strengthen the assessment of Utility programs.

B. In addition to the other roles for the Council indicated in this filing, the Utility shall seek ongoing input from, and collaboration with the Council on development of the Three-Year Plan and Program Plans, and on development of annual updates, if any, to the Three-Year Plan. The Utility shall seek to receive the endorsement of the Plan by the Council prior to submission to the Commission.

C. The Utility and the Council shall report to the PUC a process for Council input and review of its 2008 EE Procurement Plan and EE Program Plan by July 15, 2008 and triennially thereafter.

D. The Council shall vote whether to endorse the Three-Year Plan by August 15, 2008 and triennially thereafter. If the Council does not endorse the Plan then the Council shall document the reasons and submit comments on the Plan to the PUC for their consideration in final review of the Plan.

E. The Utility shall, in consultation with the Council, propose a process for Council input and review of its Three-Year Plan and Annual Plan. This process is intended to build on the mutual expertise and interests of the Council and the Utility, as well as meet the oversight responsibilities of the Council.

F. The Utility shall submit a draft Annual Plan to the Council and the Division of Public Utilities and Carriers for their review and comment annually at least one week before the Council's scheduled meeting prior to the filing date that year.

G. The Council shall vote whether to endorse the Annual Plan prior to the prescribed filing date, annually. If the Council does not endorse the Annual Plan, the Council shall document its reasons and submit comments on the Plan to the PUC for its consideration in final review of the Plan.

H. The Council shall prepare memos on its assessment of the cost effectiveness of the Three-Year Plans and Annual Plans, pursuant to R.I.G.L. §39-1-27.7(c )(5), and submit them to the PUC no later than two weeks following the filing of the respective Plans with the Commission

## CHAPTER 2 - System Reliability Procurement

### 2.1. Introduction

A. System Reliability Procurement (SRP) as mandated by §39-1-27.7, is intended to complement energy efficiency and conservation procurement, and supply procurement as provided for in §39-1-27.8, with the common purpose of meeting electrical and natural gas energy needs in Rhode Island, in a manner that is optimally cost-effective, reliable, prudent and environmentally responsible.[11]

B. In order to adhere to the principles set forth in §39-1-27.7 and to meet Rhode Island's energy system needs in a least cost manner, the SRP Standards set forth guidelines for the incorporation of energy efficiency, distributed generation, demand response, and other energy technologies (collectively referred to as "non-wires alternatives") into Utility distribution planning. These guidelines seek to enable the deployment of cost-effective non-wires alternatives to achieve state policy goals, optimize grid performance, enhance reliability and resiliency, and encourage optimal investment by the Utility.

C. SRP should be integrated with the Company's distribution planning process and be designed where possible to complement the objectives of Rhode Island's energy efficiency, renewable energy, and clean energy programs, and describe its interaction with them, including, but not limited to the programs described in in Section 1.2.ii. SRP should also be coordinated where possible with other applicable energy procurement, planning, and investment programs, including, but not limited to Standard Offer Supply Procurement and the Infrastructure, Safety and Reliability Plan.

### 2.2. System Reliability Procurement Definitions

A. In order to fulfill the intent of the statute, System Reliability Procurement (SRP) is interpreted to mean an ongoing Company practice to maximize the prudent, reliable and environmentally responsible use of non-wires alternatives (NWA) to meet electric distribution system needs and optimize grid performance, subject to a system whereby wires solutions and NWA solutions can be properly compared for both benefits and costs.

B. Non-wires alternatives (NWA) may be utilized through various approaches to advance the goals of SRP and optimize grid performance as described in 2.1.B. These approaches may include but are not limited to:

   i. Strategic promotion of customer-side NWA through investment or outreach by the Company or a third party

[11] R.I.G.L §39-1-27.7 specifies that standards and guidelines for system reliability procurement may include, but not be limited to: (i) Procurement of energy supply from diverse sources, including, but not limited to, renewable energy resources as defined in chapter 26 of this title; (ii) Distributed generation, including, but not limited to, renewable energy resources and thermally leading combined heat and power systems, which is reliable and is cost-effective, with measurable, net system benefits; (iii) Demand response, including, but not limited to, distributed generation, back-up generation and on-demand usage reduction, which shall be designed to facilitate electric customer participation in regional demand response programs, including those administered by the independent service operator of New England ("ISO-NE") and/or are designed to provide local system reliability benefits through load control or using on-site generating capability.

a. Customer-Side NWA may include but are not limited to:

(1) Least Cost Procurement energy efficiency baseline services

(2) Peak demand and geographically-focused supplemental energy efficiency strategies

(3) Distributed generation[12] generally, including combined heat and power and renewable energy resources[13]

(4) Demand response

(5) Direct load control

(6) Energy storage

(7) Electric vehicles

(8) Controllable or dispatchable electric heat or cooling

(9) Alternative metering and tariff options, including time-varying rates

ii. Utility investment in grid-side tools and technologies

a. Grid-Side NWA may include but are not limited to:

(1) Energy storage

(2) Voltage management

(3) Communications systems

(4) Grid-optimization technologies[14]

(5) Generation to provide or in support of any or all of B(ii)(1)-(4), consistent with Rhode Island General Law.

iii. Combinations of NWA (both customer-side and grid-side) and combinations of NWAs with traditional infrastructure investments

C. Electric distribution system needs

i. Electric distribution system needs shall include, but are not limited to: system capacity (normal and emergency), voltage performance, reliability performance, protection coordination, fault current management, reactive power compensation, asset condition assessment, distributed generation constraints, and operational considerations. Note that not all system needs can be addressed by NWAs.

D. Optimization of grid performance

[12] In order to meet the statute's environmental goals, generation technologies must comply with all applicable general permitting regulations for smaller-scale electric generation facilities.

[13] As defined in the Renewable Energy Standard http://webserver.rilin.state.ri.us/Statutes/TITLE39/39-26/39-26-5.HTM

[14] "Grid-facing" investments may include technologies that automate grid operations and allow the distribution utility to monitor and control grid conditions in near real time. (Source: MA DPU Docket 12-76-A, pg. 2)

i. Optimizing grid performance refers to activities undertaken to improve the performance and efficiency of the electric distribution system by the Company. Performance improvements can include enhanced reliability, peak load reduction, and increased capacity utilization for more efficient use of assets. More efficient delivery of electricity can include optimization of operations and reduced system losses. Costs and data requirements associated with these optimization activities should be considered.

ii. In the longer term, optimizing grid performance can include a response to anticipated changes to the distribution system and the associated planning process.

E. Prudency

i. Prudent planning under SRP will be assessed by:

a. Risks associated with each alternative (ability to obtain licensing and permitting, significant risks of stranded investment, the potential risk reduction of a more incremental approach, sensitivity of alternatives to differences in load forecasts, emergence of new technologies);

b. Potential for synergy savings based on alternatives that address multiple needs;

c. Implementation issues; and

d. Customer responsiveness and ability to potentially modify usage at certain times and seasons.

F. Reliability

i. Reliability will be assessed by the solutions':

a. Ability to meet the identified system needs;

b. Review of anticipated reliability as compared to alternatives;

c. Operational complexity and flexibility; and

d. Resiliency of the system.

G. Environmental responsibility:

i. Environmental responsibility will be assessed by the manner in which the solution advances the goals and objectives of the state energy plan and other environmental policies. Considerations of environmental responsibility may include impacts on greenhouse gas emissions, criteria air pollution, land use, water, and other resources.

H. Cost-effectiveness

i. Cost-effectiveness will be assessed by a comparison of costs and benefits as described in 2.3.F.

## 2.3. Assessment of Applicability of Non-Wires Alternatives (SRP Planning)

A. Identified electric distribution system needs that meet the following criteria will be

evaluated for potential NWAs that could reduce, avoid or defer a T&D wires solution over an identified time period.

i. The need is not based on asset condition;

ii. The wires solution, based on engineering judgment, will likely cost more than approximately $1 million; the cost floors may vary across different project types and time frames;

iii. If load reductions are necessary, then they are expected to be less than 20 percent of the relevant peak load in the area, or sub area in the event of a partial solution, of the defined need;

iv. Start of wires alternative construction is at least 30 months in the future;

v. At its discretion, the Utility may consider and, if appropriate, propose a project that does not pass one or more of these criteria if it has reason to believe that a viable NWA solution exists, assuming the benefits of doing so justify the costs.

B. If the Company determines that an NWA cannot defer the entire T&D project, the Company is encouraged to examine the application of NWAs to avoid or defer part of the overall scope of the project. This shall be referred to as 'partial' or 'hybrid' NWA. The Utility will review reduction of the discrete portions of the entire T&D plan. Examples include: 1) reducing two new feeders to one new feeder; 2) reducing a new proposed fully build station (2 power transformers, 8 feeders) to a partial station (1 power transformer, 4 new feeders).[15]

C. To further incorporate NWAs into the Company's distribution planning process, the Company may investigate the application of NWAs to reduce or manage load in areas including, but not limited to, highly utilized distribution systems, where construction is physically constrained, and where demand growth is anticipated, to prolong the useful lifetime of existing systems. It is understood that an economic analysis framework for this type of NWA would need to be developed. With wider penetration, load reduction NWAs are expected to generally defer or reduce infrastructure investment in a similar manner to Energy Efficiency efforts.

D. A more detailed version of these criteria may be developed by the distribution utility and shared with the Council and other stakeholders.

E. Feasible NWAs will be compared to traditional solutions based on reliability, prudency, environmental responsibility, and the comparison of costs and benefits as defined below[16].

F. Comparison of benefits and costs

i. The analysis of costs and benefits for each solution shall include a full assessment of costs and benefits of the various technologies, measures, and/or strategies included in the NWA as guided, where applicable, by the cost-effectiveness test outlined in Section 1 of these Standards. The

[15] It is understood that reduction in the size of equipment (wire, transformers, etc.) offers little to no cost reduction to enable an economic NWA due to the discrete sizing of these components, and the Utility is not expected to pursue such analysis.

[16] It is recognized that individual attributes can be compared to each other, but the ability to compare all the attributes together may not be able to be done at this time and may be the subject of other proceedings.

following financial analysis should be conducted for each solution where an NWA is a viable option:

a. A calculation of the net present value benefit of deferring the traditional alternative over a set time period or eliminating the traditional alternative entirely as applicable.

b. A calculation of the net present value cost of the NWA over the same time period as the net present value calculation in (a).

c. A cost benefit analysis, which shall consist of a comparison of (a.) and (b.) plus any other estimated benefits

(1) Other estimated benefits[17] shall include but are not limited to: avoided capacity costs; avoided energy costs; avoided transmission costs; avoided ancillary service costs; market price suppression effect; improved reliability; revenues from grid resources; avoided greenhouse gas emissions; other environmental externalities; avoided environmental compliance costs; economic development benefits, and any site-specific, or option-specific benefits or costs directly attributable to the location of the project or the proposed alternatives, provided however that these benefits have not already been counted in the justification of any other underlying program (e.g. the Energy Efficiency Procurement Plan, the Renewable Energy Growth Program, the Net Metering Program, the Long-Term Contracting for Renewable Energy Standard, etc.) to avoid double-counting of benefits.

(2) Recognizing that quantification methods for some benefits are not yet defined, and may need further research, where benefits cannot be reasonably quantified, a qualitative impact analysis or description of potential benefits should be included.

ii. Where there is no wires solution yet identified consistent with Section 2.3.C, a traditional benefit/cost analysis (consistent with this section) for the NWA should be done, and if it is greater than 1 the NWA can be recommended for approval.

## 2.4. <u>Three Year System Reliability Procurement Plan</u>

A. The Utility System Reliability Procurement Plan ("The SRP Plan") submitted on September 1, 2017 and triennially thereafter on September 1, shall describe general planning principles and potential areas of focus for System Reliability Procurement for the three years of implementation beginning with January 1 of the following year. Such Plans shall include but are not limited to:

i. Proposed evolutions to definitions, identification, and assessment of non-wires alternatives which may include but are not limited to:

a. Observations and lessons learned from the most recent three year

[17] It is expected that site-specific avoided distribution costs and reduced operations and maintenance costs would be captured in the calculation of the net present value benefit of deferring or avoiding the traditional alternative.

period.

b. Trends in distributed energy resource technology and analytics, either grid-side or customer-side, that may influence NWA planning over the three year period.

ii. Anticipated scope of NWA deployment in coming three year period.

a. In-progress NWA projects projected to continue, and a high-level timeline.

b. Projected areas of focus[18] for distribution planning review that may result in the identification of new NWA projects.

iii. Description of how the SRP Plan complements the objectives of Rhode Island's energy efficiency, renewable energy, and clean energy programs listed in 2.1.C.

iv. Proposed shareholder incentive framework.

**2.5. <u>Annual System Reliability Procurement Report</u>**

A. The Utility shall prepare and file a supplemental filing on November 1, 2017 and annually thereafter on November 1, containing details of implementation of the SRP Plan for the next program year ("The SRP Report"). Such reports will include but are not limited to:

i. Identification and NWA viability determination of needs which passed the initial screening in Section 2.3;

ii. Identification of needs where an NWA project was selected as a solution including:

a. A summary of the comparative analysis following the criteria outlined in Section 2.3 above;

b. Characterization of the transmission or distribution need including:

(1) The magnitude (daily and annual load shape curves, voltage improvement, etc.) if applicable, the projected year and season by which a solution is needed, and other relevant timing issues;

(2) Description of the traditional wires solution and how it is impacted by the NWA[19];

(3) Description of the sensitivity of the need and T&D investment to load forecast assumptions.

iii. Description of how the NWA projects complement the objectives of Rhode Island's energy efficiency, renewable energy, and clean energy programs listed in 2.1.C;

iv. Implementation plans for the newly selected NWA projects and any

[18] It is not anticipated that this will include project specifics, which are dependent on needs and screening; those are expected in Annual SRP Reports. In the absence of project specifics or budgets, this section is intended to give a picture of the expected size and scope of NWA efforts during the three year period and a sense of whether it is expected to grow relative to current activities.

[19] Description should include technology proposed, net present value, costs (capital and O&M), revenue requirements, and timeline for the upgrade

previously approved projects being proposed for continuation, which should include:

a. A description of the NWA solution, including technology, customer engagement, cost (capital and O&M), net present value, and timing;

b. The ability of affected customers to participate in the proposed project;

c. A description and results of any competitive bid (Request for Proposals) processes that were conducted to inform the description in 2.5.A.iv.a;

d. The proposed NWA investment scenario(s);

e. The proposed technology ownership and contracting considerations or options;

f. The proposed evaluation plans.

v. Funding plans for the selected NWA projects and any previously approved projects being proposed for continuation. The Utility may propose to utilize funding from the following sources for system reliability investments:

a. Capital funds that would otherwise be applied towards traditional wires based alternatives, where the costs for the NWA are properly capitalized under generally accepted accounting principles and can be properly placed in rate base for recovery in rates along with other ordinary infrastructure investments;

b. Existing Utility EE investments as required in Section I of these Standards and the resulting Annual Plans;

c. Additional energy efficiency funds to the extent that the energy efficiency-related NWA can be shown to pass the cost benefit test as outlined in Section 1 of these Standards and such additional funding is approved;

d. Utility operating expenses to the extent that recovery of such funding is explicitly allowed;

e. Identification of customer contribution or third party investment that may be part of a NWA based on benefits that are expected to accrue to the specific customers or third parties;

f. Any other funding sources that might be required and available to complete the NWA.

vi. Status of any previously selected and approved projects and pilots;

vii. Identification of any methodological or analytical tools to be developed in the year;

viii. Total SRP Plan budget, including administrative and evaluation costs;

ix. Proposed shareholder incentive;

B. To the extent the implementation of a NWA may contribute to an outage event that is beyond the control of the Company, the Company may apply to the Commission for an exclusion of such event in the determination of Service Quality performance.

**2.6. <u>SRP Performance Incentive Plan</u>**

A. Utility shall have an opportunity to earn a shareholder incentive that is dependent on its performance in implementing the approved SRP Plan.
B. The Utility, in consultation with the Council, will propose in its SRP Plan a Performance Incentive (PI) proposal that is designed to promote superior Utility performance in cost-effectively and efficiently delivering least cost and reliable non-wires alternatives projects.
C. The Performance Incentive should be structured to reward program performance that makes significant progress in securing least cost and reliable non-wires alternatives projects while at the same time ensuring that those resources are secured as efficiently as possible.
D. The PI may provide incentives for other objectives that are consistent with the goals including but not limited to resiliency, connectivity, and operability.
E. The PI should be sufficient to provide a high level of motivation for excellent Utility performance annually and over the three year period of the SRP Plan, but structured so that customers receive most of the benefit from SRP implementation.

# Appendix B: Historical and Projected Core Program Savings

The following two tables were used to derive Trend lines that reflect *Actual* savings through 2015; *Planned* savings filed for 2016 and 2017; and *Core Program* projections from these "business as usual" trends for 2018-2020. The 2018- 2020 projected savings numbers are not the full projected targets as they do not include factors of Evolving Potential expected through industry innovation and evolution.

**Electric Program Savings (MWh) -- Annual**

| | Actual | | | | | | | Planned | | Core Program Projections | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program | 2009 | 2010 | 2011 | 2012 | 2013 | 2014* | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 3-yr % of portfolio |
| Small Business Direct Install | 9,220 | 12,741 | 16,871 | 19,008 | 21,358 | 18,089 | 15,876 | 12,165 | 12,136 | 10,000 | 10,000 | 10,000 | 5.4% |
| Large Commercial New Construction | 8,304 | 7,678 | 11,561 | 20,898 | 30,613 | 34,236 | 37,205 | 15,728 | 14,270 | 14,891 | 15,761 | 16,641 | 8.5% |
| Large Commercial Retrofit | 32,557 | 32,019 | 30,848 | 38,398 | 41,707 | 36,460 | 59,921 | 67,030 | 77,611 | 82,892 | 84,957 | 86,264 | 45.8% |
| **C&I Total** | **50,081** | **52,438** | **59,280** | **78,304** | **93,678** | **88,785** | **113,002** | **94,923** | **104,017** | **107,783** | **110,718** | **112,905** | **59.7%** |
| Single Family - Income Eligible Services | 1,713 | 2,205 | 2,243 | 3,404 | 3,735 | 4,911 | 4,010 | 4,061 | 4,350 | 4,084 | 3,785 | 3,399 | 2.0% |
| Income Eligible Multifamily | | | | | 2,570 | 3,276 | 3,249 | 2,830 | 2,726 | 2,757 | 2,699 | 2,661 | 1.5% |
| **Income Eligible Total** | **1,713** | **2,205** | **2,243** | **3,404** | **6,305** | **8,187** | **7,259** | **6,891** | **7,076** | **6,841** | **6,484** | **6,059** | **3.5%** |
| Residential New Construction | 636 | 782 | 613 | 671 | 753 | 813 | 1,263 | 1,213 | 1,065 | 1,013 | 1,009 | 1,020 | 0.5% |
| ENERGY STAR HVAC | 324 | 421 | 680 | 895 | 1,664 | 1,639 | 1,040 | 1,011 | 1,376 | 1,245 | 1,479 | 1,764 | 0.8% |
| Energy*Wise* | 4,000 | 6,614 | 9,696 | 8,361 | 11,434 | 13,242 | 19,484 | 11,729 | 6,545 | 5,253 | 4,052 | 3,190 | 2.3% |
| Energy*Wise* Multifamily | | | | | 1,733 | 3,559 | 4,592 | 4,061 | 3,519 | 2,950 | 2,763 | 2,617 | 1.5% |
| Home Energy Reports | | | | | 10,002 | 36,307 | 31,177 | 32,186 | 26,184 | 24,795 | 23,555 | 22,377 | 12.7% |
| ENERGY STAR Lighting | 19,871 | 14,292 | 17,460 | 22,533 | 28,376 | 30,668 | 41,245 | 43,098 | 48,856 | 45,119 | 29,396 | 19,134 | 16.9% |
| Residential Consumer Products | 4,918 | 4,523 | 6,037 | 5,499 | 5,090 | 5,269 | 3,760 | 4,647 | 4,708 | 3,690 | 3,745 | 3,826 | 2.0% |
| **Residential Total** | **29,749** | **26,632** | **34,486** | **37,959** | **59,052** | **91,497** | **102,561** | **97,945** | **92,253** | **84,065** | **65,999** | **53,929** | **36.8%** |
| ***Portfolio Total*** | **81,543** | **81,275** | **96,009** | **119,667** | **159,035** | **188,469** | **222,822** | **199,759** | **203,346** | **198,689** | **183,201** | **172,893** | |

*2014 results exclude the approximately 80,000 MWh Toray Combined Heat and Power project that was completed in that year.

## Gas Program Savings (MMBtu) -- Annual

| | Actual | | | | | | | Planned | | Core Program Projections | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Program** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **3 yr % of Portfolio** |
| Small Business Direct Install | | | 5,346 | 4,853 | 4,599 | 8,171 | 4,758 | 3,667 | 3,639 | 4,000 | 4,000 | 4,000 | 1% |
| Large Commercial New Construction | | | 54,721 | 27,668 | 32,968 | 51,958 | 36,459 | 43,424 | 53,516 | 44,003 | 44,003 | 44,003 | 11% |
| Large Commercial Retrofit | 117,420 | 88,696 | 31,009 | 95,485 | 117,284 | 129,434 | 136,547 | 133,613 | 187,938 | 160,638 | 161,722 | 161,063 | 41% |
| C&I Multifamily | | | | | 5,785 | 6,121 | 12,878 | 9,490 | 4,434 | 6,640 | 6,640 | 6,640 | 2% |
| **Total C&I** | **117,420** | **88,696** | **91,076** | **128,006** | **160,636** | **195,684** | **190,642** | **190,194** | **249,527** | **215,280** | **216,365** | **215,705** | **55%** |
| Single Family - Income Eligible Services | 12,599 | 1,544 | 2,572 | 5,516 | 5,743 | 8,039 | 10,990 | 9,368 | 11,032 | 9,802 | 10,087 | 10,371 | 3% |
| Income Eligible Multifamily | | | | | 18,477 | 21,532 | 21,061 | 19,915 | 15,810 | 17,745 | 18,346 | 18,951 | 5% |
| **Total Income Eligible** | **12,599** | **1,544** | **2,572** | **5,516** | **24,220** | **29,571** | **32,051** | **29,283** | **26,842** | **27,547** | **28,433** | **29,321** | **7%** |
| Energy*Wise* | 15,866 | 8,985 | 11,943 | 39,659 | 55,251 | 69,335 | 67,891 | 68,117 | 28,587 | 27,789 | 28,621 | 29,591 | 7% |
| ENERGY STAR HVAC | 49,315 | 40,872 | 14,023 | 56,631 | 41,638 | 33,962 | 31,023 | 26,064 | 27,393 | 29,464 | 31,955 | 34,645 | 8% |
| Energy*Wise* Multifamily | | | | | 8,879 | 16,668 | 18,558 | 17,208 | 11,518 | 12,267 | 12,733 | 13,204 | 3% |
| Home Energy Reports | | | | | 15,248 | 56,694 | 66,882 | 53,989 | 59,164 | 59,343 | 60,832 | 62,394 | 16% |
| Residential New Construction | | | | | 5,713 | 7,115 | 12,732 | 10,907 | 11,575 | 11,096 | 11,369 | 11,641 | 3% |
| **Total Residential** | **65,181** | **49,857** | **25,966** | **96,290** | **126,729** | **183,774** | **197,086** | **176,285** | **138,237** | **139,960** | **145,509** | **151,475** | **37%** |
| ***Portfolio Total*** | **195,200** | **140,097** | **119,614** | **229,812** | **311,585** | **409,029** | **419,779** | **395,762** | **414,606** | **382,787** | **390,307** | **396,502** | |

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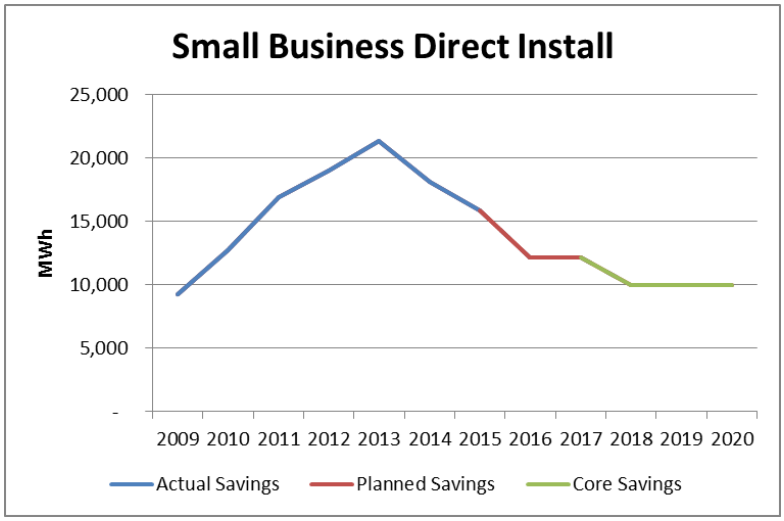
The charts and tables below provide trends and examples of historic and projected savings for select core programs.

## Electric Programs

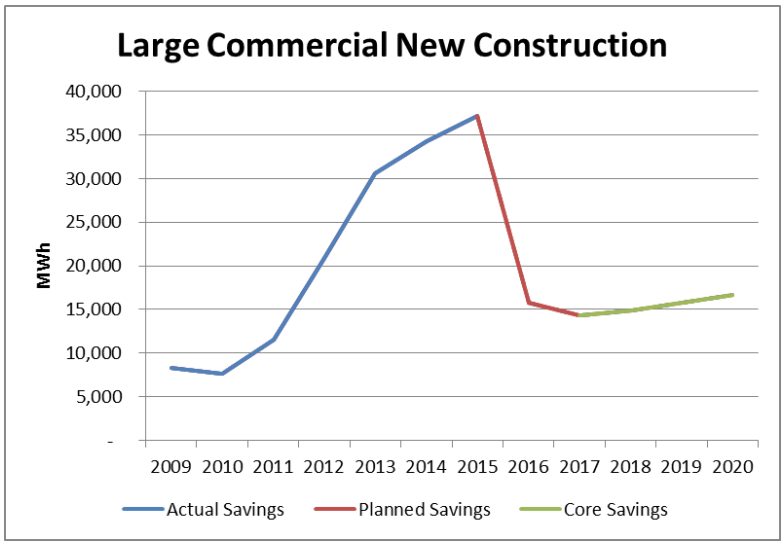
### Commercial and Industrial

**1. Small Business Direct Install program** – provides turnkey services to C&I customers with an average monthly demand of less than or equal to 200 kW.



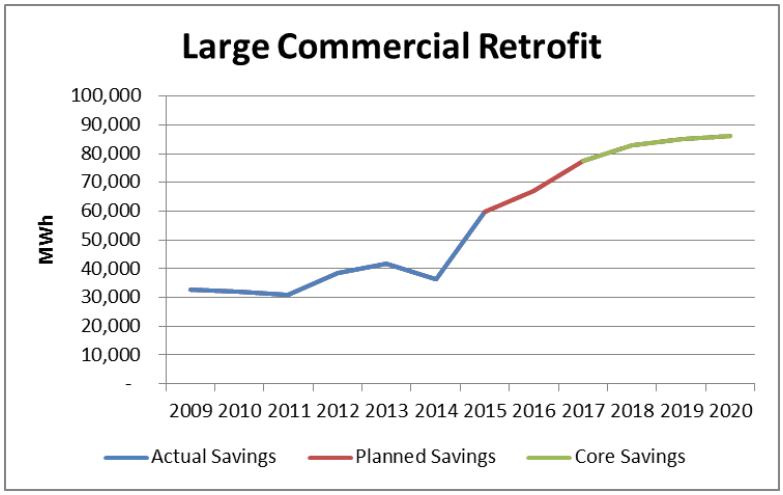

Savings from the Small Business program have been declining since 2013. This is partly due to the success of the upstream lighting initiative, which is offered through the Large Commercial Retrofit program. Because much of the savings from small business customers come from lighting, the Small Business program and upstream lighting initiative compete for much of the same savings in this market. While the drop in participation in Small Business means there is some lost opportunity to implement other measures offered through this program, the upstream lighting initiative is ultimately more cost-effective than offering lighting measures through the Small Business program. We anticipate the downward trend in savings from the Small Business program to level off over the next three year plan, partly due to increased financing opportunities, which should help to counteract the competition for savings from upstream lighting.

**2. Large C&I New Construction program** – provides services, financing and incentives for new buildings, major renovations and tenant fit-ups, as well as for projects involving "end-of-life replacement" of measures.




The New Construction program saw a significant increase from 2011 to 2015. This was largely driven by the success of upstream lighting. Upstream lighting was moved to the Retrofit program as of the beginning of 2016, which accounts for the drop in savings from the New Construction program in 2016. We anticipate an upward savings trend over the next three year plan, despite increasing efficiency requirements in building codes. This is due to increased opportunities for savings from LED lighting and controls where the technology increasing at a faster rate than codes are raising baselines.

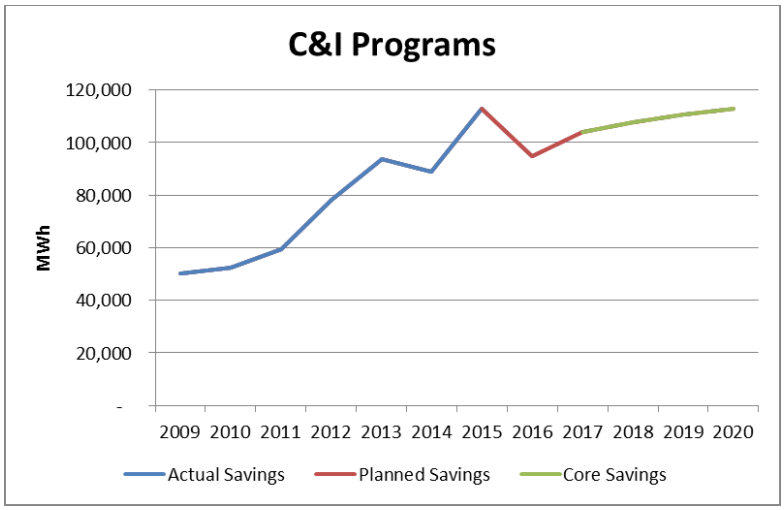
**3. Large C&I Retrofit program** – serves the needs of existing buildings looking to lower energy consumption by providing prescriptive incentives for individual measures or through a custom path involving technical assessments and packaged measures.




Large Commercial Retrofit shows a significant increase over the next three years for several reasons. First, savings from upstream lighting were moved from the New Construction program to the Retrofit

program in 2016. Savings from the retrofit of linear fluorescent lighting should also continue to increase in the coming years. Lastly, savings from industrial process are expected to increase as well. The increases will be tempered by a reduction in the amount of savings from streetlights, which are expected to decrease after 2017 when most retrofits in the state will be complete. Note that the 80,000 MWh savings from the Toray CHP project in 2014 have been removed from the results in the Large Commercial Retrofit chart, leaving a slight dip in savings rather than a large spike if the savings from this project were included.

**4. C&I portfolio** – While the charts above represent historic and projected savings for each individual C&I electric program, the chart below represents savings trends for the C&I electric portfolio as a whole. Also, 4a identifies the various sub-components under each of the three program areas, and 4b further breaks down one of those program sub-components to illustrate the types of factors considered when analyzing potential savings for each sub-component.



**4a. C&I program sub-components.** The Small Business Direct Install program is highlighted in blue, the Large Commercial New Construction program is highlighted in purple, and the Large Commercial Retrofit program is highlighted in green.

**Consultant Team Electric Savings Projections (MWh)**

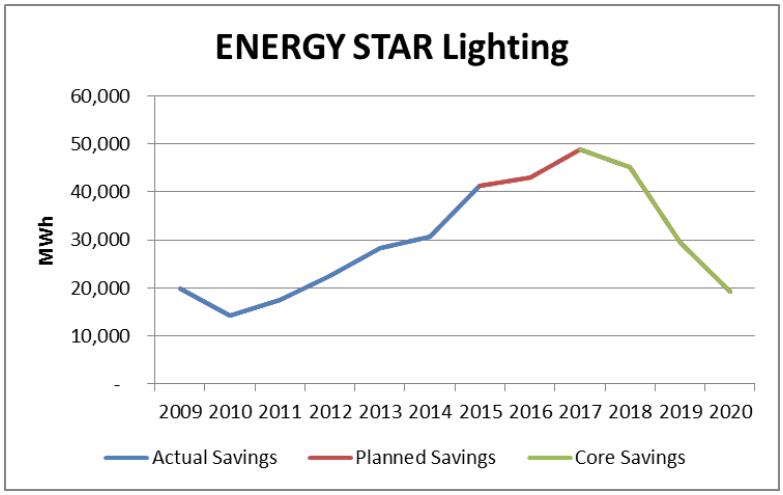
| Program | Measure Type | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| **Small Business** | Small Business | 10,000 | 10,000 | 10,000 |
| **Large Commercial New Construction** | D2 CAIR | 1,100 | 1,200 | 1,300 |
| | D2 Cool Choice | 0 | 0 | 0 |
| | D2 Custom Lighting | 500 | 500 | 500 |
| | D2 Custom Non-lighting | 7,700 | 8,470 | 9,250 |
| | D2 Lights (Prescriptive New) | 1,860 | 1,860 | 1,860 |
| | D2 VSD | 586 | 586 | 586 |
| | C&I Codes | 3,145 | 3,145 | 3,145 |
| **Large Commercial Retrofit** | Street Lighting | 9,317 | 1,491 | 1,491 |
| | EI Custom Non-lighting | 21,550 | 25,350 | 24,050 |
| | EI Custom Lighting | 10,914 | 11,242 | 11,579 |
| | EI Light (Prescriptive) | 10,525 | 10,788 | 11,058 |
| | EI HVAC | 1,086 | 1,086 | 1,086 |
| | EI VSDs | 2,500 | 2,500 | 2,500 |
| | CHP | 2,000 | 5,000 | 5,000 |
| | Upstream Lighting | 24,000 | 25,000 | 26,000 |
| | SEM | 1000 | 2500 | 3500 |
| | **Total** | **107,783** | **110,718** | **112,905** |

**4b. D2 Custom non-lighting** – This refers to a group of measures offered through the Large Commercial New Construction program for which incentives and savings claims are based on a custom engineering calculation or on measured savings after the measure has been installed. These measures (all custom measures other than lighting) are tracked separately from custom lighting measures because lighting makes up such a large portion of the savings. For analytical purposes, it is helpful to see the share of custom savings that are not lighting.

| | Actuals MWh | | | Planned | Proposed MWh | | | |
|---|---|---|---|---|---|---|---|---|
| **D2 Custom Non-Lighting** | 2013 | 2014 | 2015 | 2017 | 2018 | 2019 | 2020 | **Assumptions** |
| Comprehensive Design | 653 | 1,943 | 816 | 900 | 1,000 | 1,100 | 1,200 | The Integrated Design Express pathway will continue the upward savings trend for D2 Custom |
| Compressed Air | 369 | 861 | 965 | 1,000 | 1,200 | 1,300 | 1,400 | The compressed air training initiative will drive more prescriptive compressed air projects |
| Drives & Motors | 2 | 48 | 264 | 400 | 500 | 550 | 600 | |
| HVAC | 173 | 261 | 416 | 600 | 800 | 1,000 | 1,200 | Additional savings from efficient circulator pumps and rooftop controllers. |
| HVAC - Chiller | 0 | 0 | 48 | 100 | 100 | 100 | 100 | |
| Other | 207 | 0 | 0 | 300 | 400 | 500 | 600 | A focus on data centers and EStar rated equipment will yield savings |
| Process | 341 | 1,208 | 1,824 | 1,800 | 1,800 | 1,800 | 1,800 | The Leidos initiative should be expanded, and smaller manufacturers could be engaged through other partners |
| Refrigeration | 335 | 335 | 0 | 1,000 | 1,300 | 1,400 | 1,500 | Put Q Sync and other ECM evap. motors upstream |
| *Miscellaneous Prescriptive* | | | | | | | | |
| BOC | | 67 | 67 | | 100 | 100 | 100 | Add one additional class per year |
| Kitchen Equipment | | | 31 | | 100 | 120 | 150 | Kitchen equipment will see increases from increased attention and going upstream (focus on schools?) |
| Pay for Performance | | 8 | 200 | | 400 | 500 | 600 | More training for RCx professionals and a redesign of the program will pay off in savings in the future |
| **Total D2 Custom Non-Lighting** | | | | | 7,700 | 8,470 | 9,250 | |

## Residential

**5. Energy Star Lighting** – promotes the purchase of qualifying lighting products, primarily at the retail level through buydowns, markdowns and discounts.



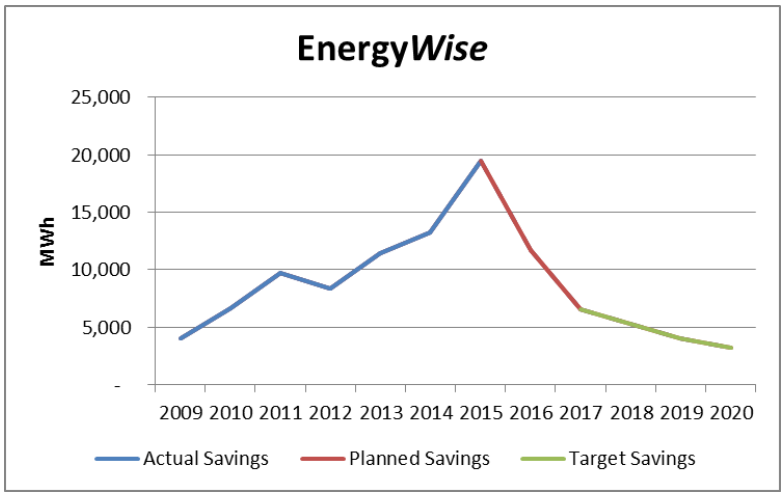

ENERGY STAR (ES) Lighting shows a sharp drop in savings from 2017 and continuing through the 2018-2020 Plan period. ES Lighting savings are projected to decline by 61% from 2017 to 2020. In 2017 ES Lighting represents a projected 49% of sector savings. This falls to 32% of sector savings in 2020.

There are several factors contributing to the decline in ES Lighting savings.

- Decline in unit numbers reflecting fewer available sockets to fill and competition with low cost, non-program value line LEDs.
- Declining net to gross (NTG) ratios as LED prices continue to fall and the effects of program incentives are diminished and free ridership increases.
- Lower gross savings for A-lamp LEDs due to increasingly efficient baselines.

| Retail Lighting Estimates | Units | | | Net Annual kWh | | |
|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| LED A Lamps | 850,000 | 600,000 | 500,000 | 26,154,534 | 14,341,320 | 8,110,480 |
| LED Bulbs (EISA Exempt) | 160,000 | 150,000 | 140,000 | 4,928,851 | 3,850,665 | 2,875,163 |
| LED Fixtures | 130,000 | 120,000 | 100,000 | 5,960,791 | 4,273,584 | 2,534,280 |
| LED Outdoor Fixture | 900 | 1,500 | 2,000 | 88,250 | 138,432 | 173,040 |
| LED School Program Bulb | 11,000 | 9,000 | 7,000 | 301,921 | 216,720 | 134,027 |
| LED Reflector | 160,000 | 155,000 | 150,000 | 5,376,672 | 4,340,543 | 3,360,420 |
| LED Bulb (Hard to Reach) | 50,000 | 55,000 | 60,000 | 2,307,753 | 2,234,856 | 1,946,515 |
| | **1,361,900** | **1,090,500** | **959,000** | **45,118,773** | **29,396,119** | **19,133,926** |

**6. EnergyWise single-family program** -- provides home energy audits for buildings with 1-4 residential units, including direct install of energy saving measures such as Energy Star lighting, as well as specifications of weatherization opportunities (insulation and air-sealing) and associated incentives.

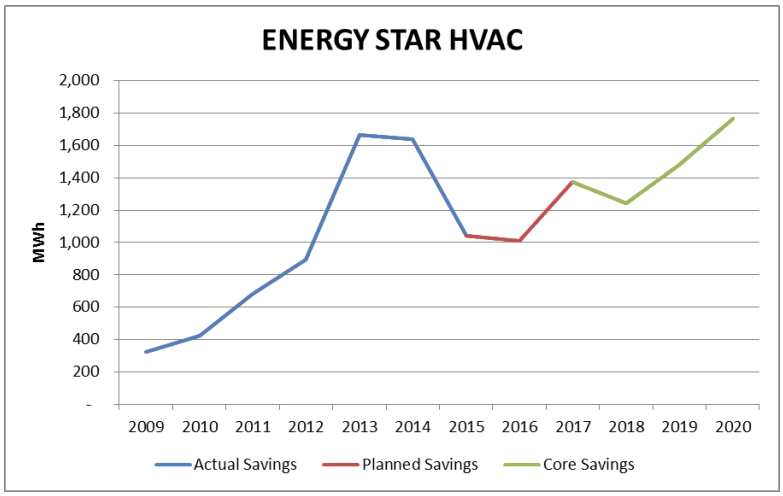



EnergyWise, National Grid's single family retrofit program, also shows a sharp drop in savings from 2017 through 2020 (a 51% reduction). In 2017 EnergyWise represents a projected 7% of Residential sector savings. This falls to 5% of sector savings in 2020.

Much of the decline in EnergyWise savings is due to lower savings from direct install (DI) lighting efforts. For 2017 DI lighting (all LEDs) represents 88% of projected Program savings. EnergyWise lighting savings are expected to decline for largely the same reasons as for ENERGY STAR lighting: fewer lamps and fixtures installed in each year, declining NTG ratios, and lower per lamp gross savings.

For the small, non-lighting portion of EnergyWise Program savings it was assumed that these savings will increase over 2017; 10% in 2018, 15% in 2019, and 2020 in 2020. These increases assume a combination of higher program participation, increased conversion rates for key measures like insulation and air sealing, and possible new measures like Tier 2 advanced power strips.

**7. Energy Star Water Heating and Heating, Ventilation and Air-conditioning (HVAC) program –** provides prescriptive incentives for qualifying equipment, as well as contractor training and support.




The ENERGY STAR HVAC (ES HVAC) Program, which also includes water heaters, shows a fairly steady increase in savings over the 2018-2020 Plan timeframe. ES HVAC savings are projected to increase by 28% from 2017 to 2020. In 2017, HVAC represents a projected 1% of sector savings. This increases to 3% of sector savings in 2020.

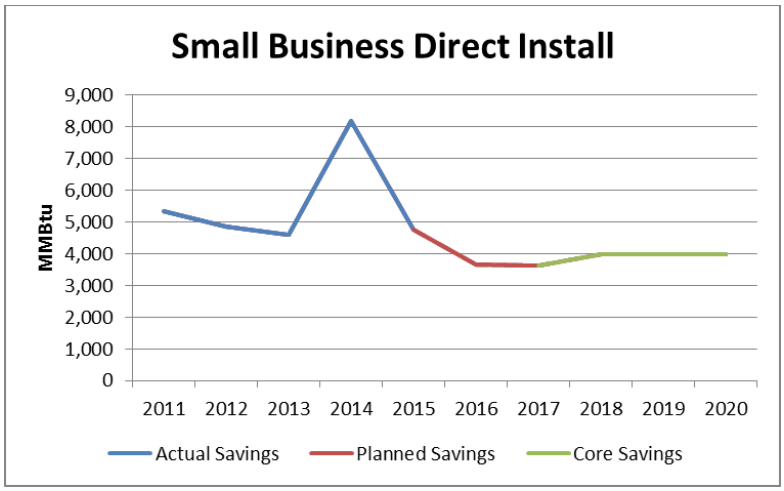
For each of the key ES HVAC Program measures – heat pump water heaters, ductless split heat pumps, and ECM pumps - significant growth in unit numbers is assumed. This growth in unit numbers counteracts the lower NTG ratios that are also assumed, which put a downward pressure on savings. The effects of these two drivers on energy savings lead to a net increase in savings over the 2018-2020 timeframe.

| 2018-2020 Electric HVAC | 2016 Quantity | 2018 Quantity | 2019 Quantity | 2020 Quantity | Kwh/ Unit | 2018 Net MWh | 2019 Net MWh | 2020 Net MWh |
|---|---|---|---|---|---|---|---|---|
| Central Air QIV | 198 | 218 | 240 | 264 | 45.0 | 8.9 | 9.8 | 10.8 |
| Central Air SEER 16.0 EER 13 | 142 | 156 | 172 | 189 | 198.8 | 26.7 | 29.4 | 32.3 |
| Central Air SEER 18.0 EER 13 | 100 | 110 | 165 | 248 | 276.8 | 28.3 | 42.5 | 63.7 |
| Central Air Digital Check-up/Tune-Up | 100 | 110 | 121 | 133 | 64.8 | 6.1 | 6.7 | 7.3 |
| Down Size 1/2 Ton | 20 | 22 | 24 | 27 | 203.0 | 3.8 | 4.2 | 4.6 |
| Duct Sealing | 570 | 627 | 690 | 759 | 212.0 | 113.0 | 124.3 | 136.7 |
| Early Retirement Central Air (Retire) | 9 | 10 | 11 | 12 | 259.0 | 2.2 | 2.4 | 2.6 |
| Early Retirement Heat Pump (Retire) | 9 | 10 | 11 | 12 | 1,189.0 | 10.0 | 11.0 | 12.1 |
| Circulator Pump | 75 | 400 | 600 | 900 | 142.3 | 45.6 | 68.3 | 102.5 |
| Furnace ECM | 0 | 0 | 0 | 0 | 168.0 | 0.0 | 0.0 | 0.0 |
| QI w/ Duct modifications | 0 | 0 | 0 | 0 | 513.0 | 0.0 | 0.0 | 0.0 |
| Heat Pump Quality Installation and Ver | 15 | 17 | 17 | 18 | 308.0 | 4.6 | 4.9 | 5.1 |
| Heat Pump SEER 16.0 EER 12 HSPF | 62 | 78 | 85 | 94 | 450.3 | 32.5 | 35.7 | 39.3 |
| Mini Split HP SEER 18.0 HSPF 9 | 130 | 228 | 303 | 404 | 286.0 | 40.3 | 53.8 | 71.7 |
| Heat Pump SEER 18.0 HSPF 9.6 | 10 | 18 | 23 | 31 | 1,077.8 | 17.5 | 23.4 | 31.2 |
| Mini Split HP SEER 20.0 HSPF 11 | 130 | 228 | 303 | 404 | 330.0 | 78.8 | 105.1 | 140.1 |
| Mini Split Heat Pump QIV | 35 | 44 | 55 | 68 | 113.0 | 4.9 | 6.2 | 7.7 |
| Central Air Digital Check-up/Tune-Up | 22 | 24 | 27 | 29 | 373.4 | 7.7 | 8.4 | 9.3 |
| Heat Pump Water Heater <55 gallon, E | 404 | 606 | 758 | 947 | 1,654.0 | 751.7 | 877.0 | 1,018.0 |
| WiFi Enabled Thermostat with Cooling | 25 | 100 | 133 | 178 | 104.0 | 7.8 | 9.7 | 12.0 |
| WiFi Enabled Thermostat with Cooling | 180 | 700 | 770 | 847 | 104.0 | 54.6 | 56.1 | 57.3 |
| **TOTAL** | | | | | | **1,245** | **1,479** | **1,764** |

## Gas Programs

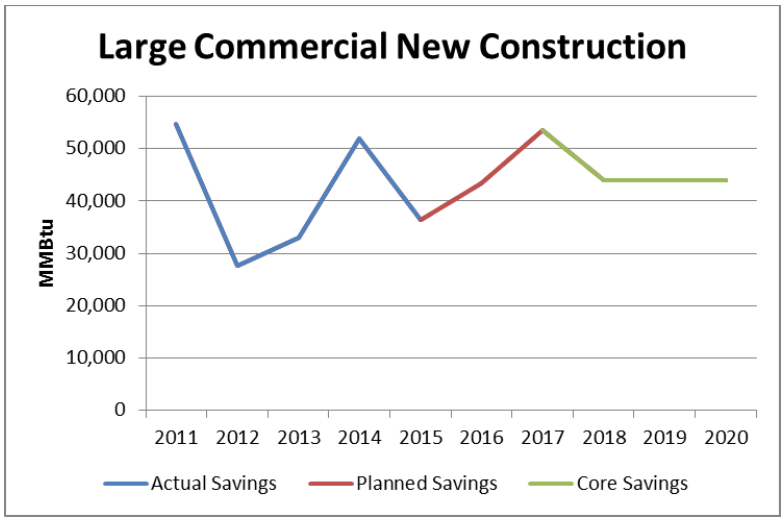
### Commercial and Industrial

**8. Small Business Direct Install program** – provides turnkey services to C&I customers with an average monthly demand of less than or equal to 200 kW, but there is no upper limit of gas consumption that disqualifies a customer from receiving gas measures.



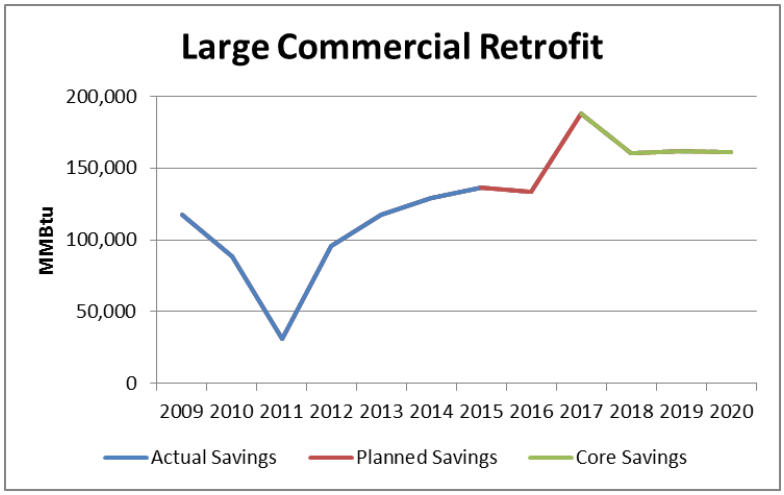
The Small Business program saw a large peak in 2014 that was driven by National Grid's focus on spray nozzles. This measure is near saturation, and low gas costs are inhibiting gas measures overall, thus the expectation is for the savings trend to stay near flat at 2016 levels.

**9. Large C&I New Construction program** – provides services, financing and incentives for new buildings, major renovations and tenant fit-ups, as well as for projects involving "end-of-life replacement" of measures.




Since 2011, Large Commercial New Construction has shown swings in savings from year to year. Because there are a relatively small number of projects completed through this program each year, a couple of large projects can really have an impact on the savings in that year. Due to increasing efficiency levels in building codes, there is a bit of a drop from 2017 to 2018, and then the planned savings are expected to remain relatively flat from 2018-2020.

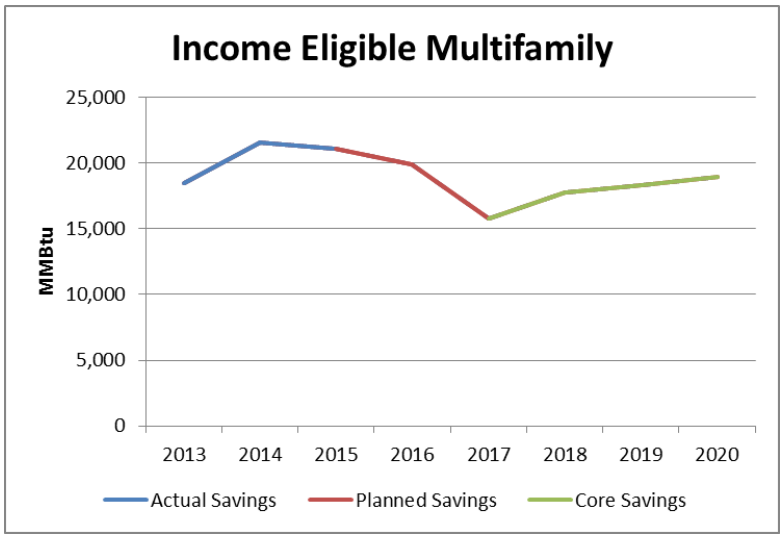
**10. Large C&I Retrofit program** – serves the needs of existing buildings looking to lower energy consumption by providing prescriptive incentives for individual measures or through a custom path involving technical assessments and packaged measures.




Large Commercial Retrofit has shown increased savings since 2011. However, the rate of increase is flattening in part due to low gas prices, which make the payback period for energy efficient projects longer and therefore less attractive. The bump in 2017 is expected from a new measure, laminar flow faucet restrictors, which are expected to have a one year impact due to quick saturation of the market.

## Residential

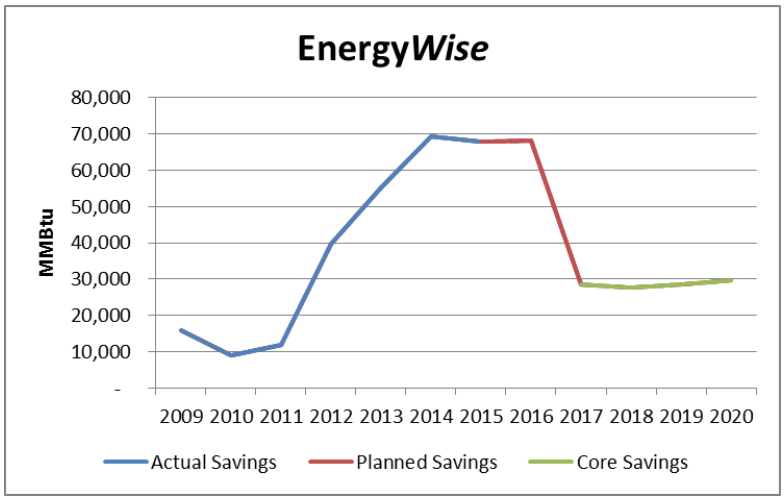
**11. Income Eligible Multifamily program –** provides energy audits, direct install measures and weatherization for 5+-unit buildings, and 1-4 unit buildings connected or neighboring under single ownership group, if at least half the occupants are qualified as income eligible (receive utility service on A-60 rate and/or have incomes less than 60% of Area Median Income).




Grid's Income Eligible Multifamily (IE MF) Program shows an increase in savings from 2017 through 2020. Income Eligible Multifamily savings are projected to grow by 20% from 2017 to 2020. In 2017 IE MF represents a projected 10% of Residential sector savings; which remains unchanged in 2020.

The projected increases in Income Eligible Multifamily savings are from an expected combination of higher program participation, increased conversion rates for key measures like air sealing, programmable thermostats, and custom measures, and from new or underutilized measures like duct sealing.

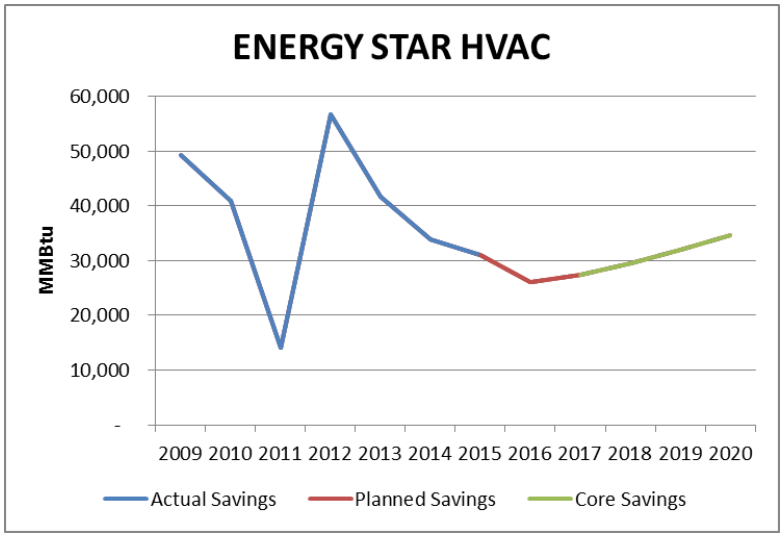
**12. EnergyWise single-family program** -- provides home energy audits for buildings with 1-4 residential units, including direct install of energy saving measures such as low-flow water devices, as well as specifications of weatherization opportunities (insulation and air-sealing) and associated incentives.



EnergyWise, Grid's single family retrofit program, shows a small increase in savings from 2017 through 2020. EnergyWise savings are projected to increase by 4% from 2017 to 2020. In 2017 EnergyWise represents a projected 17% of Residential sector savings. This falls slightly to 16% of sector savings in 2020.

The modest increases in EnergyWise savings are from an expected combination of higher program participation, increased conversion rates for key measures like weatherization, and new or underutilized measures like Wifi thermostats and duct sealing.

**13. Energy Star Water Heating and Heating, Ventilation and Air-conditioning (HVAC) program –** provides prescriptive incentives for qualifying equipment, as well as contractor training and support.




The Gas ENERGY STAR HVAC (ES HVAC) Program, which also includes water heaters, shows a moderate increase in savings over the 2018-2020 Plan timeframe. ES HVAC savings are projected to increase from by 26% from 2017 to 2020. In 2017 ES HVAC represents a projected 17% of Residential sector savings. This increases to 19% of sector savings in 2020.

The ES HVAC savings projections are driven by steadily increasing unit numbers for most key Program measures. Over the three years, projected Program savings are dominated by efficient boilers and combination boiler/hot water systems (44% of savings) and by Wifi thermostats (35% of savings).

RHODE ISLAND FINANCING CONSULTING RETAINER

# OVERVIEW OF ACTIVITIES AND RESULTS

October 31, 2016

## MEMORANDUM

**TO:** State of Rhode Island Energy Efficiency and Resource Management Council (EERMC)

**FROM:** Alex Hill, Senior Consultant and Principal, Dunsky Energy Consulting

**RE:** Overview of 2015-16 Retainer Deliverables

## Introduction

Starting in November 2015 and running through October 2016, Dunsky Energy Consulting (Dunsky) supported the EERMC by providing expertise and input into the use of EE financing in the state. The key objectives of this work were threefold:

1) Contribute to new and emerging financing program offerings
2) Follow up on recommendations made in Dunsky's 2015 memo on EE financing in Rhode Island
3) Provide oversight to National Grid financing programs

This work was led by Alex Hill (Senior Consultant and Principal) with support from Jerome Bilodeau (Consultant), and Martin Poirier (Senior Consultant). The following memo provides an overview of the key activities carried out under the retainer contract, and a description of the major deliverables.

## In-Person Meetings in Rhode Island

During the retainer, Dunsky team members were present on three occasions in Rhode Island to meet with relevant financing program administrators and report to the Council and its Executive Committee. The dates and purposes of these meetings are outlined in the table below.

| Date | Meetings | Purpose | Present |
|---|---|---|---|
| **May 23-25, 2016** | 1. Attend ACEEE Financing Forum (Newport)<br>2. Meeting at RIIB offices<br>3. EERMC Executive | 1. Present RI Financing Landscape<br>2. Discuss RIIB program development (EBF and R-PACE)<br>3. Discuss EE Financing Program Impacts of EE savings reporting | Alex Hill<br>Jerome Bilodeau |
| **July 28, 2016** | 1. Meeting at RIIB offices EERMC Executive | 1. Update on EBF funded projects and 2017 funding request<br>2. Update executive on retainer work progress | Alex Hill |
| **September 8, 2016** | EERMC Meeting | Present Dunsky 2017 EE Plan recommendations and forward looking perspectives | Alex Hill |

Dunsky's retainer covered three key areas, each including the deliverables outlined below. The work plan and priorities evolved throughout the retainer period based on the EERMC's needs, as presented through feedback and instructions provided to Dunsky from the EERMC's Consulting Team (VEIC and Optimal Energy). Thus, the ultimately completed deliverables differ somewhat from those presented in our initial proposal letter, however, the cumulative level of effort remained as proposed.

## Task 1: Contribute expertise to design and implementation of emerging financing program offerings

Over the retainer period, the Rhode Island Infrastructure Bank (RIIB) was actively involved in establishing and researching new EE financing programs. Dunsky maintained regular communication with RIIB through phone calls and in-person meetings at the RIIB offices to track and provide feedback on the RIIB initiatives. The key activities included:

**SUPPORT Efficient Building Fund (EBF):** Dunsky followed the roll-out of the EBF program from the initial call for project proposals, through the project prioritization and selection, and finally to the financing and estimation of program savings.

- As part of this work we gave feedback on the prioritizing of EE projects within the limited $20M financing package (out of $60M in financing application requests) and discussed alternative paths for financing renewable energy projects.
- Dunsky also reviewed the final project list, including gas and electricity savings estimates for each project. This was used as an input into the 2017 EE Plan review and the 2018-2020 three-year plan setting analysis and memo.

**SUPPORT Commercial PACE (C-PACE):** RIIB rolled out a new C-PACE program in early 2016. As part of the program design process Dunsky reviewed the Program Guide and Regulations, providing feedback and recommendations on key program elements such as eligibility criteria and program capitalization. Finally, Dunsky collected information from other C-PACE programs (e.g. C-PACE Connecticut, HERO C-PACE etc.) that can be used to benchmark the program performance and were used to project the program volume and impacts for the 2018-2020 target setting.

**SUPPORT Residential PACE (R-PACE):** RIIB did not release a R-PACE program design within the retainer period. During this time Dunsky communicated with RIIB on a number of occasions to discuss developments related to mortgage lender concerns and federal agency statements related to R-PACE programs.

# Task 2: Follow up on recommendations from Dunsky Study/additional specific areas of investigation

In early 2015, Dunsky prepared a memo containing a range of recommendations for EE financing in Rhode Island. Key among these were:

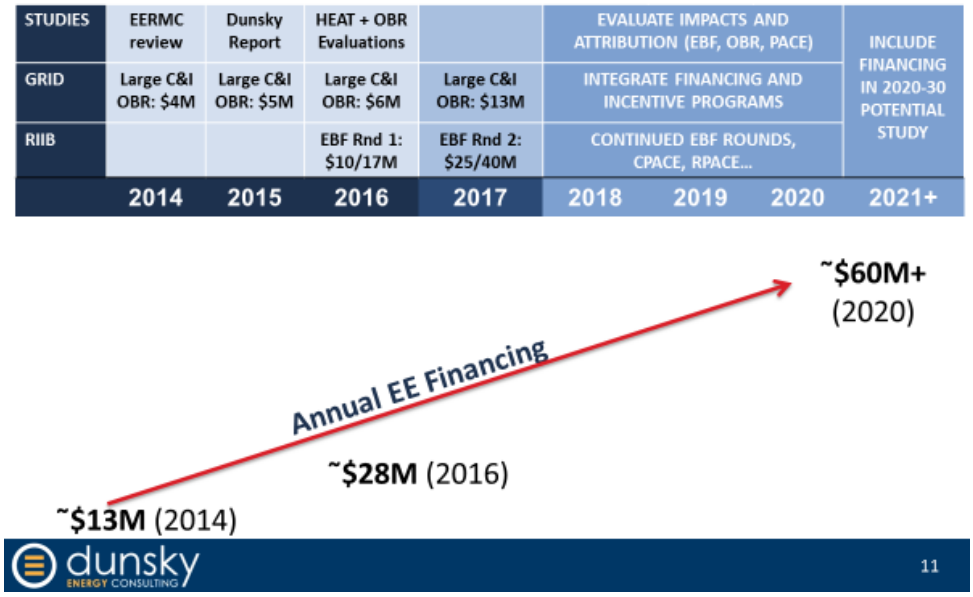
1) Preform strategic evaluations of existing programs and to support new program development
2) Prepare a standard reporting and evaluation framework to track and compare effectiveness and impacts among financing programs and compare with incentive programs.
3) Explore private capital sources to support long-term lending programs that can support deeper savings

The establishment of RIIB and its new EE financing programs, along with National Grid's HEAT Loan and OBR evaluation efforts partially fulfilled these recommended next steps. To support further progress toward these recommendations, Dunsky carried out the following:

**SUPPORT 2017 EE Plan Review:** Dunsky assisted the EERMC's Consulting Team to review the financing program requests and allocations within the 2017 EE Plan. These included allocations for both the OBR revolving loan funds, as well as for the RIIB EBF program. Specifically, this entailed:

- Assessing the projected impact of the requested funds on delivering new energy savings
- Determining the need for these funds considering current balances within each programs (particularly the OBR revolving funds)
- Assessing the market need for each financing program
- Contributing to EE Plan consultation sessions with the C&I Collaborative group and among National Grid, RIIB and Consulting team staff to arrive at a mutually agreeable balance of

**REPORT TO THE EERMC:** During the September 8th EERMC meeting, Dunsky presented a 20-minute overview of the EE financing program allocations within the 2017 Plan, and how they compared with past program volumes and forward looking projections for EE financing in Rhode Island.

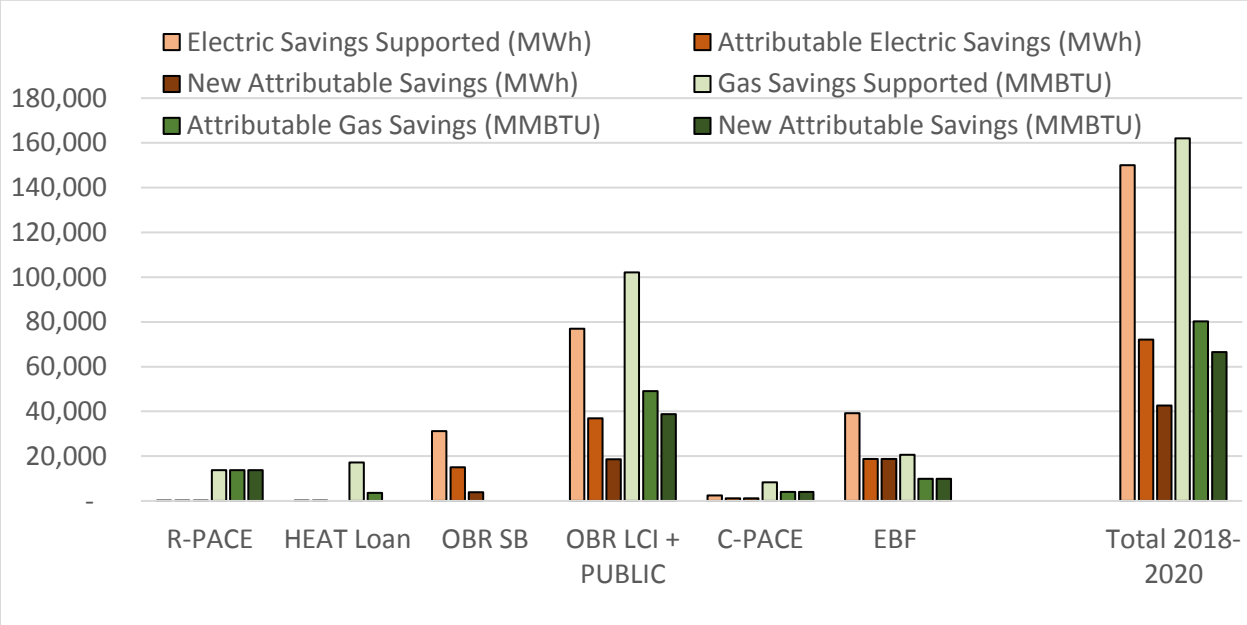


**MEMO EE Financing Program Contributions toward the 2018-2020 Three-year Plan Target Setting:** Given the growing number of EE financing programs offered in Rhode Island, and the overall rise in annual volumes of EE financing delivered, it is becoming increasingly important to assess, predict and evaluate the impact that financing is having in delivering savings. First among these efforts is including the contribution of financing programs to the EE targets set in the 2018-2020 three-year plan.

In October 2016, Dunsky prepared a memo that captures our assessment of the potential impact of the existing and planned EE financing programs over the 2018-2020 period. This work included:

- Reviewing reported financing program volumes and estimating impacts over 2004-2016
- Developing a projection of program trajectories (high, medium and low volume)
- Assessing the links between financing and incentive program delivery
- Preparing a detailed projection identifying the total electricity and gas savings supported and attributable to all RI financing programs,
- Assessing the portion of attributable savings that represents new contributions over and above the 2015 baseline year.
- Based on the above analysis, presented and discussed results with key stakeholders: National Grid, C&I Collaborative, EERMC Executive members, RIIB etc.

**Figure: Total Projected EE Savings from Financing Programs 2018-2020**



# Task 3: Contribute to oversight of National Grid C&I finance offerings

National Grid continues to offer the largest EE financing programs in the state, most notable among these being the commercial OBR programs and the residential 0% interest HEAT loans. In Dunsky's 2015 memo, we recommended that a strategic evaluation of these programs be carried out to understand how well they were responding to market needs, and where adjustments or new offers may help. As part of our efforts under the retainer, Dunsky provided input into the EnergyWise/HEAT loan and the Large Commercial and Industrial (LCI) OBR program process evaluations.

**SUPPORT OBR Program Process Evaluation:** In the Summer of 2016, National Grid undertook a process evaluation of the Large Commercial and Industrial (LCI) sector OBR program for electric savings, that aimed to explore the nature of the savings measures supported, assess the influence of the OBR financing offer on customer decision-making, and determine to what degree the program applies successful practices as noted from other best in class programs. To support and interpret the results from this evaluation, Dunsky:

- Provided input into the LCI OBR process evaluation RFP
- Provided input into customer survey guide
- Provided feedback on LCI OBR process evaluation report
- Prepared memo on LCI OBR program process evaluation results interpretation

**MEMO Interpretation of LCI OBR Program Process Evaluation Results:** Based on Dunsky's read of the overall evaluation report, we prepared a memo outlining our interpretation of the key findings:

1. **The report indicates that the LCI OBR may not be contributing to a number of the EERMC's goals:** The LCI OBR program has not demonstrated success in either supporting deep savings (beyond lighting measures) or reducing the incentive cost of savings, which have been rising steadily for OBR supported projects.
2. **An integrated approach among OBR, C-PACE and EBF is needed to optimize savings:** Despite being referred to as the LCI OBR program, the Cadmus report indicates that over the 2015-2016 period over 67% of the OBR loan funds were directed at the Government and MUSH segments. This suggests that this program may be largely missing its target market and instead competing for opportunities with RIIB's EBF program.
3. **The need for further near-term injections to the LCI OBR Revolving Fund does not appear to be supported:** The report recommends that injections be planned over the coming years, however, this conclusion is not supported by the more realistic annual growth projections.

**SUPPORT HEAT Loan Evaluation:** As part of the EnergyWise program process evaluation, National Grid undertook an evaluation of the HEAT Loan program. Dunsky supported and interpreted the results from this evaluation the following:

- Reviewed the Massachusetts HEAT Loan evaluation
- Provided input into the RI EnergyWise/HEAT Loan evaluation research plan
- Provided feedback and interpretation of HEAT loan evaluation results

**INPUT Standardizing Financing Program Results Reporting:** Throughout the course of the retainer, Dunsky reviewed and discussed results reporting documents from RIIB and National Grid. On several occasions, we noted inconsistencies and made suggestions of ways to improve the relevance and accuracy of financing program results reporting. Toward the end of the current engagement, efforts began to create an improved and consistent results reporting model that RIIB and National Grid can both apply. We anticipate that in the coming months a system will be developed that meets both lenders' reporting needs.

# Conclusion – Next Steps

Upon completion of the above deliverables, Dunsky prepared a proposal to the Council to support its on-going efforts to improve the effectiveness of EE financing programs in 2017. Under these efforts, we have proposed to undertake the following tasks and activities.

**Task 1: Contribute expertise to design and implementation of the emerging financing program offerings**

- Assist EERMC and consultant team to situate EE Financing in the 2018-2020 three-year plan
- Review EE financing components of 2018 EE Plan
- Perform a high-level assessment of new opportunities for EE Financing in multi-family buildings

**Task 2: Follow up on recommendations from Dunsky Study/additional specific areas of investigation**

- Make recommendations and input into consistent reporting standards for RIIB and National Grid EE financing programs:
- Track RIIB progress and programs (EFB, C-PACE, R-PACE, other new offerings)

**Task 3: Contribute to oversight of National Grid C&I finance offerings**

- Perform a final review of the OBF Evaluation Report and EnergyWise/HEAT Loan Evaluation Reports (Final Drafts – when available)
- Recommend and assist in the scoping of further evaluation efforts
- Work with NGRID Staff to explore options to integrate OBF financing with incentive delivery to support flexibility in incentive levels

These tasks represent, as a whole, a continuation of the work performed in 2016, and aim to assist the ERRMC to ensure that the recommendations adopted by the council are implemented.

# FINANCING PROGRAM CONTRIBUTIONS

October 18, 2016

## MEMORANDUM

**TO:** State of Rhode Island Energy Efficiency and Resource Management Council (EERMC)

**FROM:** Alex Hill, Senior Consultant and Principal, Dunsky Energy Consulting

**RE:** Assessing financing program contribution to efficiency targets in the 2018-2020 three-year plan

## CONTEXT: THE IMPACT OF FINANCING ON ENERGY EFFICIENCY TARGET SETTING

This document offers thoughts on the development of a methodology to assess the **contribution of financing programs toward energy efficiency (EE) target setting**, in the context of the Rhode Island Energy Efficiency and Resource Management Council's (EERMC) efforts in the state.

Currently energy efficiency targets in Rhode Island are proposed triennially to the Public Utilities Commission. In consideration of the target-setting methodology for the 2018-2020 period, we offer the following proposed additions related to EE financing programs that are currently operating or planned to be established over the 2018-2020 period.

### BASIS: EE FINANCING PROGRAMS IN RHODE ISLAND

The EE financing program offering in the state of Rhode Island is growing, with the following programs for various market segments:

**Residential**

- HEAT loans (National Grid): for single family home HVAC and weatherization improvements

**Non-residential**

- On-Bill Repayment Program (National Grid): For Small Business, Larger Commercial and Industrial (LCI) and Public Buildings Retrofits
- C-PACE (RIIB): For commercial building retrofit and certain new construction projects.

**Government buildings**

- Efficient Building Fund (RIIB): For municipal facilities upgrades

Other potential or pending programs that have been identified include:

- Residential-PACE (RIIB): enabling legislation is in place and a program is planned to be established in 2017
- Multi-family: The one sector not currently served specifically is multi-family buildings, there may be opportunities to develop a financing initiative for this specific and unique sector.

Some of the programs above include financing for renewable energy and efficiency projects. For the purpose of the analysis presented here, **only the portion of the program financing directly applicable to electricity and gas efficiency is considered**.

## **IMPACT:** ASSESSING NEW SAVINGS FROM FINANCING PROGRAMS

This memo seeks to quantify the degree to which EE financing programs may unlock savings that would not otherwise have been captured in the energy efficiency incentive program targets for the 2018-2020 period. Because many of the financing programs have existed for a number of years, and work in concert with other utility incentive programs, it is assumed that some portion of the savings supported by financing programs is already included within the incentive program targets.

**Key Assumptions**

We therefore seek to identify new savings that can be specifically attributed to financing programs by applying the follow assumptions:

- **2015 is the Baseline Year**: All savings supported by financing programs in 2015, whether attributable to financing or incentives, are already captured in past target-setting. Thus 2015 will act as the baseline year.
- **New programs and volume support new savings:** New financing programs and increased financing volumes in existing programs above and beyond 2015 levels may contribute to potential increases in efficiency targets.
- **Financing Attributable Savings:** Only savings considered to be attributable to financing (a portion of the overall savings supported[1] by financing) will contribute to potential increases in efficiency targets.
- **Stable Energy Savings Costs:** Past program incentive cost per kWh or MMBTU of savings are indicative of future incentive costs of savings within given financing programs.
- **Programs Models Largely Constant:** While there may be adjustments to incentive and financing programs, and how they are integrated, it is assumed that over the 2018-2020 period the financing programs will benefit from being delivered alongside similar incentive programs as in 2015/2016.

**Steps to Assess Additional Savings**

Based on the above assumptions, we determined the potentially increased impacts of financing program by the following steps:

**Step 1:** Determine the amount of financing delivered and supported savings in 2015

[1] Supported savings refers to all net savings resulting from projects that receive financing within a given program. Financing can both encourage projects that would not happen in the absence of financing (i.e. through available incentives alone) and help "sell" incentivized savings projects by improving the business case to the participants. Each of these has a degree of influence over the participants' decision to move ahead with their efficiency project. The degree on average to which the financing offered influenced the participants' decision to move ahead with the projects, relative to the influence of the available incentives, is the attribution ratio. By applying this ratio to the overall savings "supported" by the program we can estimate the portion of the savings that are attributable to the financing relative to the incentives.

**Step 2:** Project future financing volumes based on past program trajectories, new program plans, and other market factors.

**Step 3:** Determine the amount of savings attributable to financing in each year of the next target period (2018-202) and subtract financing attributed savings in the baseline year (2015) to arrive at the projected additional financing impact in each year.

# **PROGRAM** SIZE AND IMPACT PROJECTIONS 2018-2020

Based on the methodology that follows, we predict the supported and attributable savings (presented in the tables below) for each of the currently operating and planned EE financing programs in Rhode Island over the 2018-2020 period.

### Table 1: Total Loan Volume and Savings Projections

| | | PROGRAM | Financing Attribition | Annual Loan Volume | Electric Savings Supported (MWH) | Gas Savings Supported (MMBTU) | Attributable Electric Savings (MWh) | Attributable Gas Savings (MMBTU) | New Attributable Electric Savings (MWh) | New Attributable Gas Savings (MMBTU) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | Res. | R-PACE | 100% | $0 | - | - | | | | |
| | | HEAT Loan | 21% | $6,008,516 | 28 | 5,716 | 6 | 1,200 | | |
| | Non-Res. | OBR SB | 48% | $1,726,032 | 7,704 | | 3,698 | - | | |
| | | OBR LCI + PUBLIC | 48% | $5,388,282 | 12,753 | 7,073 | 6,121 | 3,395 | | |
| | | C-PACE | 48% | $0 | | | | | | |
| | | EBF | 48% | | | | | | | |
| | | ***Total 2015*** | | ***$13,122,830*** | ***20,484*** | ***12,789*** | ***9,825*** | ***4,596*** | | |
| 2018 | Res. | R-PACE | 100% | $2,500,000 | 31 | 4,596 | 31 | 4,596 | 31 | 4,596 |
| | | HEAT Loan | 21% | $6,000,000 | 28 | 5,716 | 6 | 1,200 | - | - |
| | Non-Res. | OBR SB | 48% | $1,573,000 | 9,448 | | 4,535 | - | 837 | - |
| | | OBR LCI + PUBLIC | 48% | $9,677,262 | 21,154 | 28,058 | 10,154 | 13,468 | 4,033 | 10,073 |
| | | C-PACE | 48% | $2,500,000 | 940 | 3,210 | 451 | 1,541 | 451 | 1,541 |
| | | EBF | 48% | $22,500,000 | 13,068 | 6,869 | 6,273 | 3,297 | 6,273 | 3,297 |
| | | ***Total 2018*** | | ***$44,750,262*** | ***44,668*** | ***48,448*** | ***21,449*** | ***24,102*** | ***11,624*** | ***19,506*** |
| 2019 | Res. | R-PACE | 100% | $2,500,000 | 31 | 4,596 | 31 | 4,596 | 31 | 4,596 |
| | | HEAT Loan | 21% | $6,000,000 | 28 | 5,716 | 6 | 1,200 | - | - |
| | Non-Res. | OBR SB | 48% | $1,730,300 | 10,393 | | 4,988 | - | 1,291 | - |
| | | OBR LCI + PUBLIC | 48% | $11,612,715 | 25,385 | 33,670 | 12,185 | 16,161 | 6,063 | 12,766 |
| | | C-PACE | 48% | 1,500,000 | 564 | 1,926 | 271 | 924 | 271 | 924 |
| | | EBF | 48% | $22,500,000 | 13,068 | 6,869 | 6,273 | 3,297 | 6,273 | 3,297 |
| | | ***Total 2019*** | | ***$45,843,015*** | ***49,468*** | ***52,776*** | ***23,753*** | ***26,179*** | ***13,928*** | ***21,583*** |
| 2020 | Res. | R-PACE | 100% | $2,500,000 | 31 | 4,596 | 31 | 4,596 | 31 | 4,596 |
| | | HEAT Loan | 21% | $6,000,000 | 28 | 5,716 | 6 | 1,200 | - | - |
| | Non-Res. | OBR SB | 48% | $1,903,330 | 11,432 | | 5,487 | - | 1,790 | - |
| | | OBR LCI + PUBLIC | 48% | $13,935,258 | 30,462 | 40,404 | 14,622 | 19,394 | 8,500 | 15,999 |
| | | C-PACE | 48% | 2,500,000 | 940 | 3,210 | 451 | 1,541 | 451 | 1,541 |
| | | EBF | 48% | $22,500,000 | 13,068 | 6,869 | 6,273 | 3,297 | 6,273 | 3,297 |
| | | ***Total 2020*** | | ***$49,338,588*** | ***55,960*** | ***60,794*** | ***26,869*** | ***30,028*** | ***17,044*** | ***25,432*** |

## KEY TAKE-AWAYS

1) **The mix of EE financing offers is growing and expanding**. By 2020, EE financing may approach $50M in loans, as compared to $13M in 2015. Within that mix will be as many as seven programs serving a variety of market sectors. In some sectors, multiple programs may offer financing to the same customer segments, such as R-PACE and HEAT Loans for homeowners, and C-PACE and OBF for commercial properties.

**Figure 1: EE Financing Offer Mix 2015 and 2020**

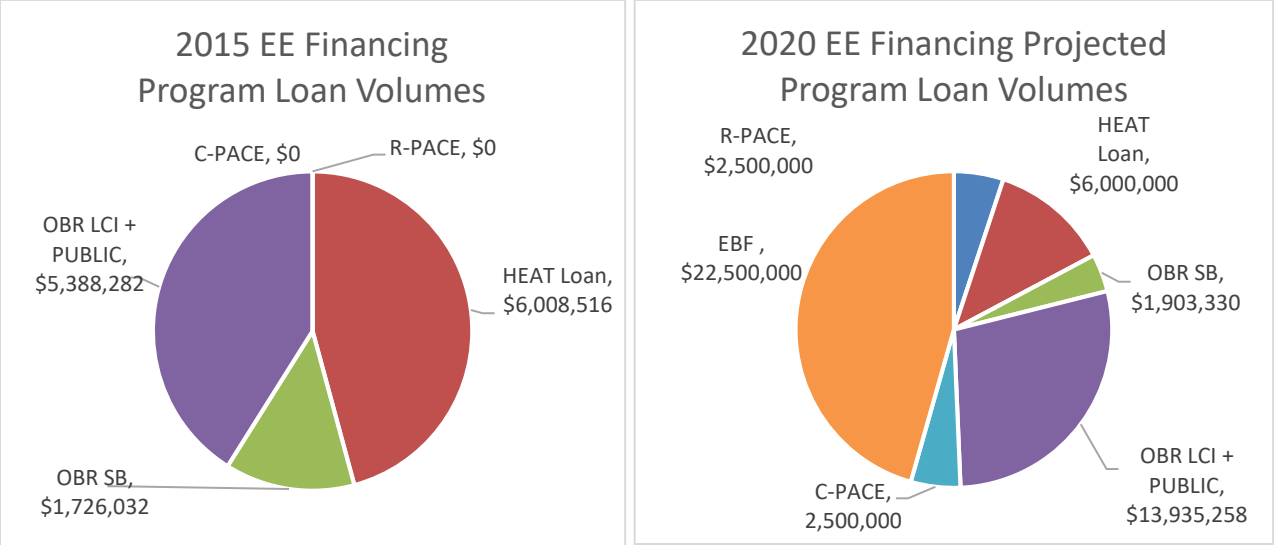
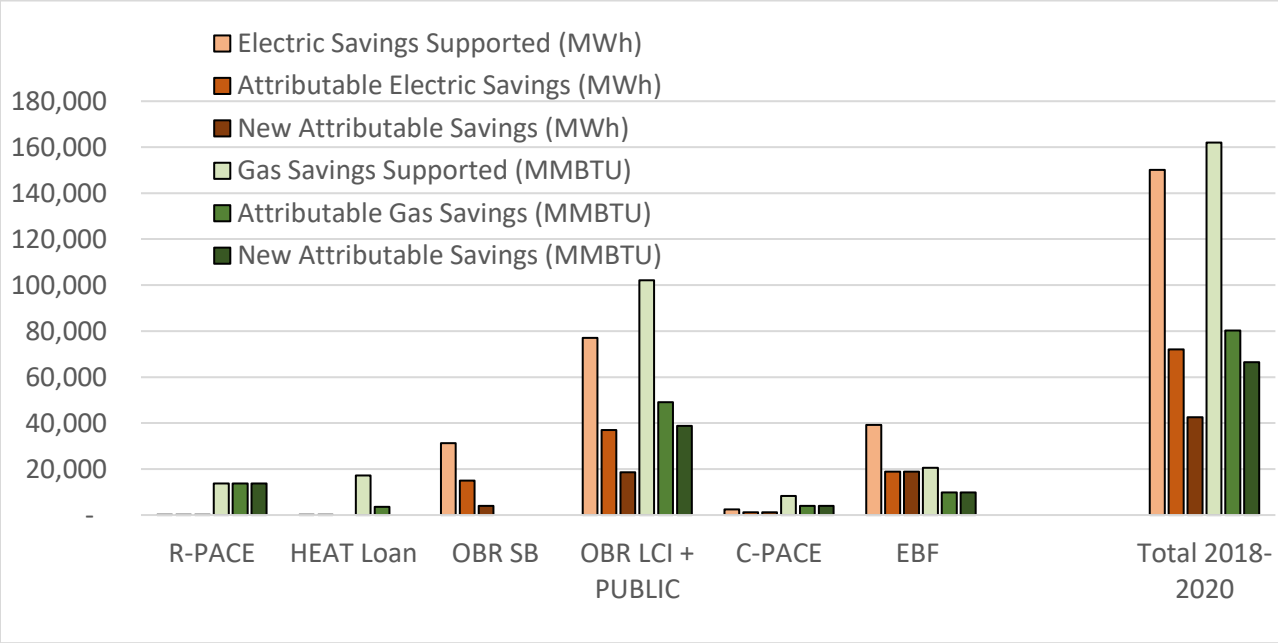



**Figure 2: Total Projected EE Savings from Financing Programs 2018-2020**



2) **The bulk of new savings appear to be connected to the OBR programs:** Assuming that the OBR programs can grow at a similar pace to the past few years, the OBR programs will likely be the largest source of new savings through financing. However, for this to happen these programs will likely need to transform from predominantly lighting focused during the 2018-2020 period.

3) **Longer-term financing programs may offer more significant life-time savings:** PACE programs and EBF can offer financing for with 15 years or longer tenors. This is well-suited to deeper savings upgrades that may deliver greater life-time savings. Figure 2 above indicates only the annual savings in the year that the financing is delivered. Moreover, the PACE and EBF programs include significant renewable energy financing components that are not captured within the loan volumes or resulting savings shown above.

4) **Residential programs will likely deliver greater amounts of gas and oil savings, while offering minimal electrical savings:** Based on the heating fuel mix in Rhode Island and the results from the HEAT loan program, there appears to be little opportunity to financing electric savings in the residential sector. Moreover, financing programs like R-PACE may be used by residential customers to support fuel switching to ground source, or high-efficiency mini-split heat pumps that could result in a net increase in electricity consumption

# **METHODOLOGY:** LOAN VOLUME AND SAVINGS PROJECTIONS

A description of the key factors and methods applied to determine projected program volumes and energy savings is provided below for each program.

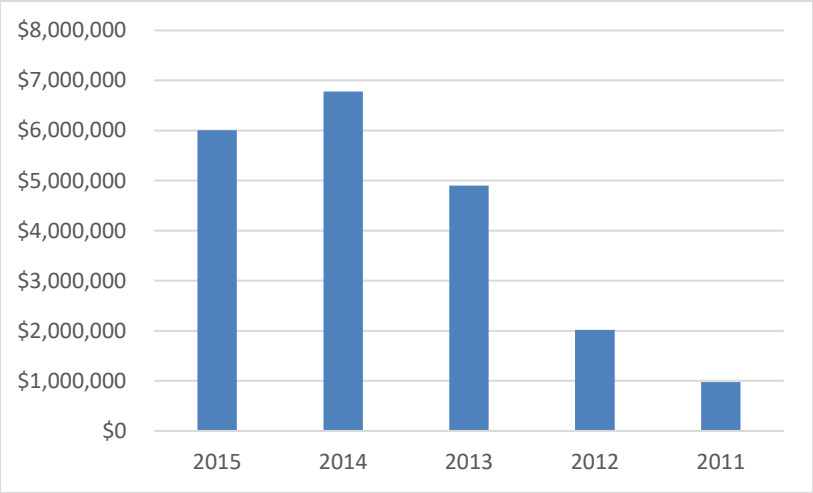
## HEAT LOAN

HEAT Loan volumes and savings are estimated from historical program data found in National Grid's EE Program Year-End Reports, the National Grid Rhode Island EnergyWise Single Family Process Evaluation, (Draft Report, RIA, August 2, 2016), and the EnergyWise Impact Evaluation of 2014 EnergyWise Single Family Program (DNV-Kema, August 16, 2016)

**Annual Loan Volume (2018 – 2020): $6M per year - stable**

Based on the trend in HEAT loan volumes to 2015, it appears that the annual volume has leveled off over 2013-2015 at an average approaching $6M per year. Thus, the HEAT Loan volume is assumed to remain stable at $6M per year over the 2018-2020 period.

**Figure 3: HEAT Loan Volumes (From EE Program Year-End Reports)**




Factors that could influence the HEAT loan volume in the 2018-2020 period include:

- Factors that could increase HEAT loan volume
  - Rising energy costs (gas and oil in particular)
- Factors that could decrease HEAT loan volume
  - Competition with an eventual R-PACE program
  - Increase in market interest rates that may reduce lender willingness to offer loans
  - Maturation of the residential weatherization and heating equipment markets
  - Further decreases in oil and gas prices

**Savings Estimates: Weatherization**

Results in from the 2014 EnergyWise Impact Evaluation reveal the following breakdown of energy savings for weatherization related projects.

**Table 2: Ex-post 2014 HEAT Loan Supported Savings by Fuel Type**

| | Electricity | Gas | Oil |
|---|---|---|---|
| **Average Savings per Unit Household[2]** | 383.9 kWh | 90.7 therms | 14 MMBTU |
| **Weatherization Portion of Program Savings by Fuel type[2]** | 7.2% | 95% | 100% |
| **HEAT Loans Contributing to Savings[3]** | 848 | 401 | 308 |
| **Weatherization Savings Supported by HEAT** | 22,722 kWh | 34,484 therms | 4,311 MMBTU |

For the Energy Star HVAC program, the annual savings per participant were estimated from the 2014 Year End Report values, and the portion of program participants that used a HEAT loan was taken from values presented in the EnergyWise Process Evaluation report (RIA 2016). The resulting estimated savings supported values are presented in the table below.

**Table 3: Energy Star HVAC Program Volumes and Supported Savings 2014**

| | Electricity | Gas |
|---|---|---|
| **Energy Star HVAC Savings** | 1,639 MWh | 33,962 MMBTU |
| **Energy Star HVAC Participants** | 2,445 | 3,037 |
| **HEAT Loans for HVAC (2014)** | 7 | 203 |
| **Savings per participant** | 670 kWh | 112 therms |
| **HEAT Loan Supported Savings** | 4,854 kWh | 22,675 therms |

**Attribution of Savings to HEAT Loans: Estimated as 21% of EnergyWise Weatherization and Energy Star HVAC savings on a per project supported basis.**

Based on the average value of weatherization project value and for HEAT Loan and non-HEAT Loan participants in the EnergyWise program[4], we determined that the HEAT loans supported a 21% increase in the overall investment in weatherization projects, and thus we interpret this to translate into 21%

[2] DNV-Kema 2016

[3] 85% of HEAT Loan participants reported doing weatherization and 36% reported doing HVAC improvements (RIA 2016)

[4] Table 6-2 in the EnergyWise Process Evaluation (RIA, August 2016)

increase in weatherization savings as compared to the EnergyWise program average being attributable to the HEAT loan.

In the absence of data about the HEAT loan from the EnergyStar HVAC program, we applied the assumption that the HEAT loan would lead to the same 21% attribution of savings within for HEAT/HVAC participants, as was assessed for the EnergyWise participants. The number of HEAT/HVAC participants in 2015 was determined from the fuel type and loan usage survey results presented in the HEAT loan process evaluation (RIA 2016).

## RESIDENTIAL PACE

The residential PACE (R-PACE) program has not yet been designed or approved, although enabling legislation is in place. We modelled the potential program size and impacts based on the results presented in the report titled "Evaluation of The Efficiency Maine Trust PACE, Powersaver, and RDI Programs Final Evaluation Report Volume I: Pace & Powersaver Loan Program 2013" Opinion Dynamics Corporation (ODC) and Dunsky Energy Consulting, October 23, 2013.[5]

**Estimated Annual Loan Volume (2018-2020): $2.5M**

The PowerSaver and PACE Maine loans are both long term loans that support deep energy retrofits, and for this analysis we applied the total loan volume for the programs combined as a conservative estimate for R-PACE volume in Rhode Island.

**Estimated Savings**

Based on the same overall loan volume, the annual savings were assumed to be equivalent to the PACE Maine program at 10,445 mmbtu per year when all fuels are taken together. The breakdown among savings by fuel type are projected based on the HEAT Loan savings ratios by fuel type presented above, which likely provides a more appropriate heating fuel mix for Rhode Island than the PACE Maine results.

**Table 4: PACE Maine and Rhode Island R-PACE Program Volume and Savings**

| | Maine | Rhode Island |
|---|---|---|
| **Program Size (Loan Volume)** | $2.5 M<br>(PACE and PowerSaver) | $2.5 R-PACE (projected) |
| **Population 2015** | 1.3M | 1.05M |
| **Annual Program Savings** | 10,445 MMBTU | 10,445 MMBTU |
| **Electricity Savings** | n/a | 31 MWh (1% of program savings) |
| **Gas Savings** | n/a | 4,596 MMBTU (44% of program savings) |
| **Oil Savings** | n/a | 55% of program savings |

[5] Link to source: http://www.neep.org/sites/default/files/resources/PACE-Final-Evaluation-Report-FINAL.pdf

Factors that could influence the R-PACE loan volume in the 2018-2020 period include:

- Factors that could decrease loan volume
    - Maine Results include PowerSaver loan volumes that are based on different underwriting criteria than PACE which may expand eligibility
    - PowerSaver loans supported project with up to $25,000 in value, R-PACE may have a lower project value limit
    - Competition with HEAT Loans, if the program remains, particularly if the 0% interest offer is maintained for HEAT Loans
- Factors that could increase loan volume
    - PACE Maine customers did not benefit from incentives such as the EnergyWise and Energy Star HVAC programs
    - PACE Maine is run by the state energy efficiency agency and has relatively strict project requirements, use of a 3rd party provider model such as the HERO model in California

**Attribution of Savings: 100% Financing**

It is assumed that these savings are 100% new savings that would not have occurred without the R-PACE program. The PACE Maine program was delivered in the absence of utility incentive programs for residential customers, thus all uptake was attributable to the financing. In Rhode Island the EnergyWise and Energy Star HVAC programs will likely continue to offer incentives that improve the business case for residential program upgrades. This may lead to significantly higher R-PACE program volume than the $2.5M per year projected here, however, much of the increased savings supported by R-PACE would be attributable to the incentives, and thus we assume that the total amount of savings attributable to the financing will remain nearly the same.

## ON-BILL REPAYMENT (OBR) PROGRAMS

For the OBR programs it was assumed that the programs would expand in a similar fashion to the historical trends over the past 5-7 years. It was also assumed that:

- In all cases OBR revolving funds would be sufficient to meet need in each year regardless as to previous year-end balance (i.e. fund injections would be made as needed)
- The 48%-52% Financing-Incentive attribution ratio and combined program 7% Free Ridership presented in the LCI OBR Process Evaluation report (Cadmus 2016) are applicable across all OBR programs over the period being assessed.[6]

## LARGE COMMERCIAL AND INDUSTRIAL (LCI) OBR

National Grid operates three revolving funds to support its LCI OBR program, with the LCI electricity OBR Fund being by far the largest:

1) **LCI Electricity OBR Fund:** $18M in Fund deposits through 2016
2) **LCI Gas OBR Fund:** $1.8M in Fund deposits through 2016

[6] While the Cadmus report does provide an attribution estimate, the report clearly states that this was not derived with the level of rigor required to perform a net-savings analysis on the OBR program. Thus while the 48% savings attribution for financing is applied for the purposes of target setting, it is not intended to be applied for future net-savings analysis.

3) **Public Buildings Fund:** $1.3M in Fund deposits through 2016

These three funds were considered in aggregate for the 2018-2020 savings estimates presented below.

**Estimated LCI Loan Volumes 2018-2020**

Based on the 2012-2015 loan volume data an annual year over year (YOY) growth of 20% was projected for the 2018-2020 period (see table below). This trend recognizes National Grid's intention to grow the funds' use and impact, and the potential interest to use financing as a tool to reduce the costs of savings. Despite a more varied trend for the Gas OBR program volumes, due to the limited historical data, the same 20% growth trend was projected for Gas OBR as was observed for Electricity OBR.

**Table 5: LCI and Public Building Electricity OBR Historical and Projected Loan Volume and Savings**

| Year | Loans Made / Projected | Associated Incentives | OBR YOY growth | OBR Supported Savings (MW) | Cost per kWh Savings | Attributable savings (MWh) |
|---|---|---|---|---|---|---|
| **2012** | $2,833,498 | $2,472,199 | - | 9,604 | $0.26 | 4,287 |
| **2013** | $3,392,512 | $2,088,311 | 20% | 9,065 | $0.23 | 4,047 |
| **2014** | $4,069,143 | $3,062,229 | 20% | 9,022 | $0.34 | 4,027 |
| **2015** | $4,930,123 | $4,431,358 | 21% | 12,753 | $0.35 | 5,693 |
| **2016** | $5,720,321 | $5,141,614 | 16% | 14,690 | $0.35 | 6,558 |
| **2017** | $6,864,385[7] | $6,169,937 | 20% | 17,628 | $0.35 | 7,869 |
| **2018** | $8,237,262 | $7,403,924 | 20% | 21,154 | $0.35 | 9,443 |
| **2019** | $9,884,715 | $8,884,709 | 20% | 25,385 | $0.35 | 11,332 |
| **2020** | $11,861,658 | $10,661,651 | 20% | 30,462 | $0.35 | 13,598 |

[7] At the time of writing National Grid projects $9,000,000 in Electricity OBR loan volume for 2017, however, in past years EE Plan OBR program volumes have significantly over estimated results, and thus this analysis estimates that the 20% YOY growth will be maintained resulting in a lower loan volume in 2017.

**Table 6: LCI Gas Historical and Project Program Volume and Savings**

| Year | Loans Made / Projected | Associated Incentives | OBR YOY growth | OBR Supported Savings (Therms) | Cost per therm Savings | Attributable savings (Therms) |
|---|---|---|---|---|---|---|
| **2015** | $458,159 | $160,813 | | 70,733 | $2.27 | 33,952 |
| **2016**[8] | $910,646 | $414,158 | 99% | 182,166 | $2.27 | 87,440 |
| **2017** | $1,200,000 | $545,756 | 32% | 240,049 | $2.27 | 115,223 |
| **2018** | $1,440,000 | $654,907 | 20% | 288,058 | $2.27 | 138,268 |
| **2019** | $1,728,000 | $785,888 | 20% | 345,670 | $2.27 | 165,922 |
| **2020** | $2,073,600 | $943,066 | 20% | 414,804 | $2.27 | 199,106 |

**Attributable Savings: 48%**

Total program savings are estimated assuming that ratio of financing to incentives will remain stable at the average value from the 2012-2016 results, and that the cost of savings will remain stable at 2015 values. The savings attributable to the financing relative to the incentive are considered to be 48% of the net combined financing and incentive program savings after a 7% free ridership is removed, as per the LCI OBR process evaluation results (Cadmus 2016).

## SMALL BUSINESS (SBS) ELECTRICITY OBR

Projections for the SBS OBR program were made based on reported program data from National Grid staff the 2017 EE Plan and recent EE program Year-End Plans.

**Estimated SBS Loan Volumes 2018-2020**

Despite the declining SBS OBR program volumes in 2014-2016, we have assumed that National Grid's 2017 target indicates an intention to increase SBS OBR program volumes, and that the program would grow at 10% per year, about half the pace assumed for the LCI program growth. This growth rate assumes that National Grid will use the SBS financing to encourage deeper energy savings and explore options to apply OBR as a tool to reduce the cost of savings.

[8] Data for 2016 was extrapolated from partial-year data provided by National Grid staff.

**Table 7 SBS Historical and Project Program Volume and Savings**

| Year | Loans Made / Projected | Associated Incentives | OBR YOY growth | OBR Supported Savings (MWh) | Cost per kWh Savings | Attributable savings (MWh) |
|---|---|---|---|---|---|---|
| **2012** | $2,397,622 | $8,474,269 | - | 19,586 | $0.43 | 8,743 |
| **2013** | $3,126,662 | $9,663,312 | 30% | 21,358 | $0.45 | 9,5341 |
| **2014** | $2,573,272 | $8,983,013 | -18% | 18,089 | $0.50 | 8,074 |
| **2015** | $1,726,032[9] | $4,567,262 | -33% | 7,704 | $0.59 | 3,438 |
| **2016** | $1,300,000 | $4,629,151 | -25% | 7,808 | $0.59 | 3,485 |
| **2017** | $1,430,000 | $5,092,066 | 10% | 8,589 | $0.59 | 3,834.09 |
| **2018** | $1,573,000 | $5,601,273 | 10% | 9,448 | $0.59 | 4,217.50 |
| **2019** | $1,730,300 | $6,161,400 | 10% | 10,393 | $0.59 | 4,639.25 |
| **2020** | $1,903,330 | $6,777,540 | 10% | 11,432 | $0.59 | 5,103.17 |

**Attributable Savings: 48%**

Total program savings are estimated assuming that ratio of financing to incentives will remain stable at the average value from the 2012-2016 results, and that the cost of savings will remain stable at $0.59 per kWh. The saving attributable to the financing relative to the incentive are considered to be 48% of the net combined financing and incentive program savings after a 7% free ridership is removed.

## EFFICIENT BUILDING FUND (EBF)

The first round of EBF successfully delivered over $17M in loans for EE and Renewable energy projects to municipal facilities in 2016, 60% of which was dedicated to EE projects (85% for electricity saving measures and 15% for gas).

**Estimated EBF Loan Volumes 2018-2020: $22.5M per year**

Based on a $7.5M combined injection of ratepayer and public funds into the program and an assumed private capital leveraging ratio of 5:1, the second round of EBF is projected to support $37.5M in loans to municipal facilities. It is assumed that EBF will be able to maintain the equivalent loan volume in each year (as RIIB builds the EBF revolving funds) while delivering 60% of the loans to support EE savings, as per Round 1. This would result in $22.5M in EE loans in each year for 2018-2020.

[9] This value was presented in the 2015 Year-End report, however, National Grid staff reported over $3.5M in SBS OBR loan volume in 2015. At the time of writing the discrepancy in the reported program volumes has not been rectified.

**Table 8: EBF Program Volume and Estimated Savings**

| | Total Loan Volume | EE Loans | Total Electricity Savings (MWh) | Total Gas Savings (Therms) |
|---|---|---|---|---|
| **Round 1 (2016)** | $17M | $10M (60%) | 6,000 | 31,500 |
| **Round 2 (2017)** | $37.5M | $22.5M (60%) | 13,000 | 68,700 |

**Attributable Savings: 48%**

Similar to the LCI OBR loans, we have applied the 48% attribution portion to the EBF savings because they also receive support through National Grid incentive programs.[10]

## COMMERCIAL PACE

RIIB established a commercial PACE (C-PACE) program in 2016, that finances energy upgrades through private capital. No formal targets or projections for this program have been established.

**Estimated Total Savings Supported**

C-PACE program volume in Rhode Island was projected from historical loan volume data from another state-wide C-PACE program, and prorated based on the relative GDP of the two states, which is taken as a surrogate for the commercial building market size. A broad assumption is made that these savings are made up equally between gas and electricity. Further assuming that the savings supported per dollar invested is the same between the two programs, annual electricity and gas savings are projected for C-PACE Rhode Island.

**Table 9: C-PACE (Other State) and Rhode Island C-PACE Estimated Program Volume and Savings**

| | Other State | Rhode Island |
|---|---|---|
| **C-PACE Loan Volume (EE only, 2015)** | $11M / year | $2.5M / year (est.) |
| **Annual Total EE Savings (Gas and Electric)** | 39,000 MMBTU[11] | 6,400 MMBTU |
| **Electricity Savings (50%) per $1M of C-PACE activity** | 376 MWh | 376 MWh |
| **Gas Savings (50%) per $1M of C-PACE activity** | 1,283 MMBTU | 1,283 MMBTU |

[10] The EBF savings are expressed in gross savings, whereas other program savings are net.

[11] All other state C-PACE program savings are reported in MMBTU

The other state's C-PACE program has experienced significant year over year growth since it was established, reaching over $37M total in 2015 ($11.1M for EE upgrades). Thus, considering that by 2018 the RI C-PACE program will have been running for three years, it is assumed it will have experienced its ramp up phase and its annual volume will be proportional to the other state's 2015 C-PACE volume (i.e. $2.5 per year in RI).

**Attributable Savings: 48%**

Because the C-PACE program in the other state also benefits from utility EE incentives, as does the Rhode Island C-PACE program, the same attribution rate is applied to C-PACE as was observed for the OBR programs (48%).

# MEMORANDUM

**TO:** State of Rhode Island Energy Efficiency and Resource Management Council (EERMC)

**FROM:** Alex Hill, Senior Consultant and Principal, Dunsky Energy Consulting

**RE:** Interpreting the National Grid Large Commercial and Industrial (LCI) On-Bill Repayment (OBR) Program Process Evaluation Report

## AN INITIAL REVIEW OF THE CADMUS LCI OBR EVALUATION REPORT

In general, the LCI sector OBR program evaluation report prepared by Cadmus (hereafter referred to as the Cadmus report) presents a valuable snapshot of the program's processes, and many of the recommendations point to possible improvements that should benefit the program in the coming years. However, **we propose that an alternative perspective may be relevant to a few of the report's key conclusions** when the full body of findings are taken into consideration.

Dunsky has prepared this brief memo to capture the three key observations and conclusions that we believe can be drawn from the evaluation findings when considering how the OBR program fits into the Rhode Island's evolving EE financing terrain.

1. The report indicates that the LCI OBR may not be contributing to a number of the EERMC's goals (including supporting deeper savings and lowering the cost per unit savings);
2. An integrated approach among OBR, C-PACE and EBF is needed to optimize savings resulting from financing efforts;
3. The need for further near-term injections into the LCI OBR Revolving Fund does not appear to be supported from the report findings.

We address each of these elements one by one in the following pages. **Overall these conclusions should be considered during both the 2017 Annual EE Program Plan development, and the 2018-2020 three-year plan development.** They also suggest that a deeper review of the OBR program design may be warranted in preparation for the next three-year plan development.

## KEY OBSERVATIONS

Based on the analysis provided in the Cadmus report, along with program data that the Dunsky obtained from National Grid EE Program Year End Reports and our on-going tracking of the OBR programs, we propose the following three key conclusions. We believe these can contribute to the Council's understanding of the OBR program, and be considered in future annual and three-year EE program discussions.

### 1. The LCI OBR program may not be contributing to a number of the EERMC's objectives

The Cadmus report's first conclusion in the Executive Summary and Report body is that "The OBR Program design is appropriate to program goals, conforms to industry standards, and results in satisfied customers" (Page "x"). However, while customers appear to be satisfied with the program, **the LCI OBR program has not demonstrated success in either supporting deep savings (beyond lighting measures) or reducing the incentive cost of savings, which have been rising steadily for OBR supported projects.**[1] This suggests that further program design and delivery modifications, beyond the recent extension of the loan tenor to 5 years, may be needed for the program to meet the Council's objectives.

The Cadmus report indicates a few key strategies that should be pursued to help guide OBR lending toward supporting deeper savings and/or reducing incentive costs, including applying quantitative goals and targets for the OBR program. Beyond these we would propose that the following be considered:

- The program benchmarking points to some best practices from other programs that should be considered for National Grid's OBR program, including:
  - **Limiting the lighting portion of OBR supported projects,** thus encouraging National Grid staff and customers to design more robust energy saving packages, as per the California OBF program that limits lighting to 20% of supported project costs.
  - **Allowing longer term OBR loans (10 year) to government buildings** based on their ability to use longer term financing to support deeper savings in their operating budgets, and based on the low credit-risk profile of public buildings[2].
- Putting quantifiable goals on the OBR program should be coupled with establishing a methodology for net-savings analysis to attribute savings between financing and incentives for all rate-payer supported financing programs.

[1] Table 2 on Page "v" of the Executive Summary indicates that lighting upgrades represented 92% of measures over the studied period. This may be more precisely understood if the portion of savings or loan value that lighting represented was expressed, but nonetheless it indicates that despite offering longer loan terms, the OBR program continues to focus on lighting upgrades, almost exclusively. Second, based on data provided by National Grid, presented in Table B appended, it can be seen that the incentive cost per kWh of savings supported by the OBR program has increased from $0.26 to $0.35 between 2012 and 2015.

[2] This could have a significant impact as 39% of the projects supported by the LCI OBR program in 2015-16 were in government buildings. Alternatively, the current lighting projects could be packaged with longer-term financing opportunities and directed to RIIB's EBF or C-PACE programs.

## 2. An integrated approach among OBR, C-PACE and EBF is needed to optimize savings

Despite being referred to as the Large Commercial and Industrial (LCI) OBR program, **the Cadmus report indicates that over the 2015-2016 period over 67% of the OBR loan funds were directed at the Government and MUSH segments**, with 39% going to government buildings alone (See table 3 appended to this memo). Moreover, the vast majority of OBR-supported projects focus on lighting measures (95% in 2016). It is also noted in the study that there is minimal participation in the OBR program by customers who lease their premises.

This leads to the following:

1) Efforts should be made to **explore why the OBR program is generating significantly lower interest in the Commercial and Industrial markets**, and efforts should be made to ensure that the program is tailored to its intended market.[3]

2) The **OBR program appears to be cherry-picking low-hanging fruit in the MUSH sector that could better be leveraged by long-term lending of deep savings packages** through RIIB's Efficient Building Fund (EBF) and C-PACE programs.[4]

3) The LCI OBR program should **consider ways to support savings among customers who rent or lease their facilities**.

Ultimately, these conclusions suggest that **the LCI OBR program may be competing with the EBF program and therefore an integrated marketing approach is needed** among the EBF, C-PACE and LCI OBR programs to tailor each program to its best suited market:

- The EBF program should focus on all municipal government facilities
- RIIB should explore options to support savings in state government facilities
- The C-PACE program should focus on non-municipal or state owned MUSH facilities, private LCI customers who own their facilities, and possibly federal government buildings
- The LCI OBR program should reduce its lending in the areas that EBF and C-PACE target, and focus on the hard to reach customers, and those that may not fit into the above categories, such as renters, retail spaces and smaller offices.

This may ultimately reduce the LCI OBR loan volumes, but **if an integrated approach is taken** to opportunity identification, loan origination and marketing, **then the overall effect of the three programs working together may lead to deeper savings at a lower cost** than the current LCI OBR program delivers.

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[3] While government and MUSH sector clients make up 67% of the loan value, they represent just 40% of the account base, indicating that there may be significant saving opportunities that remain untapped in non-institutional market segments.

[4] The C-PACE program may also be an effective tool to capture much of the non-MUSH sector LCI OBR activity as it is focused on building owners. This would also offer the opportunity to drive projects with deeper savings, more robust measure mixes and longer term paybacks supported by C-PACE's long term loans offer (up to 20 years).

## 3. The need for near-term injections to the LCI OBR Revolving Fund does not appear to be supported

The second conclusion presented by the study (in the Executive Summary on Page "x", and in the Report Body on p. 59) states that "The OBR Program requires substantial future allocations to the fund in order to fulfill its potential for increased participation." **However, this conclusion is not supported by the majority of the data and analysis provided within the report**, and the data that does support it appears to contain flawed values when compared to National Grid's annual program report data.

The need for planning further injections is based on the OBR revolving fund sustainability analysis presented on pages 37-40 of the report. From this, only the scenario where the fund would grow at 60% per year over 2015 values supports the need for further revolving fund infections within the 2018-2020 period. This scenario would be highly unlikely, and is itself built from annual OBR loan volume data that does not correspond to values presented in National Grid's Year End reports (2011-2015) or data provided to Dunsky by National Grid staff (see Tables A and B appended to this memo).

In fact, most of the other scenarios suggest that the current revolving fund will be sufficient to meet OBR program needs until at least 2021, and likely much longer than that (see Table 1 below).

**Table 1: Fund Sustainability Scenarios from the Cadmus report**

| Growth Scenario | Year when revolving fund is exhausted | Fund allocations | Source in report |
|---|---|---|---|
| **Volume plateaus at $9M** | Beyond 2026 | Not indicated | Figure 8 |
| **10% annual growth** | 2025-26 | $1.5M in 2017 | Figure 10 |
| **20% annual growth** | 2023-24 (est.) | $1.5M in 2017 | Interpolated from Figure 10 |
| **30% annual growth** | 2021 | $1.5M in 2017 | Figure 10 |
| **60% annual growth** | 2019 | $1.5M in 2017 | Figure 10 |

## THE BOTTOM LINE

Given these observations, we propose that alternative conclusions may be drawn from the Cadmus evaluation report, and that further actions on the LCI OBR program be taken accordingly.

**An OBR Program Design Review would be a valuable next step:** The Cadmus report results indicate that a review of the OBR program design and how it is integrated with the delivery of incentives and other financing offers would be valuable to identify modifications to the program that can support deeper and/or cheaper savings from the application of OBR financing.

Understanding what markets are best suited to the OBR program, and which can be better served through RIIB's programs, can help to fix appropriate loan volume and savings targets for the OBR program.

Only once this review has been performed, and the target set, can accurate projections be made as to the potential need for further injections into the OBR revolving funds, or whether money would be better invested in other EE financing programs or incentives.

## Appendix: Relevant Data Tables

**Comparison of Loan Volume Data**

Upon review of the Cadmus report we noted a discrepancy between the loan volumes presented in the study and those reported by National Grid elsewhere. These may impact the probable OBR program growth projections used in the report to assess the revolving fund sustainability. Cadmus' 60% projected year over year (YOY) growth does not appear to match the historical trend for the years 2012-2015.

**Table A: Annual Reported LCI Electricity OBR Loan Volume by Data Source**

| Year | Cadmus report values | Cadmus YOY growth | National Grid Year End reports | National Gird YOY growth | National Grid Staff to Dunsky |
|---|---|---|---|---|---|
| **2012** | | | | | $ 2,833,498 |
| **2013** | | | $ 3,400,000 | | $ 3,392,512 |
| **2014** | $3,617,803 | | $ 4,100,000 | 21% | $ 4,069,143 |
| **2015** | $5,951,408 | 65% | $ 4,930,000 | 20% | $ 4,930,123 |

**Impact of a projected 60% growth rate on OBR loan and LCI retrofit incentive program budgets**

In fact, building out the 60% growth rate that is used to argue for further injections into the LCI OBR revolving fund, leads to a significant increase in the LCI retrofit incentives delivered in conjunction with the OBR loans to support the increased volumes (assuming the incentive cost per saving remains stable at $0.35 per kWh). As a point of reference, the entire LCI retrofit incentive program budget was $20,809 in 2015, $4.4M of which went to projects that also took an OBR loan. Thus it appears that the 60% growth scenario would exceed the LCI retrofit incentive budget capacity by 2018 or 2019.

**Table B: LCI Electricity OBR Data Table**

| Year | LCI Electricity OBR Volume[5] | Associated LCI Retrofit Incentives[5] | OBR YOY growth | OBR Project Savings (MWH)[5] | Incentive cost per kWh savings[6] |
|---|---|---|---|---|---|
| **2012** | $ 2,833,498 | $ 2,472,199 | - | 9,604 | $ 0.26 |
| **2013** | $ 3,392,512 | $ 2,088,311 | 20% | 9,065 | $ 0.23 |
| **2014** | $ 4,069,143 | $ 3,062,229 | 20% | 9,022 | $ 0.34 |
| **2015** | $ 4,930,123 | $ 4,431,358 | 21% | 12,753 | $ 0.35 |
| **2016** | $ 7,888,197 | $ 6,099,519 | 60%[7] | | |
| **2017** | $ 12,621,115 | $ 9,759,231 | 60% | | |
| **2018** | $ 20,193,783 | $ 15,614,771 | 60% | | |
| **2019** | $ 32,310,054. | $ 24,983,633 | 60% | | |
| **2020** | $ 51,696,086 | $ 39,973,813 | 60% | | |

[5] Source: Numbers provided by National Grid Staff – email from Jeremy Newberger, May 27, 2016
[6] Based on incentive costs per kWh of OBR supported savings – does not include OBR program costs.
[7] Cadmus report suggests 60% year over year growth is feasible moving forward.

**Loan volumes by key market sectors**

The Cadmus report provides the number of projects and accounts by sector, as well as the average size of loan per account. This allows for a determination of the amount of LCI OBR loan volume being delivered to each LCI market segment. Government and Municipalities, Universities, Schools and Hospitals (MUSH) accounts for 67% of the overall LCI program volume.

**Table C: OBR Loans by market Sector (Based on figures provided in Table 14 of the Cadmus report)**

| Market Segment | Accounts | Projects | Peak kW (avg) | Avg. Financing | Total OBR loans | Portion of OBR loans |
|---|---|---|---|---|---|---|
| **Education** | 39 | 45 | 167 | $41,239 | $1,608,321 | 15% |
| **Government** | 32 | 50 | 313 | $133,777 | $4,280,864 | 39% |
| **Manufacturing** | 15 | 15 | 601 | $76,245 | $1,143,675 | 10% |
| **Food Service** | 13 | 13 | 198 | $22,841 | $296,933 | 3% |
| **Health Care** | 8 | 16 | 1,630 | $182,431 | $1,459,448 | 13% |
| **Hotel/Motels** | 4 | 5 | 480 | $74,396 | $297,584 | 3% |
| **Retail/Wholesale** | 3 | 3 | 208 | $135,202 | $405,606 | 4% |
| **Agriculture/Mining** | 1 | 2 | 1,434 | $139,052 | $139,052 | 1% |
| **Finance, Insurance, Real Estate** | 1 | 1 | 276 | $3,598 | $3,598 | 0% |
| **Other*** | 14 | 15 | 550 | $91,798 | $1,285,172 | 12% |
| **Grand Total** | **130** | **165** | **409** | **$84,002** | **$10,920,260** | |
| **MUSH + Gov't total** | | | | | **$ 7,348,633** | **67%** |

**2016 Energy Expo Stats**

- 20,000 attendees (60,000 over last 3 yrs)
- 53% of attendees are over 50
- 46% of attendees have a household income of $50,000-$100,000
- 40% of attendees said they would like to see more energy exhibits
- 332 National Grid bill insert coupons were redeemed (2.3 million coupons distributed over last 3 yrs)
- 681 people signed up for energy audits (1,400+ over last 3 yrs)
- 38% increase from 2015 in exhibitors identified as Energy Expo participants
- 14 solar installers (up from 2 in 2014)
- 1,516 efficiency kits sold – included 6 LED lightbulbs & a desk lamp
- 81 advanced power strips sold
- 424 indoor LED flood lights sold
- 130 LED candelabra bulbs sold

**2016 Energy Expo Highlights**

Over 300 RI Career Technical Education (CTE) students from 20 different schools built two large solar-powered tree houses which were then donated to The Boys & Girls Club of Providence.

CTE students also built a 1,520 square foot Solar Energy Educational Showcase. Electrical students helped to educate show attendees on how solar power works.

Hosted a live Jobs Bank registration event, including all CTE Schools, to connect job seekers with real employers.

Cox Communications Home Technology Showcase featured cutting edge energy efficient and smart home technologies.

75+ Energy Expo exhibitors were identified with large floor decals and called out in the program.

**HOME SHOW 2017 ENERGY EXPO SPONSORSHIP**

These amounts have been reduced from the 2016 show. As promised, as additional sponsorship is realized the amount needed from NGRID and EERMC would be reduced. An additional $20,000 in sponsorship has been realized for the Energy Expo so the amount requested this year is down from $100,000 to $80,000. In the next two years we hope to cut this amount in half as support for energy education grows in the private sector.

**$40,000 Sponsorship level includes all the following**:

- Included in TV, Radio, Print and other advertising when applicable
- Included in website copy and messaging
- Included in all PR and social media
- Included in show promotions
- Use of stages for awards and / or energy related seminars etc.
- Energy related features used and promoted in Home Showcase features if applicable
- 500 tickets
- Allocated space for non-profit booths, Ngrid booths and other requested exhibitors and features as requested by OER or placed by RIBA
- Highlight of all energy related show vendors
- The promotion of energy related programs and energy audits in advertising
- **Fully coordinated and managed by RIBA. Aside from some approvals and updates, all content for Expo produced by RIBA. We will dedicate staff for this specific purpose. The features will be overseen by RIBA Executive Director**
- *NOTE: This sponsorship level doesn't allow for the resources to build and dedicate a special feature for the Expo using local area schools. However, we would make the effort to include energy related features in other special features.*

**$80,000 Sponsorship level includes the following:**

- Dedicated TV, Radio and Print advertising.
- Dedicated web content and pages
- Dedicated PR campaign
- Dedicated special promotions
- Use of stage for awards, seminars and other demonstrations
- Allocated space for NGRID, OER and affiliated non-profits.
- Special energy related features – this year we will create two ***SOLAR POWERED GREENHOUSES*** that will be donated to an inner city program or school after the show is over for teaching or community purposes. This will be a significant! The special feature will be part of a workforce development program with the Career and Tech School system. All of RI's CTE programs will take part in this state-wide project. We want to train a future generation of contractor and correlate energy with construction.
- Dedicated giveaways
- Fully integrated energy concepts in other showcase features – the 12 room show house will have energy related features called out.
- 2,000 tickets
- Energy Cash & Carry section – if applicable
- **Fully managed by RIBA. All content and coordination by RIBA**
- **Special shared booth space at show entrance with RIBA**

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EERMC CONSULTANT TEAM

Vermont Energy Investment Corporation || Optimal Energy Integrated Energy Resources

# Memorandum

| | |
|---|---|
| To: | RI Energy Efficiency & Resource Management Council |
| From: | Mike Guerard & Scudder Parker on behalf of EERMC Consultant Team |
| Date: | December 8, 2016 |
| Subject: | 2017 Proposed Scope of Work for EERMC Consultant Team |

**Proposed 2017 Scope of Work**

I. **Background**

The Consultant Team (C-Team) is pleased to provide this Scope of Work (SOW) for its services to the EERMC in 2017. As we proposed for 2016's work, this SOW ties proposed C-Team services to the Council's mission directly, linking activities to the legislated Council obligations, encompassing its "Powers and Duties" and "Additional general powers" as well as EERMC roles and responsibilities in other sections of legislation related to Least Cost Procurement (LCP).

The passage of Rhode Island's Energy Efficiency and Resources Management Council Act of 2006 (RIGL §42-140.1-6) and the companion legislation to Rhode Island's 2006 Least Cost Procurement and System Reliability Act (RIGL §39-1-27.7), positioned the EERMC to be a critical part of guiding Rhode Island on a path to becoming a national leader in energy efficiency, with resulting significant economic benefits to all Rhode Islanders. More than a decade after these, and related amendments and complementary legislation were passed, the EERMC is a critical part of the planning, public input, implementation, oversight, and coordination functions that have made LCP a vital part of the Rhode Island energy system, and an important contributor to its economy.

In this document, we cite the EERMC authorizing legislation directly and link our proposed work to those legislative directives. The first two sections of the legislation are the *Legislative Findings*, and the statement of the *Purposes for Establishment of the Council*. These documents reflect the history of utility evolution that include the "restructuring" of the utility system and the uncertainties and cost and price fluctuations associated with it. The legislation recognized energy efficiency and energy conservation as strategies that could provide enormous benefits and increased control of energy costs. It recognized that a focused effort to build a new structure that could acquire "efficiency resources" was required, that it must include sustained thoughtful input from stakeholders, provide thoughtful oversight and evaluation, and continue to educate consumers and enhance their recognition of the benefits of this new approach.

***§ 42-140.1-2*** *Legislative findings. – It is hereby found and declared:*

*(a) Rhode Island has experienced an energy cost crisis during 2005 and 2006 and faces the prospect of fluctuating and increasing energy prices in the future.*

*(b) Energy conservation and energy efficiency have enormous, untapped potential for controlling energy costs and mitigating the effects of energy crisis for Rhode Island residents and the Rhode Island economy.*

*(c) Rhode Island has lacked an integrated, comprehensive, public, stakeholder-driven organizational structure to secure for Rhode Island and its people the full benefits of energy efficiency, energy conservation, and energy resources*

*management.*

***§ 42-140.1-3*** *Establishment of council – Purposes. – (a) There is hereby authorized, created and established a council to be known as "The Rhode Island Energy Efficiency and Resources Management Council" with the powers and duties set forth in this chapter.*

*(b) The purposes of this council are to:*

*(1) Evaluate and make recommendations, including, but not limited to, plans and programs, with regard to the optimization of energy efficiency, energy conservation, energy resource development; and the development of a plan for least-cost procurement for Rhode Island; and*

*(2) Provide consistent, comprehensive, informed and publicly accountable stake-holder involvement in energy efficiency, energy conservation, and energy resource management; and*

*(3) Monitor and evaluate the effectiveness of programs to achieve energy efficiency, energy conservation, and diversification of energy resources; and*

*(4) Promote public understanding of energy issues and of ways in which energy efficiency, energy conservation, and energy resource diversification and management can be effectuated.*

**II. Proposed activities to support EERMC obligations**

The legislation outlines the Powers and Duties of the EERMC and then enumerates a list of Additional General Powers that describe the types of activities it is authorized to undertake. Many of these duties are given more specificity in other sections of the law, and some have been added in subsequent legislation.

The structure for each element in this proposed SOW is to list the discrete legislated obligation of the Council, followed by description of the activities and key deliverables proposed by the C-Team, in the following format:

*Referenced legislated language…*

**# C-Team task to support Council obligation**

- **Description:** (what will be done to fulfill task)
- **Key Deliverables:** (e.g. memo, report, or services delivered)

Table 1 summarizes these elements, along with estimated hours and costs for each deliverable. The C-Team hourly rates are the same as 2016. After the table, more detail is provided describing each task and deliverable. In addition to these core tasks, section III. provides four optional services that the C-Team could facilitate and/or or deliver directly for the EERMC, which have not been part of previous core scopes of work. These are summarized in Table 2.

Section IV. is the updated organizational chart for the C-Team's delivery model. The main adjustment to this is the expansion of the "policy" team. The members of the policy team identified in the chart will be assuming key roles in support of policy and strategic planning in 2017. The resumes for Emily Levin, Jeff Loiter, Gretchen Calcagni and Kate Desrochers are included in Attachment 1 since they were not prominently featured with the resumes submitted for other key members that were provided in 2015.

# EERMC CONSULTANT TEAM

Vermont Energy Investment Corporation || Optimal Energy — Integrated Energy Resources

**Table 1**

| | | HOURS | AMOUNT |
|---|---|---|---|
| | **(a) Develop and recommend for implementation plans, programs and standards for energy conservation, energy efficiency, and diversification of energy resources.** | | |
| 1 | 3-Year EE & SRP Plan development and submittal | 573 | $ 100,055.00 |
| 2 | Support Development, Review & Submittal of 2018 EEPP and SRP | 461 | $ 82,875.00 |
| | **(b) Monitor and evaluate plans and programs for energy conservation, energy efficiency and diversification of energy resources; in order to effectuate such evaluations the council may request audits, including performance audits, of any program for energy conservation, energy efficiency or diversification of energy resources** | | |
| 3 | Implementation oversight of 2017 EEPP and SRP | 398 | $ 72,290.00 |
| 4 | EM&V Oversight | 480 | $ 86,390.00 |
| 5 | Identification and support for program modification and enhancements | 311 | $ 57,920.00 |
| | **(c) Submit to the joint committee on energy an annual report on or before April 15 of each year, commencing in 2008, regarding the activities of the council, its assessment of energy issues, the status of system reliability, energy efficiency and conservation procurement and its recommendations regarding any improvements which might be necessary or desirable.** | | |
| 6 | Annual Report to GA | 64 | $ 12,720.00 |
| | **(d) Participate in proceedings of the public utilities commission that pertain to the purposes of the council, including but not limited to proceedings regarding least-cost procurement** | | |
| 7 | Technical Sessions and other PUC-related events | 193 | $ 35,670.00 |
| | **(e) Advise electric distribution companies with regard to implementation of least cost procurement.** | | |
| 8 | Support LCP policy and strategy | 204 | $ 38,060.00 |
| | **(f) Advise the commission of energy resources, and recommend policies, standards, strategies, plans, programs, and procedures with regard to functions of the office of energy resources** | | |
| 9 | Coordination with, and support of, OER | 345 | $ 65,435.00 |
| | **(g) Consider such other matters as it may deem appropriate to the fulfillment of its purposes, and may advise the governor, the general assembly, other parties, and the public with regard to matters pertaining to its purposes and duties, which advice may include findings and recommendations.** | | |
| 10 | Address Key Policy Issues | 158 | $ 30,140.00 |
| | **§ 42-140.1-6 Additional general powers. – In order to effectuate its powers and duties the council has the following powers: (a) To make any studies of conditions, activities, or problems related to the state's energy needs, usage, and supplies to carry out its responsibilities.** | | |
| 11 | Monitor general energy issues | 62 | $ 11,540.00 |
| | **(b) To adopt amend bylaws, to establish committees, to elect and or appoint officers and agents, and to engage consultants and professional services as necessary and appropriate to fulfill its purposes.** | | |
| 12 | Oversight of professional services funded by Council | 108 | $ 20,280.00 |
| | **(d) To work with the appropriate federal, regional, and state agencies, and private entities.** | | |
| 13 | Inter-agency coordination and stakeholder engagement | 375 | $ 69,930.00 |
| | **§ 39-1-27.7 System reliability and least-cost procurement 2(c)(6) (iv) The energy efficiency and resource management council shall conduct at least one public review meeting annually, to discuss and review the combined heat and power program, with at least seven (7) business days' notice, prior to the electric and gas distribution utility submitting the plan to the commission.** | | |
| 14 | Hold Public Review Meeting on CHP | 17 | $ 3,115.00 |
| | **Ongoing support for Council activities and interests** | | |
| 15 | General support of Council meetings, and council member-specific issues | 383 | $ 72,930.00 |
| | **CORE SUBTOTAL** | **4132** | **$ 759,350.00** |
| | **Travel & Other Expenses** | | |
| | Monthly Council Meetings | 88 | $ 8,600.00 |
| | Hearings, Stakeholder Mtgs | 73 | $ 7,040.00 |
| | Other Expenses | | $ 4,000.00 |
| | **TOTAL** | **4293** | **$ 778,990.00** |

*§ 42-140.1-5 Powers and duties. – The council shall have the power to:*

*(a) Develop and recommend for implementation plans, programs and standards for energy conservation, energy efficiency, and diversification of energy resources.*

1. **Support Development and Review of 2018-2020 Three-year Energy Efficiency and System Reliability Plan (Three-year Plan)**
    - **Description:** The development of the next Three-year Plan covering 2018 – 2020, due to be submitted by National Grid on September 1, 2017 to the RI PUC, will be a significant undertaking involving multiple stakeholders. This effort will require investigation of statewide, regional and national developments; data sourcing and analysis; meetings and negotiations; and reporting. The work conducted in 2016 developing the proposed 2018-2020 Targets provides a solid base for this undertaking. A key focus beyond confirming that the targets are met cost-effectively will be to assure that cost-*efficiency* is maximized and that the resulting preliminary budgets are properly set to achieve the energy savings and other benefits for Rhode Island ratepayers.
    - **Key Deliverables:** Participation in Collaborative meetings and associated stakeholder engagement; review and analysis of plan drafts including measure and program cost-effectiveness screening; periodic reporting to the Council; development and submittal of the C-E Report to the Council for approval, followed by subsequent support for submittal of the C-E Report to PUC; and participation in related regulatory hearings on the filing.
2. **Support Development and Review of 2018 Annual Energy Efficiency Program Plan (EEPP) and System Reliability Plan (SRP) , collectively the Annual Plan**
    - **Description:** The development of the 2018 EEPP and SRP is anticipated to be less intensive than in years when the Three-year Plan is not filed. The activities that go into the three-year planning feed in to support the Annual Plan development. However, while the overall scale of the work is less, the process timeline is compressed since the Annual Plan is required to be filed by November 1, 2017, just two months after the Three-year Plan filing. The Annual Plan process and tasks include review and consider modifications to the Technical Reference Library (TRL) that supports cost and savings consideration for the plan; review/edit a series of drafts of the plans; analysis of benefit/cost models; stakeholder coordination on key issues; develop and support submittal of EERMC's Cost-Effectiveness Report (C-E Report) within two weeks of the filing of the plan.
    - **Key Deliverables:** Participation in Collaborative meetings and associated stakeholder engagement; review and analysis of plan drafts including Technical Reference Library (TRL) and benefit/cost models; periodic reporting to the Council and engagement with individual Council members on constituency-specific topics; development and submittal of the C-E Report to the Council for approval, followed by subsequent support for submittal of the C-E Report to PUC.

*(b) Monitor and evaluate plans and programs for energy conservation, energy efficiency and diversification of energy resources; in order to effectuate such evaluations the council may request audits, including performance audits, of any program for energy conservation, energy efficiency or diversification of energy resources, that is established pursuant to Rhode Island law or is administered by a state agency, a request for an audit of any program operative pursuant to an order or decision of the public utilities commission shall be made to the commission; the council may make findings and*

*recommendations with regard to changes, modification or continuation of any programs which it has authority to monitor or evaluate.*

3. **Provide Implementation Oversight of 2017 EEPP and SRP**
    - **Narrative of activities:** In addition to reviewing monthly dashboards and quarterly reports issued by National Grid, the C-Team has developed a standardized process to conduct oversight of the EEPP and SRP's implementation that affords more a granular, real-time understanding of each program's progress to goal. Monthly meetings with C-Team sector strategy experts, National Grid's residential and C&I sector strategy groups and OER staff provide an effective forum to cover progress-to-date in each program, strategic issues related to appropriate program enhancements, as well as to support future planning of program portfolios. As part of the process, sets of key data are identified and provided monthly by National Grid to enable the C-Team and the Council to better understand implementation progress.
    - **Key Deliverables:** Monthly Sector Strategy meetings and associated coordination and data review; research and analysis on potential program modifications; as-needed reports on implementation issues at Council meetings and/or with individual Council members relating to their specific constituencies.
4. **Provide Evaluation, Measurement, and Verification Oversight**
    - **Description:** Assuring an effective process to review and confirm energy savings and associated delivery mechanisms are a critical function to support LCP. For 2017, the C-Team proposes to expand activities to include the following: (1) review of and help set priorities for long-term evaluation plans; (2) review of research plans and/or workplans for individual studies; (3) review of final EM&V reports; (4) confirm effective application to the revisions to TRL; (5) providing whatever level of interface between the EERMC and the EM&V program that may be desired; and (7) *limited and selective* review of some evaluation implementation deliverables.
    - **Key Deliverables:** Review and provide input on completed and ongoing evaluation activities in Rhode Island, with clear understanding of the overlapping studies National Grid conducts for Massachusetts' programs that have applicability to RI; review and provide input on TRL; provide ongoing feedback to National Grid regarding new measures and savings opportunities.
5. **Identify and Support Program Modifications and Enhancements**
    - **Description:** A variety of activities have been undertaken directly and indirectly related to monthly sector strategy meetings. Direct activities include follow-up research and updates on specific programs and measures identified in meetings and then provided to National Grid, and review of Requests for Proposals for vendors to deliver programs. Indirect activities include participation in working groups addressing topics that potentially support new cost-effective program concepts and additions. Current topics with working groups anticipated to continue in 2017 are Building Asset Labeling; Zero Energy Buildings; Codes & Standards Initiative Evaluation Group; and Income Eligible Best Practices Working group. The general objective of these activities is to integrate new program approaches developed through the working groups to allow for more savings to be gained and/or those savings gained more cost-efficiently. C-Team representation on behalf of the Council fulfills a unique opportunity to facilitate linkage and leveraging of these efforts.

- **Key Deliverables:** Delivery of topic-specific information on program issues for National Grid, with updates to the Council; participation in working groups to support positive outcomes tied to optimizing LCP objectives; regular reports to the Council.

*(c) Submit to the joint committee on energy an annual report on or before April 15 of each year, commencing in 2008, regarding the activities of the council, its assessment of energy issues, the status of system reliability, energy efficiency and conservation procurement and its recommendations regarding any improvements which might be necessary or desirable.*

6. **Support Issuance of Annual Report to General Assembly**
   - **Description:** Support and participate in meetings with Annual Report subgroup (OER, National Grid) to develop and submit the Annual Report by April 15, 2017. Write sections of the report, as assigned, and review and edit document drafts and final version. Provide updates to the Council and respond to direction on desired content, especially relating to the "Policy Recommendations" section.
   - **Key Deliverables:** Participation in group activities; services related to writing, reviewing and editing document; updates on progress to the Council.

*(d) Participate in proceedings of the public utilities commission that pertain to the purposes of the council, including but not limited to proceedings regarding least-cost procurement as provided for in § 39-1-27.7.*[1]

7. **Participate in Technical Sessions and Other PUC-related Events**
   - **Description:** At a minimum, it is anticipated that four events relating to EERMC activities will require participation in regulatory processes:
     - In December, 2016 the EERMC will submit proposed Savings Targets and proposed amendments to the LCP Standards to the RI Public Utilities Commission (PUC). The resulting regulatory process for review and decision-making by the PUC is expected to extend into the first quarter of 2017.
     - Ongoing activities related Docket No. 4600 (Investigation Into the Changing Electric Distribution System), which launched in March, 2016, will continue at least into early 2017 with scheduled meeting dates of January 26 and February 28 already established. It is anticipated that the outcome of these proceedings will create additional needs for EERMC input on this subject given its likely impact on energy efficiency and resource management. There is a possibility that follow-on dockets may be instituted that require EERMC participation.
     - The 2018-2020 Three-year Plan is scheduled to be filed by September 1, 2017.
     - The 2017 Annual Plan is scheduled to be filed by November 1, 2017

[1] Related legislation from the PUC section: § 39-1-27.9 Office of energy resources participation. – In any commission inquiry into, or examination of matters that relate to or could potentially impact any programs, functions or duties of the office of energy resources and/or the energy efficiency and resources management council, including, but not limited to, those programs, functions and duties pursuant to this chapter and chapters 42-140, 42-140.1, 42-140.2, and 42-141, the office of energy resources and the energy resources council shall be deemed, upon the formal request of the office or the council as appropriate, to be an interested party for all purposes, and as such, shall receive all notices and may file complaints, institute proceedings, participate as a party in administrative hearings.

- **Key Deliverables:** Preparation for and attendance at technical sessions; drafting and defense of testimony (if specifically requested to do so by the Council); participation in associated open meetings; responses to PUC information requests and review of responses to related information requests to other parties; updates to the Council; coordination of activities with EERMC Counsel.

*(e) Advise electric distribution companies with regard to implementation of least cost procurement.*

8. **Support Policy and Strategic Considerations Regarding Least Cost Procurement**
   - **Description:** The C-Team has participated in a number of important efforts that fall into this category. The work on System Integration Rhode Island (SIRI) is an example of such an effort. While the future of SIRI as a stand-alone activity is not fully spelled out beyond the beginning of 2017, many of the issues identified in SIRI and the Docket 4600 meetings have clearly highlighted that this is a time of major change in the utility business, and the energy sector more generally. The C-Team stands ready to engage in these deliberations and planning processes as needed, particularly to represent the perspective of LCP principles in these processes. The relevant topic areas include Strategic Electrification, Demand Response and active load management, treatment of efficiency options for Delivered fuels, integration with renewables, and codes.
   - **Key Deliverables:** Participation in relevant working groups; delivery of memos/reports to the Council as well as Council presentations, as appropriate.

*(f) Advise the commission of energy resources, and recommend policies, standards, strategies, plans, programs, and procedures with regard to functions of the office of energy resources including but not limited to plans, strategies, and programs to:*

*(1) implement cost-effective energy conservation and energy efficiency programs;*
*(2) promote the development of eligible renewable energy resources for Rhode Island;*
*(3) foster distributed generation of electricity and demand response;*
*(4) assist low-income households in meeting energy needs;*
*(5) coordinate the use of funds, resources, and programs from diverse resources to achieve the purposes of the office.*

9. **Advise the Office of Energy Resources (OER)**
   - **Narrative of activities:** The Council plays a key advisory role for the OER in the areas listed above. Over the last few years, the C-Team has been directed to coordinate with the OER Commissioner and senior leadership, and support and mentor staff. This includes advising on the development of strategies and tactics to align governmental agency efforts on energy issues, addressing key stakeholder interests and increasing their understanding of and access to existing programs, and supporting and informing efforts and initiatives directed at legislative and executive government levels. Also, the Council is tasked to advise the OER on Regional Greenhouse Gas Initiative (RGGI) investment strategies.
   - **Key Deliverables:** Regular updates on OER activities to the Council, as well as receiving and acting on Council direction on advisory positions for future OER activities; regular check-ins with OER Commissioner and key staff on relevant energy issues; support for RGGI planning and implementation based on Council advisement to OER.

*(g) Consider such other matters as it may deem appropriate to the fulfillment of its purposes, and may advise the governor, the general assembly, other parties, and the public with regard to matters pertaining to its purposes and duties, which advice may include findings and recommendations.*

10. **Address Key Policy Issues**
    - **Narrative of activities:** The Council identifies key areas requiring policy consideration, including specific items included in the Annual Report to the General Assembly in the "Policy Recommendation" section. The C-Team (along with OER and other individual EERMC members) helps introduce these topics, explores how they might affect the future of the energy and utility systems in Rhode Island, and engages appropriate partners in Rhode Island and elsewhere when appropriate to bring new perspectives and insights to the Council. The policy topics typically of interest are those that may influence future design of LCP and System Reliability procurement. These topics include (but are certainly not limited to): demand management and load control; the emergence of electric vehicles and energy storage; various discussions about regional issues, including infrastructure needs and costs; renewable energy development and its integration into the grid; rate design and cost recovery; ancillary services; utility incentives and performance regulation; the coordination of utility energy strategy with the more global energy issues confronting the state and the nation (climate change, economic impacts of alternate energy strategies.)
    - **Key Deliverables:** Participation in the regular sharing and exchange of "digestible" information to the EERMC, OER and individual members; facilitation of Council discussions on policy topics; issuance of Memoranda to introduce topics; participation in briefings of RI regulators and other thought leaders as requested.

*§ 42-140.1-6 Additional general powers. – In order to effectuate its powers and duties the council has the following powers:*

*(a) To make any studies of conditions, activities, or problems related to the state's energy needs, usage, and supplies to carry out its responsibilities.*

11. **Monitor General Energy Issues**
    - **Narrative of activities:** This activity will often relate to the work described in #10 above, but is likely to be more focused on specific policy options and proposals. State and regional issues relating to energy needs, usage, and supply are evolving quickly. It is part of the C-Team's role to stay abreast of these issues and support the EERMC in learning and, where appropriate, in providing input.
    - **Key Deliverables:** Periodic, as-needed, presentations to the Council; attendance at meetings on behalf of the EERMC (and with EERMC member participation) as appropriate; development of specific recommendations as requested by the Council.

*(b) To adopt amend bylaws, to establish committees, to elect and or appoint officers and agents, and to engage consultants and professional services as necessary and appropriate to fulfill its purposes.*

12. **Provide Oversight of Professional Services Funded by Council**
    - **Narrative:** The Council is currently funding professional services regarding financing issues, which will carry into late-2017. Additional budget considerations for 2016 may result in the identification of other areas requiring vendor support.

- **Key Deliverables:** Continued provision of project management oversight of finance expert Dunsky Energy Consulting; facilitation of regular reporting to solicit Council direction on desired activities and outcomes; support for the solicitation, selection and project management oversight of other vendors, as needed.

*(c) To accept and administer grants from the federal government and from other sources, public or private, for the carrying out of any of its functions, which loans or grants shall not be expended for other than the purposes for which provided.*

**N/A**

*(d) To work with the appropriate federal, regional, and state agencies, and private entities.*

13. **Support Inter-agency Coordination and Stakeholder Engagement**
    - **Description:** An important and unique function the Council provides is to support holistic approaches in support of LCP. Multiple governmental and quasi-governmental agencies and private entities have roles and activities that intersect to varying degrees with LCP. Examples of C-Team efforts to support Council fulfillment of this objective have included holding meetings (many coordinated with OER) with Department of Human Services, Housing and Community Development, Rhode Island Housing, Rhode Island Infrastructure Bank, Office of the General Treasurer, municipalities, Division of Public Utilities and Carriers, League of Cities and Towns, Grow Smart RI, Oil Heat Institute, and individual stakeholders. It is anticipated that conversations and efforts will be ongoing with most if not all of these groups going forward refine and enhance cooperative efforts related to LCP.
    - **Key Deliverables:** Reports to the Council on activities; attendance at and support of meetings; continued identification of additional opportunities to close gaps and facilitate key connections.

*(e) To apply for, accept and expend allocations, grants and bequests of funds, for the purpose of carrying out the lawful responsibilities of the council.*

**N/A**

***Related legislation relating to EERMC obligations:***

*§ 39-1-27.7 System reliability and least-cost procurement 2(c)(6) (iv) The energy efficiency and resource management council shall conduct at least one public review meeting annually, to discuss and review the combined heat and power program, with at least seven (7) business days' notice, prior to the electric and gas distribution utility submitting the plan to the commission.*

14. **Hold Public Review Meeting on Combined Heat & Power (CHP)**
    - **Description:** An annual public review meeting is required to be facilitated by the EERMC. The OER and National Grid play critical roles in the delivery of the public meeting, the review of current CHP programs and results, and related discussion regarding public input on potential enhancements.
    - **Key Deliverables:** Support for the meeting with OER and National Grid with Council input; attendance at meeting and provision of report to the Council on results; support for any associated follow-up and stakeholder communication.

*Ongoing support for Council activities and interests*

15. **Provide General Support of Council and ExComm Meetings and Council Member-specific Issues**
    - **Description:** A core set of ongoing tasks has been undertaken by the C-Team to facilitate Council communications and operations. This includes attendances at Council-related meetings and support of meeting agenda setting, coordination of stakeholder presentations, monthly C-Team activity reports for Council members, responses to Council member queries, and coordination with EERMC Counsel.
    - **Key Deliverables:** Assistance related to effective Council and ExComm meetings, including drafting agendas, reports, and updates as well as timely and effective responses to individual Council member queries.

**III. Optional activities to expand core service**

The following four areas were not identified as tasks in the C-Team's initial proposal in 2015. Since then, needs and emerging issues have evolved that present new opportunities that might benefit the EERMC that could be delivered, or facilitated, by the C-Team.

1. **EERMC Website**

The C-Team is prepared to support the redesign of the current website to provide timely content-management, a user-friendly search function and a contemporary look, which will facilitate the EERMC's directed role to "*Promote public understanding of energy issues and of ways in which energy efficiency, energy conservation, and energy resource diversification and management can be effectuated.*"

C-Team members provided a similar service to the Massachusetts Energy Efficiency Advisory Council for its website redesign in 2014 (http://ma-eeac.org/).

The majority of the C-Team's role would be to support the solicitation and selection by the EERMC of a marketing/design firm to develop the website. Once established, the C-Team would undertake the role of uploading documents in a timely fashion and providing general maintenance.

As an example of potential scope for the marketing/design firm, the following deliverables could be solicited:

- A written Strategy Brief for the site, to be reviewed and approved
- A site map, showing the recommended organizational structure of the site, navigation hierarchies and links
- Design of two alternate homepage concepts, for review and approval
- Updated content and a clear, unified voice for text on the homepage and landing pages
- Selection of stock art resources (photography and/or illustration)
- Programming, testing and deployment of the website

Based on our experience in Massachusetts, our preliminary estimate is that the website could be designed and operational in the first half of 2017, with an estimated cost of approximately $50,000 for the hiring, design, launch and on-going updates through 2017.

2. **"Teaching and Learning"**

Teaching & Learning is the commonplace concept used among educators to describe the experience of transferring information, ideas and principles between the person(s) responsible for creating and facilitating a learning experience

(teachers) and the person(s) receiving a learning experience (learners). Based on the success of the recent EERMC Retreat, the C-team offers that an intentional and well-organized teaching & learning framework and implementation plan will provide high value for Council members. Specifically, Council Members will be:

- More equally informed and knowledgeable of core energy efficiency terms and concepts
- Better prepared to tackle complex energy efficiency related topics/ issues
- Better prepared and empowered to engage in regular council meetings

**Proposed Work Plan** – The following is a complete package of proposed activities. Startup will include mapping out all critical topics, surveying council members on topics to identify highest areas of need, and creating an 11-month curriculum. Potential teaching and learning modes may include a combination of council-wide retreat(s), council-wide briefings at monthly meetings, individual council briefings, and written quarterly briefings. The following presents an illustrative budget, but most items are scalable and/or subsets could be selected.

| Teaching & Learning Work Plan | | | |
|---|---|---|---|
| **Task** | **Estimated Hours** | **Rate (avg)** | **$ Total** |
| Map out all EE Topics | 40 | 185 | 7,400 |
| Create Survey | 24 | 185 | 4,440 |
| Distribute and Review Survey Results | 16 | 185 | 2,960 |
| Draft short survey report & PPT | 24 | 185 | 4,440 |
| Draft Curriculum | 40 | 185 | 7,400 |
| Retreat | 40 | 185 | 7,400 |
| One-on One Briefings | 40 | 185 | 7,400 |
| Written briefings | 40 | 185 | 7,400 |
| TOTAL | | | 48,840 |

3. **Intern support**

   If the EERMC desired to provide workforce development opportunities for RI-based college students, the C-Team is prepared to support the recruitment, oversight and administrative support needed to hire and manage the services of an intern(s). The primary responsibility of the intern will be to assist the EERMC, and its C-Team and OER, in support of EERMC objectives and activities.

   Key tasks may include the following:
   - Supporting best practice energy efficiency research and cost-effective energy efficiency analysis tasks that enhance the development of both the three-year and annual plans
   - Assisting in development of the EERMC Annual Report to the General Assembly
   - Researching and analyzing energy policy and strategies
   - Providing logistical support for EERMC and ExComm meetings
   - Supporting the development and maintenance of a new EERMC website (if developed)
   - Assisting in writing and report development
   - Other duties as assigned by the EERMC and/or ExComm

With multiple variables including the effort required for recruitment and onboarding, scale of work (and amount of payments) to be provided, administration and other considerations, the C-Team suggests a cap of $15,000 provides a reasonable amount to secure part-time intern support for most of 2017. This is based on previous utilization of interns from the URI Energy Fellows program accessed by OER to support energy projects in 2014 and 2015.

4. **Demand Response planning, research and analysis:**
Although the development of "demand response" and "load management" ("DR" and "LM") strategies are clearly a part of the LCP mandate in Rhode Island, these capabilities have received limited investment and attention in LCP efforts to date. As distributed generation increases, regional transmission costs increase, and winter natural gas constraints pose a greater risk to the Rhode Island economy, the need for developing a more consistent and deliberate approach to delivering "time of use" flexibility in Rhode Island's energy economy becomes more apparent. The C-Team includes some time to address this effort in the scope of work outlined above, but a more focused effort to initiate and promote new strategies in this sector represents a significant opportunity to improve energy services and lower costs for Rhode Island residents. The following steps would be included in this effort:

- Actively monitor and keep up-to-date with DR/LM strategies as they are emerging in other (particularly regional) jurisdictions.
- Identify in more detail the potential benefits and costs of various strategies
- Understand how strategies might work for different customer classes
- Identify potential implementation strategies
- Propose specific program development capabilities and performance targets.

The preliminary estimate is that the above activities could be conducted with 100 hours at an average rate of $170 for a total of $17,000.

**Table 2**

| | *Optional activities to expand core service* | Est. hrs | Est. cost |
|---|---|---|---|
| 1 | **EERMC Website** | n/a | $50,000 |
| 2 | **"Teaching and Learning"** | 264 | $48,840 |
| 3 | **Intern support** | n/a | $15,000 |
| 4 | **Demand Response planning, research and analysis** | 100 | $17,000 |
| | **Options SUBTOTAL** | | **$130,840** |

**IV. C-Team composition and organizational chart**

## CORE TEAM MEMBERS

**POLICY**
Scudder Parker
(VEIC)

**PROJECT MANAGEMENT**
Mike Guerard
(OEI)

**Policy**

Emily Levin (VEIC)

Jeff Loiter (OEI)

Gretchen Calcagni (OEI)

Kate Desrochers (VEIC)

**Residential**

**Sean Bleything (VEIC)**

Glenn Reed (EFG)

Richard Faesy (EFG)

*Mark Kravatz (OEI)*

**Commercial**

**Zoe Dawson (VEIC)**

George Lawrence (OEI)

Jennifer Chiodo (CX)

**EM & V**

**Mark Kravatz (OEI)**

Ralph Prahl

*Zoe Dawson (VEIC)*

Craig Johnson (OEI)

*Glenn Reed (EFG)*

## ADDITIONAL SUBJECT MATTER EXPERTS

**CROSS-CUTTING**

Rebecca Foster (VEIC)

Peter Adamczyk (VEIC)

Brian Pine (VEIC)

Chris Kramer (EFG)

David Hill (VEIC)

Karen Glitman (VEIC)

**Residential**

Elizabeth Chant (VEIC)

Michael Russom (VEIC)

Nick Lange (VEIC)

Jim Grevatt (EFG)

**Commercial**

Phillip Mosenthal (OEI)

Matt Socks (OEI)

Eric Belliveau (OEI)

Cliff McDonald (OEI)

**EM & V**

Pierre van der Merwe (VEIC)

Alison Donovan (VEIC)

Chris Neme (EFG)

**V. Proposed budget**

The proposed billing rates are unchanged from 2016. As detailed in Table 1, the proposed budget amount is $778,990 for the C-Team for core services. The optional items are estimated at $50,000 for Website; $48,840 for "Teaching & Learning"; $15,000 for Intern; $17,000 for DR.

# Attachment 1 – Resumes of Policy Team

Emily Levin
Jeff Loiter
Gretchen Calcagni
Kate Desrochers

Vermont Energy Investment Corporation

**Emily Levin** **Manager, Program Strategies**

As a Consulting Manager, Emily Levin leads VEIC's Program Strategies group. Her team provides a full range of energy efficiency and renewable energy initiative design, planning, and implementation support services for utility customers, as well as program review and critique services for regulators and consumer advocates across the U.S. and Canada. VEIC's Program Strategies group is a national leader in designing next generation energy efficiency initiatives that harness the opportunity created by utility 2.0 business models and a next generation electric grid. She specializes in designing initiatives that serve as models of market transformation while engaging all customers, including low-income people and hard-to-reach sectors, in energy efficiency and renewable energy.

Emily has reviewed and designed energy efficiency initiatives in Maryland, New Jersey, Vermont, Florida, and other states. She recently co-authored a white paper for NYSERDA entitled, "Value-Based Compensation for Energy Efficiency," which recommended mechanisms to value energy efficiency as a resource to the electric grid. Emily joined VEIC in 2007 and has more than ten years of experience in efficiency program design and delivery. In a previous role at VEIC, Emily led strategic planning for the residential portfolio of Vermont's energy efficiency utility, Efficiency Vermont, and managed Efficiency Vermont's Existing Homes Program. Under her leadership at Efficiency Vermont, the Home Performance with ENERGY STAR program grew tenfold. Emily also led development of a statewide Vermont home energy label and created an Efficiency Excellence Network to facilitate partnership with contractors, distributors, and other supply chain partners.

## Experience

- **Pay for Performance and Innovative Procurement Models for Energy Efficiency:** Co-authored report for NYSERDA reviewing EE procurement models and options for New York; collaborated with the Natural Resources Defense Council (NRDC) on white paper, "Putting Your Money Where Your Meter Is: A Study of Pay for Performance Programs in the U.S." (to be released in December 2016).
- **Energy Efficiency Program Portfolio Review:** Led team that recommended new energy savings goals for EmPOWER Maryland and led comprehensive review of strategic initiatives (including demand response) for a Florida utility.
- **Residential Program Design:** Planned and designed programs for Efficiency Vermont's Residential Existing Homes and New Construction programs and the New Jersey Clean Energy Program.
- **Efficiency Vermont's Existing Homes Portfolio:** Managed Home Performance with Energy Star®, Low-Income Single-Family initiatives, and targeted high use/fuel switch program.
- **Industrial Economics, Inc.:** Performed environmental policy research and economic analysis for clients including the U.S. Environmental Protection Agency and U.S. Fish and Wildlife Service.

## Education and Certifications

- **University of Vermont,** Professional Certificate in Leadership and Management, 2013.
- **Master of Environmental Management, Yale School of Forestry and Environmental Studies,** 2005.
- **Bachelor of Arts, Amherst College,** Geology, 2000.
- **Phi Beta Kappa,** 2000.

## Leadership & Affiliations

- Led the initiative that created statewide Vermont Home Energy score and label.
- Frequent presenter (Market Transformation Symposium, ACI Home Performance National Conference, etc.) on topics related to new energy policies and programs, energy labeling, and residential program design.

# JEFFREY M. LOITER, PARTNER

Optimal Energy|10600 Route 116, Suite 3|Hinesburg, VT 05401|802-482-5610|loiter@optenergy.com

## PROFESSIONAL EXPERIENCE

**Optimal Energy**, Hinesburg, VT. *Partner*, 2015-present; *Managing Consultant*, 2006-2014.

As a Partner, Mr. Loiter is responsible for business development, administrative systems, and staff development in addition to project management. He also provides quality control and editing for all of Optimal's deliverables. His project work includes designing and developing statewide and utility-specific efficiency programs and supporting program implementation for both public and private-sector clients. He works primarily in the commercial sector on programs targeting electric, natural gas, and un-regulated fossil fuel consumption and specializes in developing solutions that fit the needs of specific customer segments and markets. Mr. Loiter is also an experienced analyst and uses these skills in a variety of contexts, such as reviewing and critiquing utility Integrated Resource Plans and efficiency potential studies.

**Independent Consultant,** Cambridge, MA, 2005-2006.

As an independent consultant for the Massachusetts Renewable Energy Trust SEED Initiative, Mr. Loiter evaluated renewable energy technology companies' applications for early-stage funding. Responsibilities included leading due diligence efforts on three applications and contributing to several others. Awards recommended for approval totaled $1.4 million. For a separate client, prepared two articles describing the potential impact of proposed federal legislation to increase domestic oil refining capacity, published in Petroleum Technology Quarterly (1Q 2006) and BCC Research/Energy Magazine (2006).

**Industrial Economics, Inc.,** Cambridge, MA. *Associate*, 1997-2000; *Senior Associate*, 2001-2004.

Managed multi-disciplinary qualitative and quantitative assessments of natural resource damages and environmental policy for clients such as NOAA, USFWS, USEPA, USDOJ, the National Park Service, the State of Indiana, and the United Nations.

**URS Consultants, Inc.,** New Orleans & Boston., 1991-1995.

Prepared water, air, and solid and hazardous waste permit applications for state and federal agencies on behalf of industry clients.

## EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA
Master of Science in Technology & Policy, 1997

**Cornell University,** Ithaca, NY
Bachelor of Science with distinction, Civil and Environmental Engineering, 1991

## REPRESENTATIVE PROJECT EXPERIENCE

**Delaware Department of Natural Resources and Environmental Control, Energy Efficiency Advisory Council Program Development and Support (2015-present)**
Optimal Energy provides broad program planning, analysis, and strategic guidance to the Delaware Energy Efficiency Advisory Council as it begins developing a new model for joint utility and public-sector delivery of energy efficiency services, with the objective of dramatically increasing energy savings and demand reductions in that state. In support of the Council, Mr. Loiter drafted Council organizing documents and regulations specifying evaluation, measurement, and verification (EM&V) procedures and standards. He also provided the Council with proposed electric and gas energy savings targets as supported by an earlier potential study.

**Connecticut Municipal Electric Energy Cooperative, Conservation and Load Management Consulting (2006-present)**
Optimal has provided energy efficiency consulting services to the Connecticut Municipal Electric Energy Cooperative (CMEEC) since the inception of their conservation and load management programs. Mr. Loiter contributes to the full range of these services, including program planning, program savings analysis and reporting, developing incentive and delivery strategies, and managing CMEEC's participation in the ISO-NE Forward Capacity Market. The latter has included drafting M&V plans specifying procedures for meeting all ISO-specified M&V rules and developing a web-based data tracking and reporting system. Mr. Loiter also helps CMEEC develop strategy for and manage participation in new FCM auctions and arranges for required annual certification reviews.

**Orange and Rockland Utilities, Energy Efficiency Program Consulting (2006-present)**
Optimal Energy supports program implementation and on-going program design and development for Orange and Rockland Utilities, a subsidiary of Consolidated Edison, Inc. Mr. Loiter managed the preparation of a DSM plan and Commission filings for this client during the initial phases of the New York State Energy Efficiency Resource Standard. Prior to that, he led the commercial sector component of an electric and gas potential study for the utility, which included on-site customer audits and residential surveys.

**New York State Department of Public Service, Generic Environmental Impact Statement and Supplement (2014-2016)**
As part of proceedings on Reforming the Energy Vision (REV) and the Clean Energy Fund (CEF), Optimal contributed to a Generic Environmental Impact Statement (GEIS) by describing alternative energy supply resources, the potential scale of their use under two future scenarios, and the magnitude of possible negative environmental impacts that would result. Mr. Loiter led a team researching several technologies, including energy efficiency, customer-sited renewables, combined heat and power, alternative rate structures, and energy storage. The research led to estimates of the potential scale and impact of these solutions to New York's future energy challenges.

**Various Clients, Expert Witness Services (2007-present)**
For the Sierra Club and other advocacy organizations, provided analysis and expert testimony in several cases before public utility commissions in several states, including Ohio, West Virginia, and Virginia. Topics have included DSM program approvals, integrated resource planning dockets, and CPCN cases for natural gas-fired power plants.

**Maryland Energy Administration, EmPOWER Maryland Filing Reviews (2008-2009)**
As part of efforts to reduce per-capita electric and natural gas under the 2008 EmPOWER Maryland Energy Efficiency Act, the Maryland Energy Administration was responsible for reviewing and commenting on utility-delivered energy efficiency programs and for designing and implementing its own state-wide efficiency portfolio. Mr. Loiter contributed to both of these efforts, appearing before the Public Service Commission on two occasions.

**US EPA, National Action Plan for Energy Efficiency (2006-2007)**
Prepared two documents for inclusion with EPA's National Action Plan for Energy Efficiency: a guidebook on conducting efficiency potential studies and a handbook describing the funding and administration of clean energy funds.

## REPRESENTATIVE PUBLICATIONS

"Collaboration that Counts: The Role of State Energy Efficiency Stakeholder Councils," (with D. Sosland, M. Guerard, and J. Schlegel), *2012 ACEEE Summer Study on Energy Efficiency in Buildings,* Pacific Grove, CA, August 2012.

"Persistence and Cost of Behavioral Programs," presented at National Association of State Utility Consumer Advocates Mid-Year Meeting, Charleston, SC, June 2012.

"Impending EISA Lighting Standards: Impacts on Consumers and Energy Efficiency Lighting Programs," presented at National Association of Regulatory Utility Commissioners Annual Meeting (with M. DiMascio), Atlanta, GA, November 2010.

"From Resource Acquisition to Relationships: How Energy Efficiency Initiatives Can Work Effectively with Large Commercial & Industrial Customers," (with E. Belliveau, J. Kleinman, D. Gaherty, and G. Eaton), *2008 ACEEE Summer Study on Energy Efficiency in Buildings,* Pacific Grove, CA, August 2008.

National Action Plan for Energy Efficiency (2007). *Guide for Conducting Energy Efficiency Potential Studies.* Prepared by Philip Mosenthal and Jeff Loiter, Optimal Energy, Inc. December.

Loiter J.M and V. Norberg-Bohm (1999), "Technology policy and renewable energy: public roles in the development of new technologies," *Energy Policy* Vol.27 no.85-97

# GRETCHEN A. CALCAGNI, CONSULTANT

Optimal Energy|10600 Route 116, Suite 3|Hinesburg, VT 05401|802-482-5615|calcagni@optenergy.com

## PROFESSIONAL EXPERIENCE

**Optimal Energy**, Hinesburg, VT. *Consultant*, 2016-present; *Senior Analyst*, 2015; *Analyst,* 2012-2014

At Optimal, Ms. Calcagni provides research, analytical, and writing and presentation support on a range of projects including advisory council technical services, potential studies, white papers and policy reports, and expert testimony. She has expertise in the fields of program planning and evaluation, policy support, and best practices research, and often takes a lead role in developing client reports, memos, and presentations.

**Rocky Mountain Institute,** Boulder, CO. *Research and Consulting intern,* Summer 2011

During her time interning at RMI, Ms. Calcagni researched the economic, environmental, and social benefits of improved energy efficiency in the affordable housing sector. She interviewed nonprofit housing organizations across the country to identify barriers to constructing energy efficient affordable housing. She also collaborated with stakeholders to advance a sustainability network of affordable housing organizations

**Vermont Housing and Conservation Board,** Montpelier, VT. *Grants Coordinator*, 2009-2010

As the Grants Coordinator at VHCB, Ms. Calcagni processed, documented, monitored and reported on funding awards for VHCB's grants programs.

**Nortel Government Solutions,** South Burlington, VT. *Administrative Specialist*, 2008-2009

Ms. Calcagni worked on-site at the US Citizenship and Immigration Services Northeast Regional Office and contributed to development and implementation of standard operating procedures and policies for U.S. Citizenship & Immigration Services training programs totaling $55 million.

**Vermont Humanities Council,** Montpelier, VT. *Community Programs Assistant*, 2007-2008

At VHC, Ms. Calcagni coordinated with other organizations and individuals to manage and implement community education programs. She frequently tracked and analyzed program data for use in reports and budget development.

## EDUCATION

**Duke University**, Sanford School of Public Policy, Durham, NC

Master of Public Policy, 2012

Masters Project: *Household Willingness to Pay for Improved Energy Efficiency in the U.S. Rental Housing Market*

**University of Virginia,** Charlottesville, VA

Bachelor of Arts with Highest Distinction, Sociology, Minor in Psychology, 2007

## REPRESENTATIVE PROJECT EXPERIENCE

**Massachusetts Energy Efficiency Advisory Council, Technical Consulting Services (2014-present)**
Optimal Energy serves as the lead technical consultant to the Massachusetts Energy Efficiency Advisory Council (MA EEAC) since its inception in 2006. Optimal's role includes representing the EEAC on all aspects of negotiating efficiency programs, plans, goals and budgets with the program administrators, and oversight of all program implementation and evaluation, monitoring and verification activities. To support the EEAC, Ms. Calcagni provides ongoing support for efficiency program planning and analysis by tracking and analyzing quantitative and qualitative data as well as developing memos, presentations, and other work products. Her past work included research on energy efficiency best practices, policies, programs, market trends, and technologies that relate to lodging facilities to produce a memo with recommendations and steps for more effectively reaching these commercial customers. She also manages technical services for the EEAC including maintaining and updating the EEAC website, producing the consultant team monthly report, and producing the annual report to the DPU and Legislature.

**Rhode Island Energy Efficiency and Resources Management Council, Policy and Program Planning Consulting (2014-present)**
Optimal Energy co-manages a team of consultants providing support to the Rhode Island Energy Efficiency and Resource Management Council (EERMC) on topics ranging from high-level policy and legislative issues down to the oversight of program implementation and infrastructure development. To support Optimal's work for the EERMC, Ms. Calcagni provided program planning and design for a two-stage pilot energy efficiency program for residents and small business on Block Island. She analyzed data from the first stage of implementation to assess program progress, screen for cost-effectiveness, and identify potential improvements for the next phase of program implementation. She is currently coordinating the 2018-2020 energy savings target setting process in Rhode Island. The process includes: a trend analysis of past program performance; the reviewing of key factors, such as changing lighting markets which may impact future program performance; jurisdictional comparisons to nearby states; stakeholder feedback workshops; and development of a final report with recommended savings targets.

**DSM and IRP Filings, Expert Testimony Support (2013-2016)**
Ms. Calcagni has provided support for expert testimony on behalf of environmental respondents for DSM and IRP cases in several states. Testimony has assessed proposed efficiency investments for comprehensiveness, adherence to best-practices, and likelihood of success as well as energy efficiency potential, achievable load reductions from efficiency programs, and the costs thereof, among other topics. Supporting tasks included reviewing filings, checking analyses of program savings and cost-effectiveness, interpreting evaluation findings, gathering information and data, and drafting written testimony.

**Delaware Department of Natural Resources and Environmental Control, Delaware Potential Study (2014-2015)**
Optimal Energy completed a study to estimate the energy efficiency savings potential in Delaware for electricity, natural gas and unregulated fossil fuel from 2014-2025. To better inform future Delaware efficiency program goals and planning, the study also provides a realistic set of example programs that could be implemented to achieve those savings and the associated cost estimates for acquiring those resources. To support this project, Ms. Calcagni researched program best practices and market barriers as well as developed measure characterizations for a statewide energy efficiency potential study in Delaware. She completed market research through phone interviews targeting the residential, commercial, and industrial sectors to investigate the attitudes of potential energy efficiency program participants and identify program strategies most likely to overcome efficiency market barriers in

Delaware.

**Michigan Public Service Commission, Options for Establishing Energy Efficiency Targets in Michigan (2013)**
In 2012, Optimal was selected by the National Association of Regulatory Utility Commissioners on behalf of the Michigan Public Service Commission to analyze the energy savings targets established by state statue, as well as the formula for calculating targets, and to recommend potential adjustments. To support this effort, Ms. Calcagni developed a report to provide a set of savings targets and policy options from which the Michigan legislature could select following the year 2015. She quantified energy savings target and program budget options based on results of a potential study completed by GDS Associates. She also researched additional considerations and opportunities that may affect the level of savings that could be achieved in the State including demand targets and integrated demand response programs, expanded savings potential from promising technologies, and cost-effectiveness test selection.

**New York Power Authority, Best Practices for Energy Cost Savings in New York State Schools (2012-2013)**
Pursuant to legislative requirements, the New York Power Authority hired Optimal Energy to develop a study of statewide energy efficiency and renewable energy best practices for public and private K-12 schools in New York State. The study includes an overview of the historic performance of NYPA's Energy Services for Schools Program, a high-level estimate of economic and maximum achievable energy efficiency potential and an estimate of bounded technical potential from on-site photovoltaic installations, a summary of high-impact efficiency and clean energy retrofit opportunities based on a review of energy audits conducted for New York City schools, and recommendations for best practice program approaches based on a review of leading national programs. Ms. Calcagni researched best practice program designs and drafted report sections for the study.

**New York Power Authority and New York State Energy Research and Development Authority, Energy Services Performance Contracting Manual (2013-2014)**
In 2013, Optimal began for the New York Power Authority to develop an energy savings performance contracting (ESPC) manual for public entities and schools within New York State (NYS). Initial manual development was completed in concert with NYPA staff. Optimal also worked with the New York State Energy Research and Development Authority to continue development of an ESPC manual for government customers (including state, county, and local) and schools in NYS. Ms. Calcagni acted as a key contributor to this project by researching ESPC best practices and developing content for the manual.

**Energy Efficiency for All, Natural Resources Defense Council, National Housing Trust , New York State Multifamily Efficiency Opportunities Whitepaper ( 2014)**
Optimal Energy was hired to develop a white paper describing high level estimates of economic and achievable efficiency potential in the multifamily sector in New York State as well as policy, programmatic and impact and spending recommendations. Ms. Calcagni researched and developed content related to efficiency potential in multifamily house, best practices for overcoming barriers to efficiency in the multifamily sector. She analyzed historical multifamily efficiency program data in New York and elsewhere to help inform findings and recommendations. The paper was included as an addendum to the client's filing in proceedings related to the state's "Reforming the Energy Vision" process.

## PUBLICATIONS

"Efficiency 2.9: The Policies and Framework behind Massachusetts' #1 Energy Efficiency Ranking," (with I. Finlayson, A. Pollard, E. Belliveau, and J. Schlegel), *2016 ACEEE Summer Study on Energy Efficiency in Buildings,* Pacific Grove, CA, August 2016.

Vermont Energy Investment Corporation

**Kate Desrochers** **Senior Analyst**

Kate Desrochers works on a diverse portfolio of energy efficiency and renewable energy programs, including providing analytic expertise for third-party review of efficiency programs in Rhode Island and Maryland; creating technical resource manual (TRM) measure characterizations; developing potential studies, including one focused on alleviating issues of a "duck curve" caused by increased solar installations; and extensive modeling and analysis for the Solar Market Pathways project funded through the Department of Energy's Sunshot Initiative and a study on the pathway to and impact of high solar penetration in Vermont (20% of electrical demand by 2025).

Working on the Vermont Solar Market Pathways project, Kate has developed a model of Vermont's current and future total energy demand and generation through 2050 under different savings scenarios. She incorporates variables and technology scenarios at the device, household and regional level. She has analyzed data at the regional level based on demographics and historical fuel use data, and projected demand based on forecasted population changes. Throughout this work, she has collaborated with variety of stakeholders within the industry to synthesize potential useful scenarios.

Kate began her career at the environmental consultancy Marstel-Day. Her areas of specialty involve GIS modeling, advanced qualitative analysis, and communications engagement support. She has completed projects for the US government in Japan, the United Kingdom, and Colorado.

## Experience

- **VT Solar Market Pathways, Efficiency Vermont (2014-2017):** Developed a model of the current and future Vermont total energy demand and generation through 2050 under different savings and technology scenarios at the device, household and regional level.
- **Efficiency Vermont, R&D Project on Strategic Electrification:** Addressed idea developed in the Vermont Comprehensive Energy Plan to transform Vermont's thermal energy away from fossil fuels and convert to electrification and biomass. Identified and evaluated potential obstacles with increasing loads to the grid, communicated with utilities to examine load shapes and delivery constraints. Developed understanding of complexities and challenges faced by utilities managing the grid in rural and urban areas with growing electrification. Mapped numerous factors to aid in analysis, such as distributed generation installations, constrained grid areas, electric vehicle registrations, heat pump sales, and projected population changes.
- **Vermont Technical Reference Manual:** Assisted in the development of the high efficiency furnace and boiler technical reference manual, identifying and standardizing savings relating to these technologies.
- **Marstel-Day:** Researched and analyzed best practices for energy and land use conservation. Served as Marstel-Day's Green Vision Council Chair; directed efforts to measure and improve internal conservation and sustainability efforts.

## Education and Certifications

- **Bachelor of Arts, Dartmouth College,** Geography, *magna cum laude,* 2012.
- **University of Hyderabad,** Hyderabad, India, 2011.
- **ArcGIS 10.2:** High proficiency.

## Leadership & Affiliations

- **New England College Women's Regional Coordinator,** 2011.

# EERMC 2017 Budget - DRAFT

***Last Updated 11/29/2016***

| Income | | | |
|---|---|---|---|
| | 2016 Carry Over - Client Fund | $ | 125,430 |
| | SBC - Electric (2016) | $ | 816,300 |
| | SBC - Gas (2016) | $ | 304,300 |
| | **TOTAL INCOME** | **$** | **1,246,030** |

| Expenses to Main Account | | Budget CY 2017 | |
|---|---|---|---|
| **Consultant Services** | | **$** | **791,450.00** |
| | Core allocation | $ | 770,450.00 |
| | Travel/Expenses | $ | 5,000.00 |
| | EERMC Intern | $ | 15,000.00 |
| | Member Retreat | $ | 1,000.00 |
| | | | |
| **Legal Counsel** | | **$** | **25,000.00** |
| | | | |
| **Annual Report** | | **$** | **5,000.00** |
| | | | |
| **Council Travel** | | **$** | **500.00** |
| | | | |
| **Public Education** | | **$** | **75,000.00** |
| | | | |
| **Stretch Code Development (Residential)** | | **$** | **15,000.00** |
| | | | |
| **Subtotal** | | **$** | **911,950.00** |

| | | |
|---|---|---|
| **Unallocated** | **$** | **208,650.00** |

| Expenses to Client Fund | | Budget CY 2017 | |
|---|---|---|---|
| **Finance Study, Dunsky** | | **$** | **90,000.00** |
| | | | |
| **Subtotal** | | **$** | **90,000.00** |

| | | |
|---|---|---|
| **Unallocated** | **$** | **35,430.30** |

| | | |
|---|---|---|
| **TOTAL Expenses** | **$** | **1,001,950.00** |

| | | |
|---|---|---|
| **Unallocated** | **$** | **244,080.30** |

STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

# 2017 Meeting Calendar

**with tentative topics**

| | | | |
|---|---|---|---|
| **Thursday, January 5** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, January 19** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote on final C-team work plan & 2017 EERMC budget & Dunsky contract extension
- Review preliminary results of 2016 Energy Efficiency Program
- Discuss potential policy recommendations for EERMC Annual Report
- Finalize new member appointment recommendations for submission to Governor's office
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, February 2** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, February 16** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Review final results of 2016 Energy Efficiency Program
- 2016 year end EERMC budget report
- Finalize policy recommendations for EERMC Annual Report
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, March 2** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, March 16** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote to extend attorney contract or go out to bid
- Review draft EERMC Annual Report
- Review 3-Year Plan development process
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, April 6** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, April 20** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote on final EERMC Annual Report
- Update on 3-Year Plan development
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, May 4** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, May 18** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Update on 3-Year Plan development
- Q1 National Grid report
- Q1 EERMC budget report
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, June 1** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, June 15** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Update on 3-Year Plan development
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, July 6** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, July 20** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Review first draft of 3-Year Plan
- Review draft RFP for next three years of C-team services
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, August 3** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, August 17** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote on final 3-Year Plan for September 1st filing
- Vote on RFP for next three years of C-team services
- Update on 2018 Annual Plan
- Q2 National Grid report
- Q2 EERMC budget report
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, September 7** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, September 21** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Review first draft of 2018 Annual Plan
- MEMBER RETREAT?

| | | | |
|---|---|---|---|
| **Thursday, October 5** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, October 19** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote on 2018 Annual Plan for November 15th filing
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, November 2** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, November 16** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Vote on cost-effectiveness memo for 2018 Annual Plan
- Q3 National Grid report
- Q3 EERMC budget report
- Review draft EERMC 2018 budget & C-Team work plan
- Special topic: TBD

| | | | |
|---|---|---|---|
| **Thursday, December 7** | **1:00 – 2:30 PM** | **Executive Committee** | **Conference Room B** |
| **Thursday, December 21** | **3:30 – 5:30 PM** | **Full Council** | **Conference Room A** |

- Review (vote on, if possible) final draft EERMC 2018 budget & C-Team work plan
- Discuss new member appointment recommendations
- Special topic: TBD