



MEETING MINUTES

Wednesday, November 10, 2016 | 3:30 - 5:30 PM

Conference Room B, 2nd Floor, Department of Administration, Providence, RI

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

Members Absent: Betsy Stubblefield Loucks, Diane Williamson

Others Present: Robert Beadle, Brian Buckley, Kat Burnham, Gretchen Calcagni, Mike Guerard, Mark Kravatz, 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.

Meeting Materials



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

MEETING MINUTES

Wednesday, October 19, 2016 | 4:00 - 5:00 PM

President's Dining Room, 2nd Floor Donovan Dining Center, Rhode Island College

Members in Attendance: Abigail Anthony, Bob Bacon, Roberta Fagan, Carol Grant, Anthony Hubbard, Tom Magliocchetti, Michael McAteer, Shigeru Osada, Chris Powell, Betsy Stubblefield Loucks, Karen Verrengia, Diane Williamson

Members Absent: Joe Cirillo, Jennifer Hutchinson

Others Present: Mike Guerard, Mark Kravatz, Courtney Lane, George Lawrence, Scudder Parker, Rachel Sholly, Nick Ucci

1. Call to Order

Chairman Chris Powell called the meeting to order at 4:15 PM.

2. Approval of Meeting Minutes

Shigeru Osada provided a clarification on the minutes, which will be corrected. Betsy Stubblefield Loucks made a motion to approve the minutes. Bob Bacon seconded and all approved.

3. Executive Director Report

Commissioner Carol Grant of the Rhode Island Office of Energy Resources (OER) reported that since the last meeting of the Council OER issued its first annual report on Lead by Example activities under the Governor's Executive Order. The report will be available on the OER website and will be presented to the Council at a future meeting.

Diane Williamson made a motion to move the voting items up before the Executive Committee report on the agenda. Abigail Anthony seconded and all approved.

4. Updates on Energy Efficiency Programs and System Reliability Procurement

a) Vote on Cost-Effectiveness Memo

Mr. Guerard presented the consultant team's final memo verifying the cost-effectiveness of the 2017 Energy Efficiency Program Plan and the 2017 System Reliability Plan (*see attached*). He reported that it is very similar to previous memos with updated numbers and the Council had seen a version of it at the last meeting. The Council's approval today would direct the consultant team to work with EERMC legal counsel to file the memo with the Public Utilities Commission.

Karen Verrengia made a motion to approve the cost-effectiveness memo as presented. Anthony Hubbard seconded and all approved.

5. Council Business

a) Vote on Dunsky Energy Consulting Contract Extension Proposal

The Council discussed the proposal to extend Dunsky's contract for finance expertise, which expires on October 31, 2016 (*see attached*). The Council decided not to vote on the proposal today because of

concerns over the 13% increase in costs. The consultant team will convey the Council's concerns to Dunsky and request a revised proposal for the November meeting. Chairman Powell asked the consultant team to look into potential impacts of the US-Canadian exchange rate. Ms. Anthony said that, other than the cost, the proposal content looks good.

6. Executive Committee Report

There was no report.

7. Policy and Planning Issues

a) Savings Targets Development and Standards Revision Update

Mr. Guerard presented the consultant team's initial recommendations on 2018-2020 savings targets and proposed revisions to the energy efficiency and system reliability standards (*see attached*). Mr. Osada asked to see the breakdown of where estimated savings come from and to see trends overtime. The consultant team will share the extensive Excel workbook from which these numbers were derived to any interested Council members. Chairman Powell requested to see the document a week in advance if possible.

8. Public Comment

There was no public comment.

9. Adjournment

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



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

November 10, 2016

Introduction and Overview

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

The proposed targets were developed in conjunction with Targets and Standards Sub-Committee

Introduction and Overview

- Extensive process to identify the achievable potential of electric and natural gas savings in RI for 2018-2020
- Input of key stakeholders (Collaborative and other interest groups) helped steer process and analysis
- While there is some uncertainty in forecasting the future, the C-Team has high confidence that the process undertaken effectively identifies an achievable potential, and then proposes specific annual targets that properly reflect the “prudent and reliable” approach identified in LCP law



Potential Savings Range (% of 2015 Retail Sales)

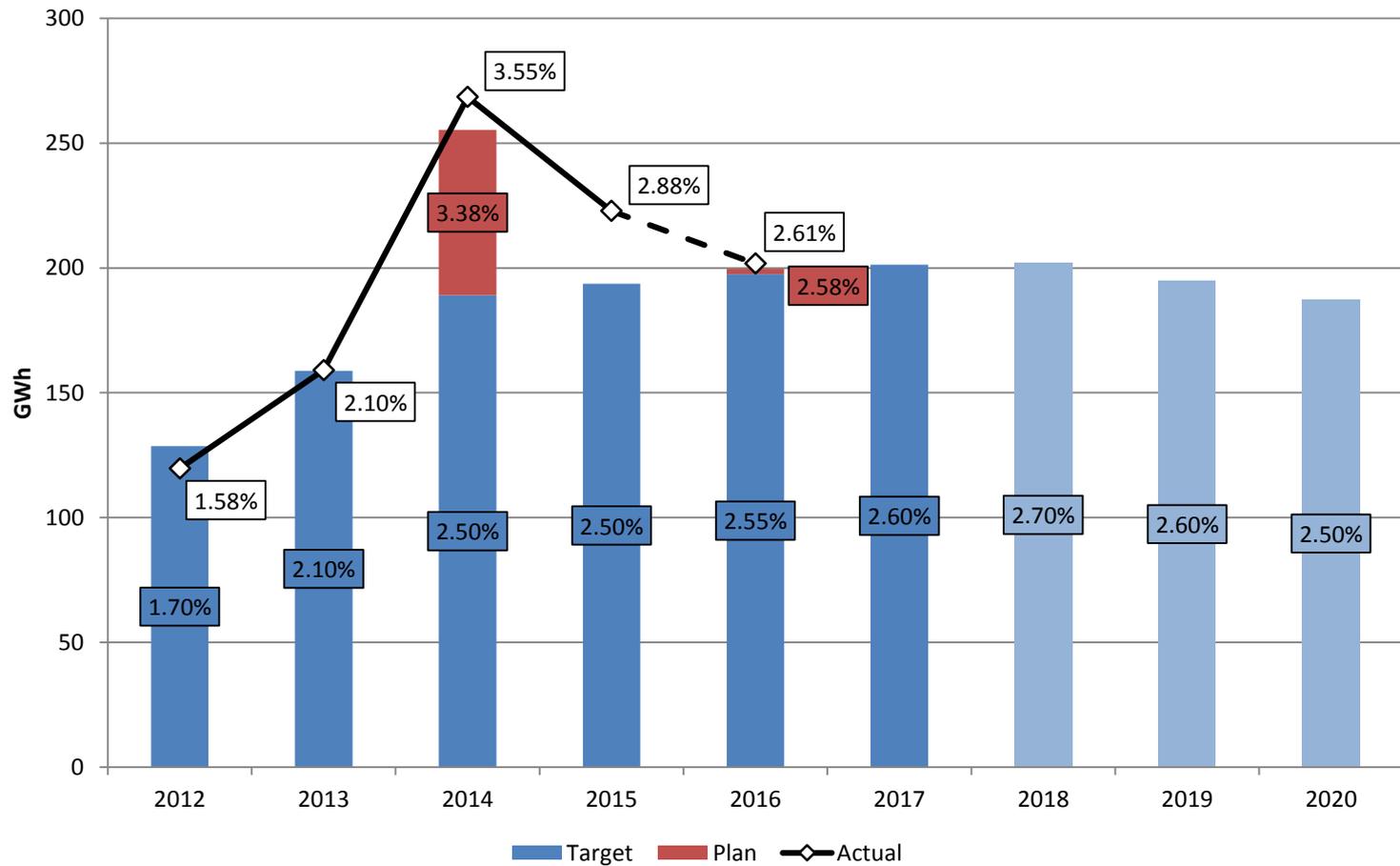
| | Electric | | | | Gas | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 2018 | 2019 | 2020 | Total | 2018 | 2019 | 2020 | Total |
| Base Potential Estimate | | | | | | | | |
| Residential | 1.12% | 0.88% | 0.75% | 0.91% | 0.34% | 0.36% | 0.37% | 0.36% |
| Low Income | 0.09% | 0.09% | 0.08% | 0.09% | 0.07% | 0.07% | 0.07% | 0.07% |
| C&I | 1.44% | 1.48% | 1.51% | 1.48% | 0.53% | 0.53% | 0.53% | 0.53% |
| Total | 2.65% | 2.45% | 2.30% | 2.47% | 0.93% | 0.95% | 0.97% | 0.95% |
| Adjustments to Base Potential | | | | | | | | |
| Codes & Standards | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Proposed Modifications to LCP Standards | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| New Technologies | 0.2% | 0.2% | 0.25% | 0.23% | 0.10% | 0.10% | 0.13% | 0.12% |
| Potential= Base + Enhancements | | | | | | | | |
| | 2.85% | 2.65% | 2.55% | 2.70% | 1.03% | 1.05% | 1.10% | 1.07% |

Proposed 2018-2020 Savings Targets

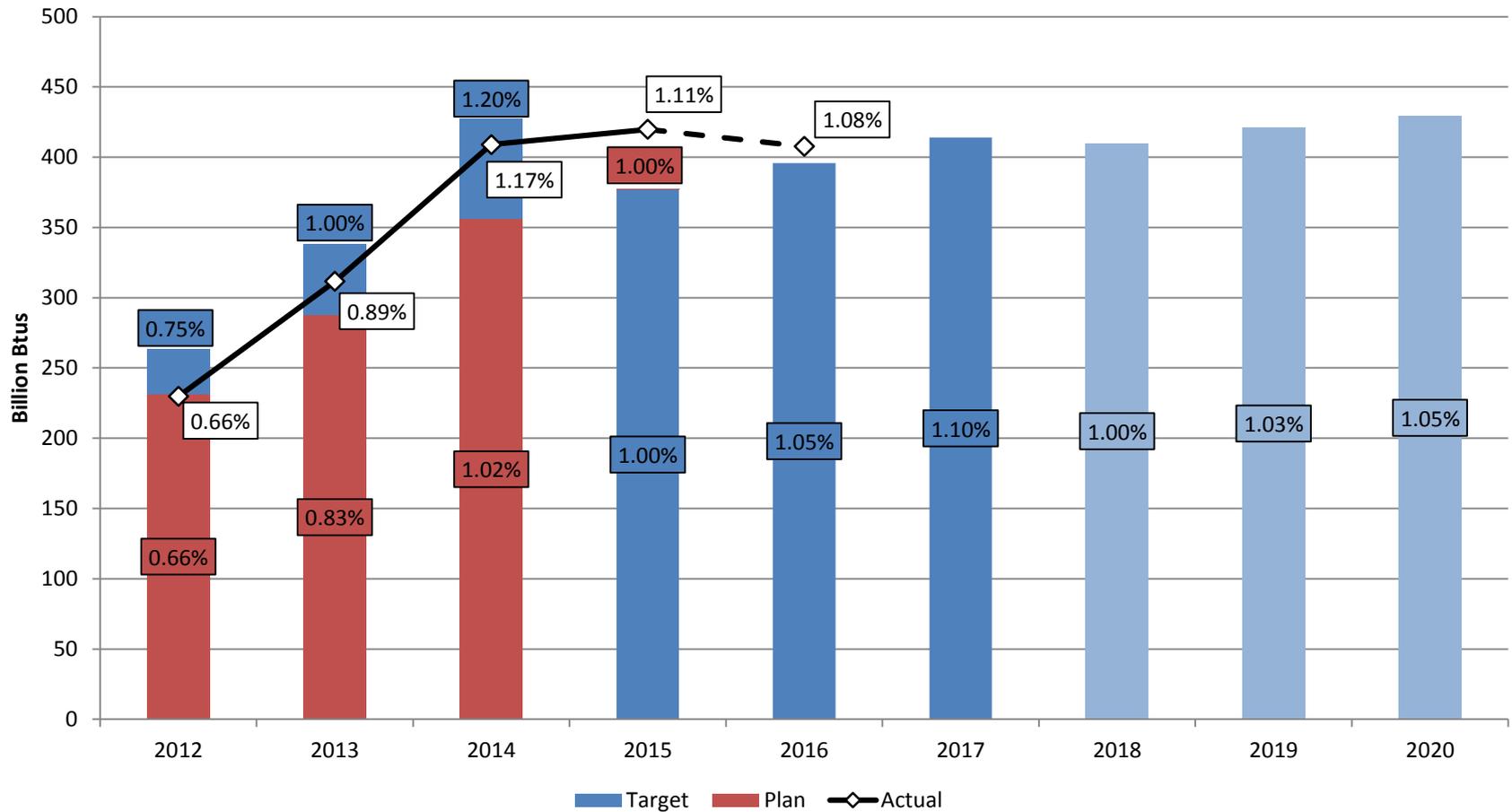
| Targets | 2018 | 2019 | 2020 | 2018-2020 |
|---------------------|---------|---------|---------|-----------|
| Electric (MWh) | 202,166 | 194,678 | 187,191 | 584,035 |
| % of 2015 Sales | 2.70% | 2.60% | 2.50% | 2.60% |
| | | | | |
| Natural Gas (MMBtu) | 409,513 | 421,799 | 429,989 | 1,261,301 |
|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



Historical Targets; Plans; Actuals—Electric



Historical Targets; Plans; Actuals—Natural Gas



Developing 2018-2020 Targets

- For the 2018-2020 Targets, an alternative approach to set the base was used. The current portfolio of programs was reviewed and programs were projected out to 2020 with appropriate assumptions on services and measure increases and/or decreases.
 - This allowed for a consistent process to set the electric and gas base levels
- This analysis was conducted in close coordination with C-Team members and National Grid Planning, Strategy, Sales & Implementation staff over the last two months.

Core Programs Potential Estimates

- Used a bottom-up approach to identify 2018-2020 potential from existing programs
- Estimated potential by program, which was then rolled up to the sector and portfolio levels in master goals worksheets (one for electric and one for gas)
- Core program potential spreadsheet contains over 40 data and analysis worksheets

RI Key Drivers Tracking Spreadsheet Update_10.17.16 - Microsoft Excel

| | | Actual | | Planned | | | |
|---|--|-----------|-----------|-----------|-----------|-----------|-----------------|
| | | 2015 | 2016 | 2018 | 2019 | 2020 | Total 2018-2020 |
| DRAFT Preliminary Savings Goals – Portfolio as Sum of th | | | | | | | |
| ELECTRIC - PORTFOLIO | | | | | | | |
| Annual Retail Energy Sales Comparison (MWh) | | 7,650,181 | 7,650,181 | 7,487,623 | 7,487,623 | 7,487,623 | 22,462,870 |
| Lifetime Energy Savings as % of Annual Energy Sales | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Lifetime Energy Savings Goals (MWh) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Annual Energy Savings as % of Energy Sales | | 2.91% | 2.61% | 2.65% | 2.45% | 2.30% | 2.47% |
| Annual Energy Savings Goals (MWh) | | 222,718 | 199,759 | 198,689 | 183,201 | 172,540 | 554,430 |
| Measure Life (Years) | | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! |
| Annual Demand Savings (kW) | | | | | | | |
| DRAFT Preliminary Savings Goals – Residential | | | | | | | |
| ELECTRIC - RESIDENTIAL | | | | | | | |
| Annual Retail Energy Sales Comparison (MWh) | | 7,650,181 | 7,650,181 | 7,487,623 | 7,487,623 | 7,487,623 | 22,462,870 |
| Lifetime Energy Savings as % of Annual Energy Sales | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Lifetime Energy Savings Goals (MWh) | | 0 | 0 | 0 | 0 | 0 | 0 |
| Annual Energy Savings as % of Energy Sales | | 1.35% | 1.28% | 1.12% | 0.88% | 0.72% | 0.91% |
| Annual Energy Savings Goals (MWh) | | 102,958 | 97,945 | 84,065 | 65,999 | 53,576 | 203,640 |
| Measure Life (Years) | | | | | | | |
| Annual Demand Savings (kW) | | | | | | | |
| DRAFT Preliminary Savings Goals – Low Income | | | | | | | |
| MasterGoalsProjectionElectr | | | | | | | |



Program Example: Residential Energy Star HVAC (Electric)

- Analysis of potential for most programs was done at the measure level
- Considered actual and planned measures from recent years
- Developed annual projections of savings for each measure (considered inputs such as unit numbers and Net-to-Gross factors)

| 2016 BCR Draft 2 - Electric HVAC | Quantity | FR | SO | Kwh/ Unit | Net MWh | % Net MWh | Net MWh Check | 2018-2020 Electric HVAC | 2016 Quantity | 2018 Quantity | 2019 Quantity | 2020 Quantity | Kwh/ U |
|---|----------|-----|-----|-----------|--------------|-------------|---------------|---|---------------|---------------|---------------|---------------|--------|
| Central Air QIV | 198 | 25% | 16% | 45.0 | 8.11 | 1% | 8.11 | Central Air QIV | 198 | 218 | 240 | 264 | 4 |
| Central Air SEER 16.0 EER 13 | 142 | 42% | 28% | 198.8 | 25.49 | 3% | 24.28 | Central Air SEER 16.0 EER 13 | 142 | 156 | 172 | 189 | 19 |
| Central Air SEER 18.0 EER 13 | 100 | 35% | 28% | 276.8 | 27.03 | 3% | 25.74 | Central Air SEER 18.0 EER 13 | 100 | 110 | 165 | 248 | 27 |
| Central Air Digital Check-up/Tune-Up | 100 | 15% | 0% | 64.8 | 5.51 | 1% | 5.51 | Central Air Digital Check-up/Tune-Up | 100 | 110 | 121 | 133 | 6 |
| Down Size 1/2 Ton | 20 | 15% | 0% | 203.0 | 3.45 | 0% | 3.45 | Down Size 1/2 Ton | 20 | 22 | 24 | 27 | 20 |
| Duct Sealing | 570 | 15% | 0% | 212.0 | 102.71 | 10% | 102.71 | Duct Sealing | 570 | 627 | 690 | 759 | 21 |
| Early Retirement Central Air (Retire) | 9 | 15% | 0% | 259.0 | 1.98 | 0% | 1.98 | Early Retirement Central Air (Retire) | 9 | 10 | 11 | 12 | 25 |
| Early Retirement Heat Pump (Retire) | 9 | 15% | 0% | 1,189.0 | 9.10 | 1% | 9.10 | Early Retirement Heat Pump (Retire) | 9 | 10 | 11 | 12 | 1,18 |
| Circulator Pump | 75 | 0% | 0% | 142.3 | 10.68 | 1% | 10.68 | Circulator Pump | 75 | 400 | 600 | 900 | 14 |
| Furnace ECM | 0 | 35% | 15% | 168.0 | 0.00 | 0% | - | Furnace ECM | 0 | 0 | 0 | 0 | 16 |
| QI w/ Duct modifications | 0 | 25% | 16% | 513.0 | 0.00 | 0% | - | QI w/ Duct modifications | 0 | 0 | 0 | 0 | 51 |
| Heat Pump Quality Installation and Verification - Eng | 15 | 25% | 16% | 308.0 | 4.20 | 0% | 4.20 | Heat Pump Quality Installation and Ve | 15 | 17 | 17 | 18 | 30 |
| Heat Pump SEER 16.0 EER 12 HSPF 8.5 | 62 | 35% | 28% | 450.3 | 25.96 | 3% | 25.96 | Heat Pump SEER 16.0 EER 12 HSPF | 62 | 78 | 85 | 94 | 45 |
| Mini Split HP SEER 18.0 HSPF 9 | 130 | 45% | 7% | 286.0 | 23.05 | 2% | 23.05 | Mini Split HP SEER 18.0 HSPF 9 | 130 | 228 | 303 | 404 | 28 |
| Heat Pump SEER 18.0 HSPF 9.6 | 10 | 35% | 28% | 1,077.8 | 10.02 | 1% | 10.02 | Heat Pump SEER 18.0 HSPF 9.6 | 10 | 18 | 23 | 31 | 1,07 |
| Mini Split HP SEER 20.0 HSPF 11 | 130 | 45% | 70% | 330.0 | 53.63 | 5% | 53.63 | Mini Split HP SEER 20.0 HSPF 11 | 130 | 228 | 303 | 404 | 33 |
| Mini Split Heat Pump QIV | 35 | 0% | 0% | 113.0 | 3.96 | 0% | 3.96 | Mini Split Heat Pump QIV | 35 | 44 | 55 | 68 | 11 |
| Central Air Digital Check-up/Tune-Up | 22 | 15% | 0% | 373.4 | 6.98 | 1% | 6.98 | Central Air Digital Check-up/Tune-Up | 22 | 24 | 27 | 29 | 37 |
| Heat Pump Water Heater <55 gallon, Electric | 404 | 0% | 0% | 1,654.0 | 668.22 | 66% | 668.22 | Heat Pump Water Heater <55 gallon, Electric | 404 | 606 | 758 | 947 | 1,65 |
| WiFi Enabled Thermostat with Cooling - Oil | 25 | 0% | 0% | 104.0 | 2.60 | 0% | 2.60 | WiFi Enabled Thermostat with Cooling | 25 | 100 | 133 | 178 | 10 |
| WiFi Enabled Thermostat with Cooling - Gas | 180 | 0% | 0% | 104.0 | 18.72 | 2% | 18.72 | WiFi Enabled Thermostat with Cooling | 180 | 700 | 770 | 847 | 10 |
| TOTAL | | | | | 1,011 | 100% | 1,009 | TOTAL | | | | | |
| | | | | | | 89% | | | | | | | |



Program Enhancement Potential Estimates

- Factors of 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 Adjustments the Consultant Team identified are more speculative and more difficult to quantify.



Program Enhancement Potential Estimates

- Effort to capture the impact of Enhancements was organized into three general categories:
 - Codes & Standards;
 - LCP Standards;
 - New Technologies and Program Enhancements.
- Of these, only the “New Technology” item affords the ability to effectively quantify potential.
- Codes and Standards and LCP Standards have the potential to appreciably impact achievable potential estimates in any of the years between 2018-2020. Even though an estimate of impact is premature, the intent is to assure that these items are clearly covered in future annual planning cycles to evaluate potential impact.



Next Steps

- 2nd draft will be sent to EERMC on 12/2 in advance of 12/8 EERMC meeting
 - Input from EERMC at 11/10 meeting and follow-up comments from council members
 - Collaborative meeting on 11/15 (morning) for stakeholder input
 - Targets and Standards Subcommittee conference call on 11/15 (afternoon) to review input, and on 11/29 to review final draft
- PUC Meeting on 11/30 to present high level summary of Targets & Standards
- EERMC meeting on 12/8 – Vote on Targets and Standards, including direction to C-Team and EERMC Counsel to submit recommendation to PUC
- Target date of 12/16 to submit Recommendation to PUC

EERMC CONSULTANT TEAM



1st DRAFT 11-4-16

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

November 4, 2016

EERM CONSULTANT TEAM



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EERMC CONSULTANT TEAM



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 RI Public Utilities Commission (“Commission” or “PUC”) in December, 2017. 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 2015¹.

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 simultaneously. 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. 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 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

¹ The 2015 year is the last complete year of actual of actual sales to use 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.

EERMC CONSULTANT TEAM



(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.

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.

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." Since 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, 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.

The Consultant Team wants 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

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

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purpose of the targets is simply to guide the development of those plans. The 2010 legislation recognizes that the energy savings targets themselves do not constitute a plan, but rather the targets are just high-level estimates of the potentially available cost-effective efficiency, 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 what this clarification should translate to, we assert 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 Energy Efficiency Program Plan (EPPP) and either 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). The parties participating in the annual EPPP 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 if such transfers will permit securing savings 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.

The Consultant Team believes that 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 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.

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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, on the current state and potential of the existing market. Further, the industry's evolving markets, emerging trends and innovation were also 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.

A. There are different markets and opportunities for efficiency.

There is not a bright line dividing the types of opportunities for efficiency. However, different kinds of efficiency require different levels of customer investment and engagement and consequently

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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, make a very substantial investment for complex measures and installations with multiple barriers and high cost.

1. 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.

This is an important and very positive evolution. 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. While 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 “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 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 targeted to wholesalers and retailers to stock these new products and make room on shelves for them.
- “Upstream” programs which 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

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upstream efforts affect stocking practices, and accelerate acceptance of preferred products. Administrative hassles 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 made 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, in fact 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.

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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—ironically—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 program³ 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 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. ASAP and 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*,⁴ 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 will 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.

2. Long-lived Measures, Complex Installations, Multiple Barriers, High Cost

We offer that the line between these two categories, 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

³ [http://www.ripuc.org/eventsactions/docket/4654-NGrid-EEPP-2017\(10-17-16\).pdf](http://www.ripuc.org/eventsactions/docket/4654-NGrid-EEPP-2017(10-17-16).pdf) pp. 25-27 of Attachment 2

⁴ 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

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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.

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.

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The Consultant Team believes that 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:

1. 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?
2. 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?
3. 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?
4. How can we select and promote new data acquisition and usage so that it will help solve real problems for customers and the utility?
 - a. What are the costs and benefits of AMI and could AMI (in some version) support better:
 - i. Diagnostics,
 - ii. Real-time management
 - iii. Pay for Performance strategies

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- iv. Demand savings for customers and the utility
- v. Better integration of customer and grid-side resources?
- 5. How will electrification in appropriate settings be incentivized and integrated into the system in ways that maximize both societal benefits and system benefits?
- 6. Can we actually create new market-based partnerships for comprehensive treatment that use financing, utility incentives, and new market players?
- 7. Can we create a new vision of “Smart Buildings” that will change the culture of investment?
- 8. 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.

Recommended Efficiency Savings Targets

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, and then proposes specific annual targets that properly reflect the “prudent and reliable” approach identified as an important aspect of Least Cost Procurement. The Consultant Team recommends the following electric and natural gas savings targets as effective guideposts to support upcoming Three Year Planning, as well as the ensuing Annual Plans:

Table 1 | 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% |

Summary of Electric Targets and Development Process

This section presents the Consultant Team’s estimate of cost-effective efficiency potential that National Grid could achieve through ratepayer-funded efficiency programs in Rhode Island. The intent of 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 detail on the costs 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.

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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 as well as likely additional savings potential outside of the current core program offerings. 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

After conducting a detailed analysis informed by a broad array of available information, the Consultant Team estimates an achievable potential that is prudent and reliable of 584 GWh and 1,261,301 MMBtu of natural gas potential for 2018 through 2020, as shown in the Table 1 above.

The electric savings targets presented above fall in the middle of the full achievable potential savings range identified by the Consultant Team and National Grid. Given the considerable uncertainty with regards to lighting and other quickly changing markets, selecting a target in the middle of the range provides a number that is both aggressive, but reasonable. At the portfolio level, the savings targets 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 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. Therefore, the actual MMBtu savings for 2018-2020 are still planned to increase over the planned MMBtu savings in 2017.

Stakeholder Input

The Consultant Team has worked closely with the 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.

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Overview of Methodology and Results

Table 2 summarizes the available range of quantitative estimates of potential using the consistent metric of “annual savings as a percent of load” for the entire state. Briefly, the data were generated as follows:

- 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.
- *Adjustments to potential* refer 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 that 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 *Revised Potential Estimate* represents the base potential estimate plus a reasonable estimate of adjustments.

Table 2 summarizes the results in terms of percent of 2015 sales, the most recent year of actual sales available as a reference point. The base potential estimate is listed at the top by sector. Adjustments to potential are either positive, negative, or zero – zero indicating that we found insufficient justification for making an adjustment in either direction based on factors netting out. A description of the adjustments is included in the “Adjustments to Base Potential” section of this document. Together, the base potential as well as the adjustments represented a range of achievable savings potential in Rhode Island for 2018-2020.

Table 2 | Consultant Team Revised Electric Potential Estimate

| Potential Estimate (% of 2015 retail sales) | | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Electric | | | | Gas | | | |
| | 2018 | 2019 | 2020 | Total | 2018 | 2019 | 2020 | Total |
| <i>Base Potential Estimate</i> | | | | | | | | |
| Residential | 1.12% | 0.88% | 0.75% | 0.91% | 0.34% | 0.36% | 0.37% | 0.36% |
| Low Income | 0.09% | 0.09% | 0.08% | 0.09% | 0.07% | 0.07% | 0.07% | 0.07% |
| C&I | 1.44% | 1.48% | 1.51% | 1.48% | 0.53% | 0.53% | 0.53% | 0.53% |
| Total | 2.65% | 2.45% | 2.30% | 2.47% | 0.93% | 0.95% | 0.97% | 0.95% |
| <i>Adjustments to Base Potential</i> | | | | | | | | |
| Codes & Standards | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Proposed Modifications to LCP Standards | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| New Technologies | 0.2% | 0.2% | 0.25% | 0.23% | 0.10% | 0.10% | 0.13% | 0.12% |
| <i>Potential= Base</i> | 2.85% | 2.65% | 2.55% | 2.70% | 1.03% | 1.05% | 1.10% | 1.07% |

Commented [MG1]: Analysis still being refined on Enhancements.

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+ Enhancements

Note: Totals may not equal the sum of their respective pieces due to rounding

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 did not accurately reflect 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. As an example, the screen shot below represents the assumptions used to estimate the savings potential of the xxx program. Data considered included actual program 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.

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 disproportionately 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 adjustments to base potential.

Commented [MG2]: In development. Not available yet.

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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 Table 2 represent the average of the Consultant Team and National Grid's final base potential estimates.

Adjustments to Base Potential

Intro

As detailed in the introductory sections, the energy efficiency industry is undergoing significant changes. Factors of 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 Adjustments the Consultant Team identified are more speculative 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 Enhancements was organized into three general categories: Codes & Standards; LCP Standards; and New Technologies and Program Enhancements. Of these, only the "New Technology" item affords the ability to effectively quantify potential. However, the inclusion of the other two is important given the expected process of reviewing Targets as part of each Annual Plan development. The Consultant Team represents that the Codes and Standards and LCP Standards will have the potential to appreciably impact achievable potential estimates in any of the years between 2018-2020. So even though an estimate of impact is premature, the intent here is to assure that these are items that are clearly covered in future annual planning cycles to evaluate potential impact.

Codes and Standards

(Text forthcoming)

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

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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 the general statements on this, 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, but not easily quantifiable yet.

New Technologies and Program Enhancements (non-quantified)

- **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.
 - **Opportunity:** This is an EPA listed product but it is not currently being offered in RI. Any codes and standards or policy change could influence the potential significantly. Heat Pump Dryers could provide additional gas savings potential in the Residential Multifamily market.
- **Advanced RTU controls⁵:** A rooftop unit (RTU) is an air handler (a device 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% ⁶of 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 and control as well as variable speed drives, demand-controlled ventilation, and other features.
 - **Opportunity:** The opportunity from advance RTU controls is primarily in the Commercial retrofit market (for facilities with fairly new but code-minimum RTUs, this retrofit may be the best choice). Facilities with older RTUs may benefit more

⁵ Oct 2015: Northeast/Mid-Atlantic Commercial Packaged HVAC (“Rooftop Unit”) Market Transformation Strategy Report

⁶ 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.

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from a wholesale replacement of the RTUs). This technology could provide gas and electric savings

- **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.
 - Opportunity: This technology presents gas and electric savings for Commercial new construction – it allows users to control the amount of heat or light that passes through the glass at the flick of a switch.
- **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.
 - Opportunity: Data servers could provide gas and electric savings potential for the commercial market through existing data center upgrades and retrofit.
- **CO2 systems:** CO2 refrigerant operating equipment (AC, heat pump etc.) are used in both C&I and Res sectors
 - Opportunity: Significant thermal saving potential. Some of CO2 systems under Efficiency Vermont observation are delivering higher temps and therefore more the building space/water heat capacity for the entire year. Moderate temp performance isn't necessarily better than 410A but the early indications are that this could present a great air to water option that gets close to full replacement for boilers in the northeast. Systems could provide gas savings in the C&I market.
- **UPS systems:** Uninterruptible Power Supply - and other server technology uses power more energy-efficiently.
 - Opportunity: UPS systems could provide additional gas and electric savings in the commercial sector through existing data center upgrades and retrofit.
- **DOAS:** A dedicated outdoor air system (DOAS) is a type of heating, ventilation and air-conditioning (HVAC) system using chilled beams "pipes of water passed through a "beam" as a heat exchanger.
 - Opportunity: This is a proven technology for new construction in the commercial sector and could provide additional gas and electric savings.

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Additional items focused on program enhancements beyond Base assumptions

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

Boiler reinstallations – Savings attributable to boiler installations was reduced by 1/3 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 and provide 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 contaminate drinking water. Reduced flow rates can save money on water and energy costs.
 - **Opportunity:** This technology is readily available and is offered in other jurisdictions through a prescriptive rebate as an energy and water saving conservation measure. It is not currently offered in Rhode Island and could provide additional gas savings potential in the C&I Hospital and Health Care sector.
- **Wifi 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 wifi sales in future for both single-family and multi-family applications, providing gas savings.

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- **Optimized ECM Pump controls:** ECM (Electronically Commutated Motor) technology helps to make circulators used for hydronic and radiant heating systems be more energy efficient. The intelligent speed control these circulators provide can drastically reduce energy usage when compared to the conventional, static speed technology.
 - Opportunity: They are currently offered in Massachusetts and will be offered upstream in Rhode Island in 2017 as part of the HVAC upstream program. ECM Pump controls could provide gas and electric savings in both C&I and residential markets. The scale of adoption may not be fully accommodated in the Base analysis.
- **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.
 - Opportunity: Providing retrofit opportunity to existing growers could provide additional gas and electric savings potential in the commercial and residential sectors. The potential impact could increase in the future pending legal changes in recreational use.
- **Behavior:** While the market for behavioral programs is dominated by a single vendor with a distinct approach (OPower's Home Energy Reports), 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.
 - Opportunity: National Grid's Home Energy Report program savings rate projection is declining through 2020, but there is a general consensus that savings from behavior-led programs (beyond the current programmatic model) are a possibility and are supported by a wide range of studies, peer literature reviews that assumed average electric savings range from minimum 5% up to 25% for residential programs⁷. Alternative models could provide gas and electric savings in the commercial and residential sectors.

⁷ Chicago recently accomplished an additional benefit of 4-6% electricity savings and 10% gas for their residential behavior programs (Useful comparison given climate, LI/MF resident mix)

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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.

Commented [MG3]: Analysis still underway for this section. Values put in Table 2 are minimum expected amounts.

| Technology/Program Expansion | Savings/unit/year | Potential (number of units installed needed to hit DT potential) |
|---|-------------------|--|
| Laminare Flow Restrictor Devise | x MMBtu | xxx |
| Optimized ECM Pump controls | xx kWh | xx |
| Wifi thermostats program expansion | xx MMBtu | xx |
| Duct Sealing (across EW-SF, LI, MF) expansion | xx MMBtu | xx |

Commented [GC4]: Still working on content/numbers, for this table

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 Standards

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.

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The TRC Test was redefined 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.
 - Prudence 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 NWAs

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Summary of Revisions to SRP Standards

The SRP Standards were originally developed to focus specifically on strategic use of non-wires alternatives (NWA) 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 to postpone or avoid more expensive infrastructure projects, reduce the cost of grid improvements, and proactively deploy 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, prudence, and reliability, and add 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 3-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

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- 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”, “prudence”, 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 prudence, 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 being) provided for them.

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- 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.

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- The 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

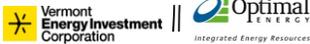
What has happened with energy efficiency in Rhode Island is remarkable. Rhode Island’s 2006 Least Cost Procurement mandate has driven a level of effort, savings and benefit to RI customers that have put it at the forefront nationally.⁸ This new approach allowed Rhode Island to gain this success by reversing 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 EERMIC in 2010 and 2013. The Consultant Team’s position is that it is not appropriate to suggest estimated budgets for the 2018-20 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>

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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 in 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.

- **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 Rhode 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 2016 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.

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- **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. **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 that the National Grid energy efficiency programs should plan to achieve in the years 2018, 2019, and 2020.

Commented [GC5]: To be expanded.

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Attachment 1

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 Plans⁹ 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.

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

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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

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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 provisional¹⁰ 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. Prudence 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.

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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.

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- 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

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- 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

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- 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

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Energy Investment
Corporation



Optimal
ENERGY
Integrated Energy Resources

- 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

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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.

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- 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 generation¹² generally, including combined heat and power and renewable energy resources¹³
 - (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 technologies¹⁴
 - (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)

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- 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. Prudence
 - 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

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- 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 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, prudence, environmental responsibility, and the comparison of costs and benefits as defined below¹⁶.
- 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.

¹⁶It 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.

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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 benefits¹⁷ 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. **Three Year System Reliability Procurement Plan**

- 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.

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- 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 focus¹⁸ 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. Annual System Reliability Procurement Report**
- 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 NWA¹⁹;
 - (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

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- 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;

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- 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. **SRP Performance Incentive Plan**

- 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.

nationalgrid

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National Grid Third Quarter Results 2016

EERMC Meeting

11/10/16



Electric Sector Results

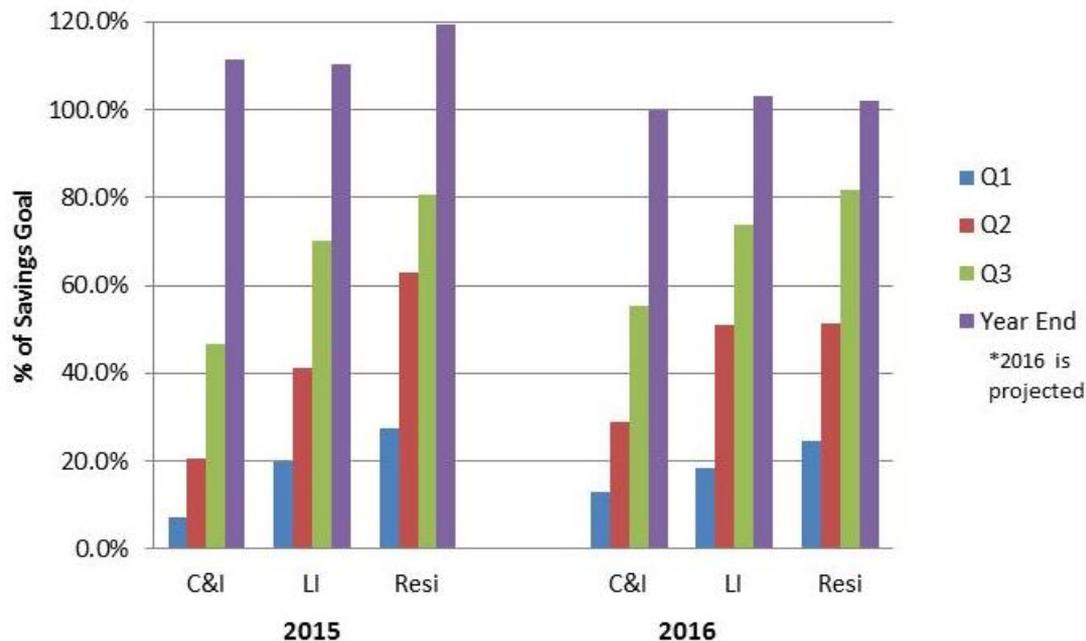
nationalgrid

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Progress Towards Filed 2016 Goal

| | kW | KWh | Participation | Expenses |
|--------------|--------------|--------------|---------------|--------------|
| C&I | 59.5% | 55.3% | 50.2% | 51.6% |
| IE | 98.4% | 73.8% | 69.6% | 58.0% |
| Resi | 92.9% | 81.7% | 105.4% | 66.4% |
| Total | 73.2% | 68.9% | 104.5% | 56.6% |

Progress Towards Electric Goals 2015 & 2016 by Quarter



Gas Sector Results

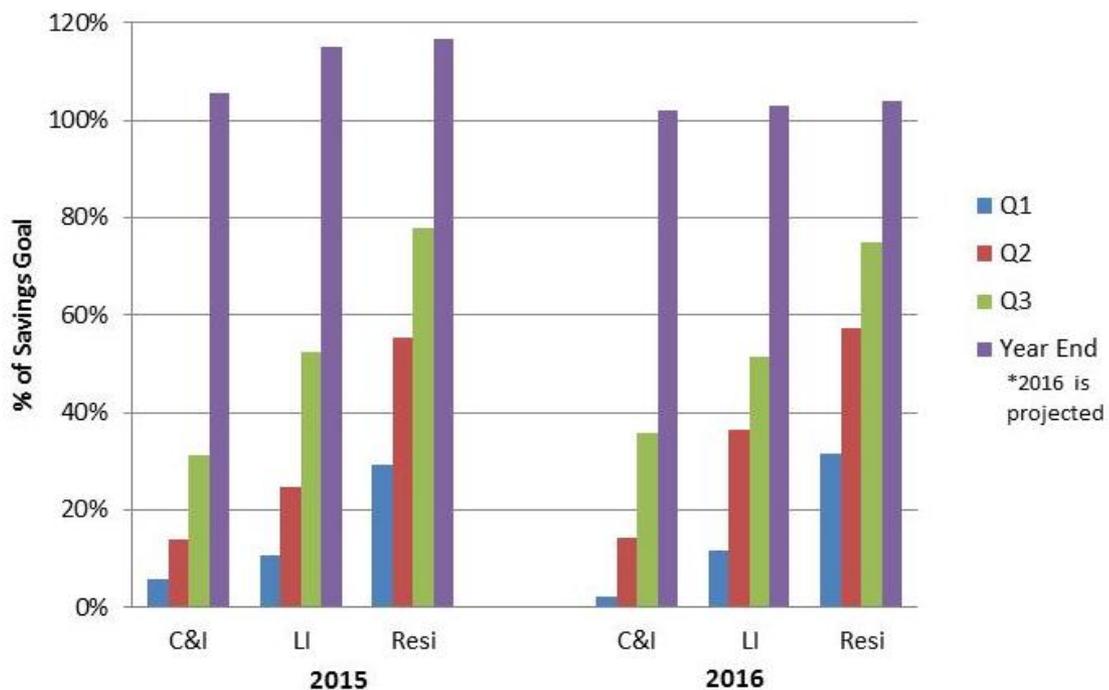
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Progress Towards Filed 2016 Goal

| | MMBtu | Participation | Expenses |
|--------------|--------------|---------------|--------------|
| C&I | 35.9% | 39.4% | 39.4% |
| IE | 51.6% | 59.8% | 52.1% |
| Resi | 75.0% | 96.8% | 63.8% |
| Total | 54.5% | 95.1% | 52.7% |

Progress Towards Gas Goals 2015 & 2016 by Quarter



Rhode Island Energy Efficiency

Third Quarter 2016 | National Grid

November 3rd, 2016

Overview

During the third quarter, National Grid built upon the momentum from the first half of the year and is forecasting to finish 2016 strong. Most programs are on track to meet savings goal while EnergyWise on the electric side and Income-eligible Single Family on the gas side have already exceeded their 2016 savings goals.

Residential programs continued to have strong performance in the third quarter. Residential New Construction completed 158 new units and EnergyWise completed 7,278 audits and 2,006 weatherization jobs. New product delivery channels and marketing efforts were developed in the residential lighting program. Cross program integration is explored through adding two new email modules in the Home Energy Reports program to promote the refrigerator recycling rebate program and highlight a new DemandLink program. In addition, the RI Energy Challenge: Find Your Four! continues to make great strides in promoting energy efficiency: Towns of Tiverton and Little Compton both successfully completed the Energy Challenge with 448 Tiverton residents and 199 Little Compton residents pledging to be more efficient.

The Commercial and Industrial sector programs gained great momentum in the third quarter. The program is expected to meet both the electric and the gas savings goal. The State System Energy Management Project (SEMP) is being carried out as planned. The Company is working with the small business program lead vendor to launch SolarWise to the small business participants. On street lighting. Cranston has purchased street lights and is in the process of replacing their street lighting with LEDs. The RI Infrastructure Bank opened up round two of Efficient Buildings Fund Application period, and the Company will be providing energy audits and engineering analysis to help public entities identify energy saving opportunities.

During the third quarter, the Company was also hard at work developing the 2017 Energy Efficiency Program Plan. The Plan looks to build upon the success of 2016 by exploring innovative savings opportunities and reaching more customers with greater savings in a highly cost-effective manner.

Overall, with increased momentum and year-end transactions nearing completion, the Company is projecting that it will reach 101% of the electric savings target and 103% of the gas savings target.

2016 Program & Initiative Updates

Residential New Construction (RNC)

The residential new construction program had a strong third quarter.

- There were 158 units completed during this quarter with 80 homes achieved Tier II and 8 achieved Tier III.
- There were 61 new units enrolled in the Program, bringing total enrollments to 398, which is 72% of the overall goal.
- The Company and the lead vendor's RNC team and the C&I Sales team developed a partnership to identify additional savings opportunities for new construction projects. Approximately 12 current and upcoming projects have been identified as opportunities for both RNC and C&I, and most will benefit from a shared approach.
- 2016 continues to have an increase in enrollments of electric heat and delivered fuel projects, which is a significant change from prior years.
- Customer success case study:
 - Enrollment Highlight:
 - In Cranston, a 45-unit project was enrolled in the second quarter and completed during the third quarter. This project achieved a HERS Index of 60, qualified for Tier II incentives and is Zero Energy Ready.



- Affordable Housing Project Highlights:
 - Southside Revitalization located on Arch, Bridgham, Lester, Broad, Public and Prairie Streets in Providence is a 26-unit new construction affordable housing project developed by SWAP (Stop Wasting Abandoned Property). The first 9 units were completed during the third quarter. These units achieved a HERS Index ranging from 54-60 and all met Tier II. All units were verified as Energy Star®.

Income Eligible

- Two Weatherization Technical Committee (WTC) meetings were held in the third quarter. Topics included the Department of Human Services (DHS) monitoring visit, gas leak protocol, AC delivery, Knob & Tube deferral and ASHRAE 62.2 implementation.
- The RI low-income Weatherization Assistance Program (WAP/IES) Operations Manual Final was distributed at the July 14 WTC meeting. The

manual contains all policies and procedures for the program, forms, appendices and client information documents needed to complete all audits.

- The RI WAP/IES Weatherization Bid process began in the third quarter and is anticipated to produce an updated price list in the fourth quarter. The Weatherization Bid will be tied to the Department of Energy's Standard Work Specification (SWS) and the RI WAP/IES Field Manual, ensuring consistent measure installation across the state.
- Mid-year review budget and performance meetings were conducted with each agency. Most agencies were at or above budget and goals. Agencies below budget or goal are implementing plans to reach budget and goals. Two agencies added extra personnel to reach goals.
- The National Grid Background Check program continued in the third quarter, with an emphasis on specialty contractors (electricians, chimney service, disaster prep, etc.). The Rhode Island DHS has collaborated with CLEAResult and requires all contractors implementing DHS funded projects to have met the requirements of the National Grid Background Check program.
- CLEAResult conducted training in the third quarter to introduce the new Second AMP process developed by National Grid.
- The first seven RI WAP/IES Auditors began the Building Performance Institute (BPI) Heating Professional Training and several received certification. This program will ensure that the front-line staff is familiar with the safety and efficiency opportunities of various heating system equipment.
- Several meetings were held with Tri-Town to prepare and implement the merger with South County Community Action Programs (CAP) in the fourth quarter.

EnergyWise

- 7,278 audits and 2006 weatherization jobs were completed through the third quarter.
- 615 loans were completed through the third quarter, totaling \$3.4 million loaned.
- Audit staff is now comprised of eight two-person teams, which allows a more thorough audit since one member of the team concentrates on direct install of efficiency improvements while the other focuses on customer education and efficiency solutions.
- The mechanical ventilation/bath fan pre-weatherization pilot has completed installations. Continued monitoring and a report of findings will follow.
- Audit staff is transitioning to tablets for audits where customers can sign electronically thereby simplifying paperwork and processing time.

EnergyWise and Income Eligible Multifamily

- The Company has begun working on an RFP for MF lead vendor services that will be released at the end of the fourth quarter.
- Benchmarking of 75 buildings by vendor New Ecology and Wegowise

continued through the third quarter.

- Market rate electric has seen strong gains and is on track for goal. There has been a slight slowdown in market rate gas.
- Income Eligible Electric had strong performance through the third quarter and is expected to surpass goal during the fourth quarter. The Income Eligible gas program saw increases in pipeline performance and savings through the third quarter.
- Continued strong performance through the third quarter has led nearing savings goal in C&I Gas.

ENERGYSTAR® Lighting and Appliances

- An online pilot with Home Depot for sales of Ecosmart LEDs began at the end of August.
- Efforts are also underway to work with Amazon for online lighting promotions.
- The RI Energy Education Association is allowing the Company to promote the School Fundraiser Program through their email list, which will increase interest among non-participating schools.
- The appliance and consumer electronics in store survey was completed during the third quarter.
- Upstream incentives of pool pumps which began in 2016 is well supported in RI and increased sales by over 80% over 2015.
- Dehumidifiers were also popular items for purchase during the third quarter.

ENERGYSTAR® HVAC (Heating and Cooling)

- The third quarter focused on trade ally and workforce development, in terms of engaging trade allies at all tiers of the supply/delivery chain and creating opportunities for program promotion and training.
- Strategies below were developed for increasing year-end program production:
 - Cross promotion of gas program through Find Your Four! communications.
 - Marketing push on t-stats and heating systems.
 - Email blasts sent to home energy assessment customers who expressed interest in gas water heaters/heating systems during energy assessment.
 - In-store instant rebates.
 - Hosting quarterly meetings with contractors.

Home Energy Reports

- During the third quarter, the Home Energy Report program helped customers save 8,358 MWh and 66,206 Therms.
- Digital engagement was slightly up from last quarter, with an average email open rate of 35% compared to 31% the previous quarter. The click-through rate was slightly down from last quarter with a rate of 1.9% compared to 2.3% the previous quarter.

- The third quarter customer experience consisted of the standard neighbor comparison, twelve-month comparison, various personalized energy efficiency tips, and modules to promote National Grid energy efficiency programs.
- In the third quarter, the program design was altered to provide a boost in savings for electric usage. These changes included adding an extra report in August and turning on eHERs for all customers who had provided email addresses.
- In addition to the changes in the number of reports, the program added two new email modules to promote a refrigerator recycling rebate program and highlight a new DemandLink program that National Grid is running for a subset of its customers.

Community Initiative

- In the third quarter, the towns of Tiverton and Little Compton successfully completed the Energy Challenge with 448 Tiverton Residents pledging to be more efficient and 199 Little Compton residents doing the same.
- To support the DemandLink program currently underway in Tiverton and Little Compton, residential audits were a primary focus of community communications. By the end of campaign, 100 audit requests came through the program.
- Both towns of Barrington and Bristol passed resolutions to support the Energy Challenge and began participating as the 5th and 6th communities of the year.

Codes Initiative

- The adoption process for the new code continues to be at a standstill. A recently enacted Executive Order requires all sections of the code to undergo an economic analysis by the Office of Regulatory Reform (ORR). The energy code was selected first and successfully made its way through this process. However, progress on the remaining codes has come to a halt. The state is now issuing an RFP to identify a third party to assist with this analysis. As the building commission intends to adopt all building codes as one, the timeline for adoption of the energy code is very uncertain and will likely not occur until 2017.



- CCEI continued to promote and support Circuit Rider services and infield trainings during the third quarter. 7 Circuit Rider phone calls were received (6 residential and 1 commercial), and 1 residential Circuit Rider site visit took place. Two residential infield trainings were held for contractors

addressing blower door and duct testing methods and requirements. Two onsite trainings were held for Vocational School students addressing code performance requirements in various states and how test results determine whether or not a house passes.

- A classroom training was held in August highlighting upcoming changes to the commercial energy code, and two tours took place at the University of Rhode Island.

Large Commercial New Construction

- The program is on track to meet its electric and gas goals. Most gas savings are expected to be claimed in the November/December timeframe. Many post inspections were delayed due to warm weather as heat must be on to post inspect.
- Both upstream lighting and upstream HVAC are expected to meet the savings goals.
- In September, 19/21 participants from the Building Operator Certificate (BOC) class took the new comprehensive certification exam.
- Cranston has purchased street lights and is in the process of replacing their street lighting with LEDs. The PUC decision on the company-owned tariff has been extended 60 days. The metering pilot is on hold.

Large Commercial Retrofit

- The State System Energy Management Project (SEMP) was signed in the second quarter. Projects are being carried out as planned.
- The RI Infrastructure Bank opens up round two of Efficient Buildings Fund Application Period, and the Company will be providing energy audits and engineering analysis to help public entities identify energy saving opportunities. RI Department of Education (RIDE) has recently completed audits on all their public schools. The Company will now assist them in identifying program participation opportunities.
- As of the third quarter, three Combined Heat and Power (CHP) projects, including two manufacturers and one hotel, are under construction. Four other CHPs are currently under investigation.

Small Business Direct Install

- The small business program is moving forward as planned. The Company is working with the lead vendor to launch SolarWise to the small business participants in October 2016.

Pilots

- Through the third quarter, there have been 339 Connected Solutions thermostats signed up for the pilot. There will be another email push in the fall to recruit new participants.
- The Zero Energy Building Taskforce has wrapped up their task force meetings and will submit a white paper in the fourth quarter.

Evaluation

- The C&I Custom Process study is moving forward with metering completed in some sites. Calculation and reporting are in process.
- Metering is complete for some sites for the C&I Custom HVAC study. Calculation and reporting are in process.
- The C&I Energy Code Compliance Study is completed. The state-wide compliance rate has increased from 78% in the 2012 baseline study to 86%, indicating that compliance of newly constructed buildings is improving over time, even as the code gets more stringent.
- The C&I On-Bill Repayment evaluation is completed.
- The evaluation of the Large C&I Electric On-Bill Repayment program is completed. The study found the programs adheres to industry standards and customers are satisfied with the program. The Company will work towards implementing recommendations from the study over the next year.

Upcoming Events:

- The AESP Northeast Chapter NEEC Annual Conference will be held on November 7th in Framingham, MA.

NATIONAL GRID ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table 1. Summary of Electric 2016 Target and Preliminary 3rd Quarter Results

| ELECTRIC PROGRAMS Sector and Program | (1) (2) (3) (4) Demand Reduction (Annual kW) | | | | (5) (6) (7) (8) Energy Savings (Annual MWh) | | | | (9) (10) (11) Customer Participation | | | (12) (13) (14) Expenses (\$ 000) | | | (15) (16) (17) | | |
|---|---|---------------|-----------------|------------------|--|----------------|-----------------|------------------|---|----------------|-----------------|-------------------------------------|--------------------|-----------------|-----------------------------|-----------------|-------------------|
| | Year To Target | Date | Pct Achieved | Pct Projected | Year To Target | Date | Pct Achieved | Pct Projected | Year To Target | Date | Pct Achieved | Budget | Year To Date | Pct Achieved | Lifetime savings, MWh | \$/kWh | Planned \$/kWh |
| Commercial and Industrial | | | | | | | | | | | | | | | | | |
| Large Commercial New Construction | 1,540 | 1,004 | 65.2% | | 15,728 | 5,102 | 32.4% | | 209 | 135 | 64.6% | \$6,864.1 | \$3,458.5 | 50.4% | 76,757 | \$ 0.045 | \$ 0.030 |
| Large Commercial Retrofit | 13,906 | 7,768 | 55.9% | | 67,030 | 37,080 | 55.3% | | 3,540 | 1,557 | 44.0% | \$22,545.5 | \$9,246.0 | 41.0% | 403,588 | \$ 0.023 | \$ 0.053 |
| Small Business Direct Install | 2,507 | 1,904 | 76.0% | | 12,165 | 10,292 | 84.6% | | 905 | 644 | 71.2% | \$8,745.9 | \$5,613.3 | 64.2% | 114,184 | \$ 0.049 | \$ 0.085 |
| Community Based Initiatives - C&I | | | | | | | | | | | | \$49.6 | \$27.0 | 54.5% | | | |
| Commercial Demonstration and R&D | | | | | | | | | | | | \$296.2 | \$49.3 | 16.6% | | | |
| Finance Costs | | | | | | | | | | | | \$3,000.0 | N/A | N/A | | | |
| SUBTOTAL | 17,953 | 10,676 | 59.5% | 98.0% | 94,922 | 52,474 | 55.3% | 100.0% | 4,654 | 2,336 | 50.2% | \$41,501.2 | \$18,394.0 | 44.3% | 594,529 | \$ 0.031 | \$ 0.055 |
| Income Eligible Residential | | | | | | | | | | | | | | | | | |
| Single Family - Income Eligible Services | 554 | 543 | 98.1% | | 4,061 | 3,110 | 76.6% | | 2,500 | 2,074 | 83.0% | \$8,656.1 | \$5,068.6 | 58.6% | 37,681 | \$ 0.135 | \$ 0.213 |
| Income Eligible Multifamily | 117 | 117 | 100.0% | | 2,830 | 1,977 | 69.8% | | 5,100 | 3,216 | 63.1% | \$2,531.3 | \$1,422.9 | 56.2% | 16,852 | \$ 0.084 | \$ 0.102 |
| SUBTOTAL | 671 | 660 | 98.4% | 100.0% | 6,891 | 5,086 | 73.8% | 103.0% | 7,600 | 5,290 | 69.6% | \$11,187.4 | \$6,491.5 | 58.0% | 54,533 | \$ 0.119 | \$ 0.170 |
| Non-Income Eligible Residential | | | | | | | | | | | | | | | | | |
| Residential New Construction | 83 | 61 | 74.0% | | 1,213 | 354 | 29.2% | | 512 | 318 | 62.1% | \$736.9 | \$394.4 | 53.5% | 5,711 | \$ 0.069 | \$ 0.071 |
| ENERGY STAR® HVAC | 235 | 236 | 100.2% | | 1,011 | 796 | 78.7% | | 902 | 1,280 | 141.8% | \$1,219.0 | \$870.0 | 71.4% | 9,980 | \$ 0.087 | \$ 0.138 |
| EnergyWise | 1,701 | 1,877 | 110.3% | | 11,729 | 12,680 | 108.1% | | 8,890 | 8,246 | 92.8% | \$10,007.7 | \$7,267.5 | 72.6% | 116,241 | \$ 0.063 | \$ 0.095 |
| EnergyWise Multifamily | 185 | 149 | 80.4% | | 4,061 | 2,510 | 61.8% | | 4,400 | 6,128 | 139.3% | \$3,319.1 | \$1,796.5 | 54.1% | 23,197 | \$ 0.077 | \$ 0.095 |
| ENERGY STAR® Lighting | 5,049 | 4,428 | 87.7% | | 43,098 | 38,188 | 88.6% | | 233,992 | 274,740 | 117.4% | \$7,362.1 | \$5,139.2 | 69.8% | 361,505 | \$ 0.014 | \$ 0.030 |
| Residential Consumer Products | 696 | 485 | 69.7% | | 4,647 | 2,713 | 58.4% | | 14,095 | 22,261 | 157.9% | \$2,085.0 | \$1,036.4 | 49.7% | 17,148 | \$ 0.060 | \$ 0.080 |
| Home Energy Reports | 3,759 | 3,641 | 96.8% | | 32,186 | 22,754 | 70.7% | | 294,013 | 274,176 | 93.3% | \$2,796.7 | \$2,042.4 | 73.0% | 22,754 | \$ 0.090 | \$ 0.087 |
| Energy Efficiency Educational Programs | | | | | | | | | | | | \$40.1 | \$40.0 | 99.8% | | | |
| Residential Demonstration and R&D | | | | | | | | | | | | \$488.1 | \$87.3 | 17.9% | | | |
| Community Based Initiatives - Residential | | | | | | | | | | | | \$284.4 | \$162.1 | 57.0% | | | |
| Comprehensive Marketing - Residential | | | | | | | | | | | | \$534.0 | \$328.6 | 61.5% | | | |
| SUBTOTAL | 11,708 | 10,876 | 92.9% | 100.0% | 97,947 | 79,996 | 81.7% | 102.0% | 556,804 | 587,149 | 105.4% | \$28,873.1 | \$19,164.4 | 66.4% | 556,536 | \$0.034 | \$ 0.055 |
| Regulatory | | | | | | | | | | | | | | | | | |
| EERMC | | | | | | | | | | | | \$793.1 | \$335.9 | 42.4% | | | |
| OER | | | | | | | | | | | | \$793.1 | \$526.6 | 66.4% | | | |
| RI Infrastructure Bank | | | | | | | | | | | | \$1,441.5 | \$0.0 | 0.0% | | | |
| SUBTOTAL | | | | | | | | | | | | \$3,027.7 | \$862.5 | 28.5% | | | |
| TOTAL | 30,332 | 22,213 | 73.2% | 100.0% | 199,760 | 137,556 | 68.9% | 101.0% | 569,058 | 594,775 | 104.5% | \$ 84,589.4 | \$ 44,912.5 | 53.1% | 1,205,598 | \$ 0.037 | \$ 0.061 |
| <i>RGGI</i> | | | | | | | | | | | | \$ 772.8 | \$264.9 | 34.3% | | | |
| <i>System Reliability Procurement</i> | | | | | | | | | | | | \$ 441.1 | \$269.5 | 61.1% | | | |

NOTES
(1)(5)(9) Targets from Docket 4580 - Attachment 5, Table E-7 (electric)
(3) Pct Achieved is Column (2)/ Column (1).
An error was found in kW planning for the ENERGY STAR® Lighting program. The filed goal was 3,620 kW and the filed Residential Sector goal was 10,673 kW. The correct kW goal is reflected in the tables above. The Company will use the corrected Residential Sector kW goal for its year-end incentive calculation.
An error was found in kW planning for the multifamily programs. The filed EnergyWise Multifamily goal was 579 and the filed Residential Sector goal was 10,673 kW. The filed Income Eligible Multifamily goal was 366 kW and the filed Income Eligible Sector goal was 920 kW. The correct kW goals are reflected in the tables above. The Company will use the corrected Residential Sector and Income Eligible kW goals for its year-end incentive calculation.
(7) Pct Achieved is Column (6)/ Column (5).
Savings from the Codes and Standards initiative are not counted until year-end. Therefore, savings in the Commercial and Residential New Construction Programs may track lower each quarter.
(9) Participation was planned and is reported in 'net' terms which takes into account free-ridership and spillover.
(11) Pct Achieved is Column (10)/ Column (9).
(12) Approved Budget includes Implementation and Evaluation budgets from Docket 4580, Attachment 5 Table E-2 (electric).
EnergyWise Budget includes \$1M in RGGI funding for delivered fuels weatherization per Section IV.A.2 in Docket 4580.
(13) Year To Date Expenses include Implementation and Evaluation expenses.
\$3,000,000 in finance funds were transferred as authorized to the Large C&I Electric Revolving Loan Fund. Please see Table 3.
RGGI Expenses are counted separate as those funds were not part of the approved 2016 budget. Details on RGGI spend are found in Table 4.
(14) Pct Achieved is Column (13)/ Column (12).
(16) \$/lifetime kWh = Column (13)/Column (15)
(17) Planned \$/lifetime kWh - Attachment 5, Table E-5 (electric)
System Reliability Procurement targets from Docket 4581, not included in Expenses Total

NATIONAL GRID ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table 2. Summary of Gas 2016 Target and Preliminary 3rd Quarter Results

| GAS PROGRAMS Sector and Program | (1) (2) (3) (4) Energy Savings (MMBtu) | | | | (5) (6) (7) Customer Participation | | | (8) (9) (10) Expenses (\$ 000) | | | (11) | (12) | (13) |
|---|---|----------------|--------------|---------------|---------------------------------------|----------------|--------------|-----------------------------------|--------------------|--------------|-------------------------|-------------------|---------------------------|
| | Approved Target | Year To Date | Pct Achieved | Pct Projected | Approved Target | Year To Date | Pct Achieved | Approved Budget | Year To Date | Pct Achieved | Lifetime savings, MMBtu | \$/Lifetime MMBtu | Planned \$/Lifetime MMBtu |
| Commercial and Industrial | | | | | | | | | | | | | |
| Large Commercial New Construction | 43,424 | 19,276 | 44.4% | | 152 | 93 | 61.3% | \$1,694.7 | \$711.3 | 42.0% | 372,982 | \$ 1.91 | \$ 2.99 |
| Large Commercial Retrofit | 133,613 | 41,635 | 31.2% | | 234 | 129 | 55.1% | \$4,871.1 | \$1,696.0 | 34.8% | 331,123 | \$ 5.12 | \$ 6.39 |
| Small Business Direct Install | 3,667 | 719 | 19.6% | | 133 | 22 | 16.5% | \$282.4 | \$84.1 | 29.8% | 5,196 | \$ 16.18 | \$ 8.29 |
| Commercial & Industrial Multifamily | 9,490 | 6,626 | 69.8% | | 1,611 | 595 | 36.9% | \$754.7 | \$221.7 | 29.4% | 99,877 | \$ 2.22 | \$ 6.52 |
| Commercial Demonstration and R&D | | | | | | | | \$97.3 | \$13.8 | 14.2% | | | |
| Community Based Initiatives - C&I | | | | | | | | \$6.4 | \$3.4 | 52.9% | | | |
| Finance Costs | | | | | | | | \$500.0 | N/A | N/A | | | |
| SUBTOTAL | 190,194 | 68,256 | 35.9% | 102.0% | 2,131 | 839 | 39.4% | \$8,206.6 | \$2,730.2 | 33.3% | 809,178 | \$ 3.37 | \$ 5.32 |
| Income Eligible Residential | | | | | | | | | | | | | |
| Single Family - Income Eligible Services | 9,368 | 10,055 | 107.3% | | 500 | 486 | 97.2% | \$3,285.5 | \$2,430.1 | 74.0% | 201,096 | \$ 12.08 | \$ 17.54 |
| Income Eligible Multifamily | 19,915 | 5,055 | 25.4% | | 3,000 | 1,607 | 53.6% | \$2,063.3 | \$358.8 | 17.4% | 70,717 | \$ 5.07 | \$ 5.80 |
| SUBTOTAL | 29,283 | 15,110 | 51.6% | 103.0% | 3,500 | 2,093 | 59.8% | \$5,348.8 | \$2,788.9 | 52.1% | 271,813 | \$ 10.26 | \$ 9.85 |
| Non-Income Eligible Residential | | | | | | | | | | | | | |
| EnergyWise | 68,117 | 59,162 | 86.9% | | 2,710 | 2,546 | 93.9% | \$6,929.5 | \$5,217.5 | 75.3% | 1,305,803 | \$ 4.00 | \$ 5.45 |
| Energy Star® HVAC | 26,064 | 9,637 | 37.0% | | 2,099 | 876 | 41.7% | \$1,619.2 | \$761.2 | 47.0% | 163,686 | \$ 4.65 | \$ 10.19 |
| EnergyWise Multifamily | 17,208 | 7,420 | 43.1% | | 2,625 | 2,003 | 76.3% | \$1,978.6 | \$688.8 | 34.8% | 119,369 | \$ 5.77 | \$ 8.24 |
| Home Energy Reports | 53,989 | 52,897 | 98.0% | | 135,689 | 133,340 | 98.3% | \$436.6 | \$355.4 | 81.4% | 52,897 | \$ 6.72 | \$ 8.09 |
| Residential New Construction | 10,907 | 3,068 | 28.1% | | 375 | 194 | 51.7% | \$836.9 | \$553.4 | 66.1% | 76,599 | \$ 7.22 | \$ 4.61 |
| Residential Demonstration and R&D | | | | | | | | \$81.3 | \$0.2 | 0.2% | | | |
| Comprehensive Marketing - Residential | | | | | | | | \$69.8 | \$45.0 | 64.5% | | | |
| Community Based Initiatives - Residential | | | | | | | | \$25.8 | \$15.4 | 59.8% | | | |
| SUBTOTAL | 176,284 | 132,184 | 75.0% | 104.0% | 143,498 | 138,959 | 96.8% | \$11,977.7 | \$7,636.9 | 63.8% | 1,718,354 | \$ 4.44 | \$ 6.65 |
| Regulatory | | | | | | | | | | | | | |
| EERMC | | | | | | | | \$233.3 | \$109.8 | 47.1% | | | |
| OER | | | | | | | | \$233.3 | \$152.6 | 65.4% | | | |
| RI Infrastructure Bank | | | | | | | | \$429.0 | \$0.0 | 0.0% | | | |
| SUBTOTAL | | | | | | | | \$895.5 | \$262.5 | 29.3% | | | |
| TOTAL | 395,760 | 215,549 | 54.5% | 103.0% | 149,129 | 141,891 | 95.1% | \$ 26,428.6 | \$ 13,418.5 | 50.8% | 2,799,345 | \$ 4.79 | \$ 6.66 |

NOTES
(1)(5) Targets from Docket 4580 - Attachment 6, Table G-7 (gas).
(3) Pct Achieved is Column (2)/ Column (1).
Savings from the Codes and Standards initiative are not counted until year-end. Therefore, savings in the Commercial and Residential New Construction Programs may track lower each quarter.
(4) Participation was planned and is reported in 'net' terms which takes into account free-ridership and spillover.
(7) Pct Achieved is Column (6)/ Column (5).
(8) Approved Budget includes Implementation and Evaluation budgets from Docket 4580, Attachment 6 Table G-2 (gas).
(9) Year To Date Expenses include Implementation and Evaluation expenses.
\$500,000 in finance funds were transferred as authorized to the C&I Gas Revolving Loan Fund. Please see Table 3.
(10) Pct Achieved is Column (9)/ Column (8).
(12) \$/lifetime MMBtu = Column (9)*1000/Column (11)
(13) Planned \$/lifetime MMBtu - Attachment 6, Table G-5 (gas).

**Table 3
National Grid
Revolving Loan Funds**

Large C&I Electric Revolving Loan Fund

| | | |
|-----|----------------------|--------------------|
| (1) | 2016 Funds Available | \$14,115,728 |
| (2) | 2016 Loan budget | \$11,000,000 |
| (3) | Committed | \$5,829,462 |
| (4) | Paid | \$2,499,578 |
| (5) | Number of loans | 46 |
| (6) | Participants | 28 |
| (7) | Savings (MWh) | 8,128 |
| (8) | Available | <u>\$2,670,960</u> |

Small Business Electric Revolving Loan Fund

| | | |
|-----|----------------------|-------------------|
| (1) | 2016 Funds Available | \$2,242,136 |
| (2) | 2016 Loan Budget | \$2,870,000 |
| (3) | Committed | \$577,215 |
| (4) | Paid | \$2,604,749 |
| (6) | Participants | 994 |
| (7) | Savings (MWh) | 10,292 |
| (8) | Available | <u>-\$311,964</u> |

Rhode Island Public Energy Partnership (RI PEP)

| | | |
|------|----------------------|------------------|
| (9) | 2016 Funds Available | \$993,365 |
| (10) | Committed | \$88,361 |
| (11) | Paid | \$380,278 |
| (12) | Repayments | \$243,790 |
| (13) | Participants | 5 |
| (14) | Savings (MWh) | 1,364 |
| (15) | Available | <u>\$768,516</u> |

C&I Gas Revolving Loan Fund

| | | |
|-----|----------------------|--------------|
| (1) | 2016 Funds Available | \$1,682,732 |
| (2) | 2016 Loan budget | \$1,600,000 |
| (3) | Committed | \$939,000 |
| (4) | Paid | \$660,702 |
| (6) | Participants | 7 |
| (7) | Savings (MMBtu) | 16,934 |
| (8) | Available | <u>\$298</u> |

Notes

- ¹ Amount available as of January 1, 2016, including 2016 fund injections detailed in Table E-10 and G-10. The C&I Gas Loan Fund also includes the injection of \$300,000 as approved by the EE Collaborative on March 21, 2016.
- ² Budget adopted by Sales Team for 2016 operations. Budget includes projections of repayments made during 2016.
- ³ As of September 30, 2016
- ⁴ As of September 30, 2016
- ⁵ As of September 30, 2016
- ⁶ Unique customer names for large business and customer accounts for small business (not adjusted for net-to-gross).
- ⁷ As of September 30, 2016
- ⁸ Available funds as of September 30, 2016 not including repayments.
- ⁹ Funds available as of January 1, 2016
- ¹⁰ As of September 30, 2016
- ¹¹ As of September 30, 2016
- ¹² As of September 30, 2016
- ¹³ As of September 30, 2016 - 5 entities with 18 applications.
- ¹⁴ As of September 30, 2016
- ¹⁵ Available funds as of September 30, 2016

Table 4
2016 RGGI Budget and Spend

| Initiative | 2016 Budget | Spend |
|---|--------------------|-------------------|
| RI Public Energy Partnership Incentives | \$ 517,340 | \$ 254,824 |
| Agricultural Delivered Fuels | \$ 255,446 | \$ 10,054 |
| Total | \$ 772,786 | \$ 264,878 |

Notes

1. Budgets may differ from quarterly and annual RGGI reports delivered to the Office of Energy Resources as they represent funds available for program year 2016, net of previous year's spend.
2. Table only includes RGGI funds for specific initiatives. Does not include funds allocated to lowering the energy efficiency program charge or those allocated to loan funds.

EERMC 2016 Budget - Quarter 3 Report

Last Updated 11/10/2016

| Income | |
|-------------------------------|---------------------|
| 2015 Carry Over - Client Fund | \$ 242,080 |
| SBC - Electric (2016) | \$ 793,100 |
| SBC - Gas (2016) | \$ 233,300 |
| TOTAL INCOME | \$ 1,268,480 |

| Expenses to Main Account | Budget | Expense | | | | Total Expended | | Total Remaining | | Projected EOY Balance | |
|---------------------------------|----------------------|----------------------|----------------------|----------------------|------------------|----------------------|--------------|----------------------|--------------|-----------------------|-------------|
| | CY 2016 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | \$ | % | \$ | % | \$ | % |
| Consultant Services | \$ 830,450.00 | \$ 107,205.97 | \$ 254,111.04 | \$ 225,153.91 | \$ - | \$ 586,470.92 | 70.6% | \$ 243,979.08 | 29.4% | \$ - | 0.0% |
| Core allocation | \$ 770,450.00 | \$ 104,621.54 | \$ 252,035.00 | \$ 224,513.75 | \$ - | \$ 581,170.29 | 75.4% | \$ 189,279.71 | 24.6% | \$ - | 0.0% |
| Travel/Expenses | \$ 5,000.00 | \$ 2,584.43 | \$ 2,076.04 | \$ 640.16 | \$ - | \$ 5,300.63 | 106.0% | \$ (300.63) | -6.0% | \$ - | 0.0% |
| Supplemental Budget | \$ 55,000.00 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.0% | \$ 55,000.00 | 100.0% | \$ - | 0.0% |
| Legal Counsel | \$ 40,000.00 | \$ 4,230.00 | \$ 5,630.00 | \$ 4,825.00 | \$ - | \$ 14,685.00 | 36.7% | \$ 25,315.00 | 63.3% | \$ 15,000.00 | 37.5% |
| Communications | \$ 15,000.00 | \$ - | \$ - | \$ 2,507.48 | \$ - | \$ 2,507.48 | 16.7% | \$ 12,492.52 | 83.3% | \$ 12,492.52 | 83.3% |
| Council Travel | \$ 500.00 | \$ 106.05 | \$ 106.05 | \$ 106.05 | \$ - | \$ 318.15 | 63.6% | \$ 181.85 | 36.4% | \$ - | 0.0% |
| Energy Expo 2016 | \$ 50,000.00 | \$ - | \$ 50,000.00 | \$ - | \$ - | \$ 50,000.00 | 100.0% | \$ - | 0.0% | \$ - | 0.0% |
| EERMC Interns | \$ - | \$ 3,328.63 | \$ - | \$ - | \$ - | \$ 3,328.63 | | \$ (3,328.63) | | \$ (3,328.63) | |
| Member Retreat | \$ 1,000.00 | \$ - | \$ - | \$ - | \$ 505.42 | \$ 505.42 | 50.5% | \$ 494.58 | 49.5% | \$ - | 0.0% |
| Stretch Code Development | \$ 50,260.00 | \$ - | \$ - | \$ - | \$ - | \$ - | 0.0% | \$ 50,260.00 | 100.0% | \$ - | 0.0% |
| Subtotal | \$ 987,210.00 | \$ 114,870.65 | \$ 309,847.09 | \$ 232,592.44 | \$ 505.42 | \$ 657,815.60 | 66.6% | \$ 329,394.40 | 33.4% | \$ 24,163.89 | 2.4% |

| | | |
|--------------------|---------------------|---------------------|
| Unallocated | \$ 39,190.00 | \$ 39,190.00 |
|--------------------|---------------------|---------------------|

| Expenses to Client Fund | Budget | Expense | | | | Total Expended | | Total Remaining | | Projected EOY Balance | |
|----------------------------------|----------------------|---------------------|---------------------|--------------------|--------------------|----------------------|--------------|--------------------|-------------|-----------------------|-------------|
| | CY 2016 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | \$ | % | \$ | % | \$ | % |
| Finance Study, Dunsy | \$ 70,000.00 | \$ 35,000.00 | \$ 28,000.00 | \$ - | \$ 7,000.00 | \$ 70,000.00 | 100.0% | \$ - | 0.0% | \$ - | 0.0% |
| Energy Expo 2015 | \$ 50,000.00 | \$ 50,000.00 | \$ - | \$ - | \$ - | \$ 50,000.00 | 100.0% | \$ - | 0.0% | \$ - | 0.0% |
| Synapse - Demand Response | \$ 20,000.00 | \$ - | \$ 15,351.61 | \$ 1,965.00 | \$ 95.00 | \$ 17,411.61 | 87.1% | \$ 2,588.39 | 12.9% | \$ - | 0.0% |
| Subtotal | \$ 140,000.00 | \$ 85,000.00 | \$ 43,351.61 | \$ 1,965.00 | \$ 7,000.00 | \$ 137,411.61 | 98.2% | \$ 2,588.39 | 1.8% | \$ - | 0.0% |

| | | | | |
|--------------------|----------------------|-----------------------------|----------------------|----------------------|
| Unallocated | \$ 102,080.30 | Current Fund Balance | \$ 104,668.69 | \$ 102,080.30 |
|--------------------|----------------------|-----------------------------|----------------------|----------------------|

| | | | | | | | | | | |
|---------------|------------------------|----------------------|----------------------|----------------------|--------------------|----------------------|-------------|----------------------|------------|----------------------|
| TOTALS | \$ 1,127,210.00 | \$ 199,870.65 | \$ 353,198.70 | \$ 234,557.44 | \$ 7,505.42 | \$ 795,227.21 | 165% | \$ 331,982.79 | 35% | \$ 165,434.19 |
|---------------|------------------------|----------------------|----------------------|----------------------|--------------------|----------------------|-------------|----------------------|------------|----------------------|

SUMMARY

- \$1,026,400 System benefit funds available to the EERMC for 2016
- \$ 242,080 Amount carried over from 2015 budget into attorney's client fund
- \$1,268,480 Total available to the EERMC at the beginning of 2016
- \$1,127,210 Total allocated in 2016
- \$ 141,270 Total unallocated in 2016
- \$ 165,434 Projected end-of-year balance plus unallocated

EERMC 2017 Budget - DRAFT

Last Updated 11/10/2016

| Income | | |
|--------|-------------------------------|---------------------|
| | 2016 Carry Over - Client Fund | \$ 102,080 |
| | SBC - Electric (2016) | \$ 816,300 |
| | SBC - Gas (2016) | \$ 304,300 |
| | TOTAL INCOME | \$ 1,222,680 |

| 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 | \$ 12,080.30 |
|--------------------|---------------------|

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

| | |
|--------------------|----------------------|
| Unallocated | \$ 220,730.30 |
|--------------------|----------------------|

ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL/NATIONAL GRID 2017 ENERGY EXPO SPONSORSHIP PACKAGE

- Inclusion in the Home Show's \$120,000 advertising campaign; TV, Radio, Print, direct mail, e-mail blasts, etc.
 - Sponsor's logos will be shown in all TV commercials and sponsors will be mentioned in all the voice-over of all TV commercials.
 - Sponsor's will be mentioned in all radio commercials
 - Sponsor's logos will appear in all print ads, direct mail collateral and e-mail blasts
 - Sponsor mentions will be included in the social media campaign including "shout outs" and "tweets" promoting the Energy Expo, seminars and on-floor demonstrations
- Sponsor's logos to be displayed "above-the-fold" on the Show's website.
- Additional TV & Radio spots promoting just the Energy Expo and Sponsors
- Each Sponsor will receive individualized coupons to include with mailings to each of the sponsor's customers
- Opening night reception for invited guests for approx. 50 people.
- Show signage
- Home Energy Audits promoted throughout the Show
- 2,000 Guest tickets
- Sponsor will receive 50 one day parking passes
- Inclusion in press releases, all press releases will be approved by the sponsors prior to publication
- Website and all social media networking
- All "identified" Energy Expo Exhibitors will be highlighted in the Show's interactive floor plan
- Allocated exhibit space on the show floor for educational exhibits
- Placement of energy related exhibits in the "Energy Expo Pavilion"
- Allocated floor space for live demonstrations
- Energy Expo floor decals (3'x3') displayed in front of every "identified" Energy Expo Exhibitor
- Inclusion in the Show Directory
- Co-Sponsorship of an Energy-related feature (Solar Powered Greenhouse)
- Inclusion in the Feature "Show House" wherever possible
- OEM Hosted Ride & Drive of alternative fuel vehicles if possible
- Seminars and speaker opportunities
- Coupon link to be included in each sponsor's website
- Promoted children's activities

TOTAL SPONSORSHIP FEE: \$100,000

Sponsored by



450 Veterans Memorial Pkwy. #301
East Providence, RI 02914
401.438.7400

PROPOSAL LETTER:

EFFICIENCY FINANCING PROGRAM CONSULTING SERVICES

PREPARED BY:
DUNSKY ENERGY CONSULTING

Contact: Alex Hill
alex.hill@dunsky.com
514-504-9030 ext. 30

Submitted to: Rhode Island Energy Efficiency & Resource
Management Council

Submitted date: October 17, 2016



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DUNSKY ENERGY CONSULTING

Dunsky Energy Consulting is specialized in the design, evaluation and analytical support for leading energy efficiency and renewable energy programs, plans and policies. Our mission is to contribute to an efficient and sustainable energy future by providing top level consulting services to the full breadth of energy decision-makers and stakeholders. We pursue our mission by imbuing our work with three key values:

- ✓ **QUALITY:** We work tirelessly to ensure that all work is conducted to the highest possible standards, and to ensure that we are abreast of (or leading) the latest developments and innovations in our field.
- ✓ **INTEGRITY:** We believe we are duty-bound to provide our clients at all times with consistent, honest and unbiased analysis and counsel.
- ✓ **COMMITMENT:** We treat our clients as partners, committing ourselves to their objectives, being responsive to needs as they arise and going the extra mile to help them achieve their goals.

DEC's expertise is focused primarily on energy efficiency and renewable energy. Specifically:

- **POLICY & PROGRAM DESIGN: We help our clients design, implement and evaluate cutting edge EE/RE policies and programs.** We design and assess energy efficiency and renewable energy strategies, with an aim to helping our clients achieve their goals at the lowest possible cost. We do so by properly assessing the technical and economic characteristics of technologies, by reaping lessons learned from proven best practices throughout North America and beyond, by systematically identifying and understanding market barriers, and by effectively characterizing target markets and local conditions. In the final analysis, our programs generate results, because results are what we care about.
- **OPPORTUNITIES ANALYSIS: We help our clients to assess opportunities related to EE/RE technologies and services.** We help clients identify and assess new and emerging opportunities in the EE/RE space, whether they involve new technologies, advanced industry practices or improved market strategies such as financing and building labelling. Our work includes assessing energy savings potentials in buildings and beyond, conducting cost-benefit analyses, conducting market opportunity studies, and advising clients on appropriate RDD&C efforts aimed at effectively harnessing innovation to replenish the pool of EE/RE opportunities.
- **EVALUATION SERVICES: We help our clients evaluate the success of their initiatives, with a view to both consistent reporting and continuous improvement.** We conduct process and impact evaluations on EE/RE programs. We conduct building-level M&V in support of energy efficiency projects; and we support clients in developing appropriate evaluation frameworks, including reporting frameworks, that are designed not only to ensure compliance with regulatory requirements, but also to provide real value to program managers for whom success is a *forward-looking* exercise at continuous improvement.

Our work covers all market sectors and segments, with a particular emphasis on residential, commercial and institutional sectors, as well as innovative and cross-cutting (enabling) strategies such as building performance benchmarking, and innovative financing.

DUNSKY'S QUALIFICATIONS FOR EERMC'S NEEDS

Dunsky Energy Consulting is pleased to provide this brief proposal letter to continue our services in supporting the EERMC as it moves into the next phase of broadening the state's innovative financing for Energy Efficiency and Renewable Energy (EE/RE). Our proposed scope to assist the EERMC for the remainder of 2016 and 2017, focuses on three central tasks:

- **Task 1:** Contribute expertise to the design and implementation of the emerging financing programs
- **Task 2:** Follow up on recommendations from Dunsky Study / additional specific areas of investigation
- **Task 3:** Contribute to oversight of National Grid C&I finance offerings

We believe five key aspects of Dunsky's experience we help ensure the ongoing success of our work for the EERMC:

- (1) **KNOWLEDGE OF RHODE ISLAND'S EE FINANCING LANDSCAPE:** In early 2015 Dunsky completed a review of EE/RE finance programs offered in Rhode Island for the EERMC. As part of its due diligence our team (led by Dunsky Senior Consultant & Principal Alex Hill) interviewed key stakeholders from across the state including National Grid and leading commercial and industrial customers. We also evaluated the strengths and weaknesses of Rhode Island's finance programs. Facilitating the stakeholder dialogues on behalf of the EERMC provided us with a unique opportunity to understand and engage with Rhode Island's EE/RE financing objectives and challenges, the interrelationship among key players (NGrid, OER, RIIB, consumer groups, etc.), available program performance data (and gaps), and emerging opportunities, which led to the recommendations contained within our 2015 memo.

For the past year, Dunsky has assisted the EERMC by providing financing expertise to help guide the implementation of the recommendations made in our 2015 memo. This has included:

- a. Following the development of new and existing EE financing programs (C-PACE, R-PACE, OBF, EBF and HEAT Loans), and tracking progress toward the recommendations made in our 2015 report for the EERMC. This has included regular communication with RIIB, OER, National Grid staff and the consultant -team members to gather information and understand challenges faced and progress made.
- b. Providing recommendations and reviewing the evaluations of the EnergyWise/HEAT Loan, and the Larger Commercial OBF programs. This has included providing recommendations on the research approach, proven best practices, written feedback and interpretation of the draft results reports.
- c. Reviewing the EE financing program requests in the 2017 EE Plan and providing feedback to assist the EERMC and its consultant team to arrive at an appropriate level of funding for each program.

- d. Assessing the trajectory of Rhode Island's EE financing efforts as they grow from \$13M per year in 2014, to near \$40M in 2017 (projected) and preparing a memo that quantifies increased financing on energy savings targets in the next 3-year plan.

Our team will continue to be led by Alex Hill (managing and authoring the key memos) with Martin Poirier (providing 15+ years of EE program design and evaluation – with a specialty on evaluating financing programs), Jerome Bilodeau (10+ year in EE policy and program development and an emerging specialization in Green Bank financing) and Philippe Dunsky (providing his 20+ years of experience in EE/RE design, oversight and evaluation) providing expert advisory input as needed. We continue to deepen perspectives related to financing program evaluations, and modelling of financing impacts, by bringing learnings from our financing program work for groundbreaking programs in California, Connecticut, Iowa, and Toronto among others.

- (2) **EE FINANCING EXPERTISE: *Dunsky offers extensive experience designing and evaluating both PACE and Institutional Financing programs and strategies across the continent.*** The Dunsky team has been called on to design and evaluate a wide range of financing programs and strategies, including residential and commercial PACE programs, EE investment funds, and “green” banks. For example, we currently co-lead both impact *and* process evaluations for over 20 EE financing initiatives **across California**, including large-scale statewide pilots and the HERO PACE program. We are similarly working with the **Connecticut Green Bank's** full portfolio of financing strategies, and previously evaluated **Efficiency Maine's** PACE and PowerSaver financing programs. Our work evaluating an array of innovative financing programs for EE/RE has provided us with unique insights that will be valuable to ensuring the ultimate success of Rhode Island's efforts.

Dunsky has also designed multiple PACE programs (Ontario, Quebec), led consultations with lenders and property owners/developers/managers, advised utilities and governments on innovative financing including costing out business models, conducted numerous best practice / lessons learned reviews of PACE and similar financing programs across the continent, developed M&V frameworks for EE/RE lenders, and worked on related areas such as ICP protocols. In addition, David McNeil brings 20 years of hands-on experience in nearly all aspects of lending operations including credit adjudication, sales and marketing and creating strategic alliances with other financial institutions.

- (3) **EE/RE PROGRAM KNOWLEDGE: *Dunsky brings a strong reputation for EE/RE expertise, experience and insights.*** EE/RE is our core business. Over the years, we have designed and evaluated dozens of leading EE/RE programs spanning every market sector and segment. We bring a deep understanding of market barriers (and strategies to overcome them), and the experience and insights needed to judge which solutions are likely to succeed in growing uptake of EE/RE (beyond baseline), and which are at risk of failure.

Our experience with EE/RE is notably deep in New England, where we have worked in Massachusetts (incl. for both National Grid and Eversource), Rhode Island (EERMC), Connecticut (Green Bank), Maine (Efficiency Maine Trust) and Vermont (Department of Public Service). This has afforded us a depth of understanding of the broader landscape within which Rhode Island's efforts will play out.

(4) **TIMELINESS:** We have demonstrated throughout our work for the EERMC our commitment to respond in a timely manner to task orders, and we maintain this commitment going forward. In fact, our firm has a history of supporting clients where needs and activities are not entirely clear at the outset, but rather evolve over time. At the present time, we have three retainer-type contracts that require continuous adjustment to evolving needs, and would be glad to provide references that will attest to our clients' strong satisfaction with our nimbleness and responsiveness.

(5) **QUALITY:** As a mission-driven firm, quality is critical to our success. And for staff, quality is built into performance evaluations that are linked directly to compensation. For both those reasons, we pride ourselves on the quality of our work, and our clients systematically speak to that in their own evaluations. For example:

Rhode Island EERMC/OER *Superb communication and facilitation skills. Great ability to synthesize large amounts of material and provide clear, distilled recommendations. High quality work produced on a challenging and complex topic. Great project management skills.*

Efficiency NS *I emphatically recommend Dunsky's services to other colleagues due to their professionalism, attention to detail and excellent technical and regulatory insights.*

Acadia Center *Dunsky has a commanding knowledge of renewable energy, energy efficiency, regulatory structure and business success drivers.*

NEEP *Dunsky has provided us with critical research and insightful analysis for some of our most strategic projects. We're glad we can count on you to inform our next generation programs and policies.*

Cascades Paper Products Co. *You delivered above and beyond expectations, and demonstrated very strong market knowledge and expertise. I absolutely recommend Dunsky!*

State of Vermont *Excellent work. Easy to read, and charts illustrate the points. It sets up the right conversation about our policy choices going forward to achieve our goals. My compliments to the Dunsky group.*

FortisBC Energy *Your projects have always been of extremely high quality. You keep us on track, and provide relevant and timely analysis packaged for our needs.*

Efficiency One *I recommend Dunsky's services to my colleagues. They take care to listen, build client relationships based on trust and respect, and excel at communicating complex concepts. Their work is always solid.*

Hydro Quebec *For years you have contributed to our programs' successes, through strategic support, innovative programs, consistent rigor and exceptional responsiveness to our needs.*

We believe that the combination of our unique experience and expertise – in Rhode Island, across New England, throughout the United States and abroad – positions us to successfully support the EERMC. Indeed, our experience will help optimize the use of EE financing program investments in the state and help avoid common mistakes and pitfalls in finance program design. We hope you will agree.

Sincerely,



Philippe Dunsky

PROPOSED SCOPE OF WORK

Our proposed work plan is based on identified EE financing planning and assessment needs as communicated by members of the EERMC executive committee and the consultant team, along with our own assessment of the specific activities needed to support these tasks, as outlined below.

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

The creation of the Rhode Island Infrastructure Bank (RIIB) represents an important opportunity to drive energy efficiency and renewable energy adoption in the state, but with this opportunity comes significant challenges. At the same time the RIIB is establishing and implementing its new C-PACE and EBF programs, National Grid is looking for ways to leverage its OBF programs to access more savings. This has led to an expansion in the use of financing in RI from \$13M in 2014, to near \$40M projected for 2017, and further increases from there.

In order to ensure that this expansion of investment brings a corresponding impact, it is important to ensure that the EE financing programs are integrated into Rhode Island's EE planning cycles in an accurate, appropriate and balanced manner. This will require understanding the nature, impact and market for each financing program, and working with the key stakeholders to balance the resources available to support the programs in proportion to the savings they deliver. By ensuring the financing programs contribute and adhere to the Least Cost Procurement (LCP) policy, and assisting the programs to plan on a multi-year basis, we believe these efforts will help ensure that Rhode Island has in place a set of robust, sustainable and impactful financing programs.

To this end we envision carrying out the following activities:

- 1. Assist EERMC and consultant team to situate EE Financing in the 2018-2020 three-year plan:** This will begin by building on our recent memo that outlines the potential additional impact unlocked by Rhode Island's expanding use of EE financing, and the corresponding savings target contribution. We will continue to look at ways financing can help RI meet its savings targets, assess the programs' fit under the LCP requirement, and recommend ways to integrate financing within the overall 3-year EE plan strategy
- 2. Review EE financing components of 2018 EE Plan:** As per our efforts toward the 2017 plan, we will review the draft plan, make written comment on the amounts requested for each financing program, and providing data-supported recommendations for any recommended adjustments.
- 3. Perform a high-level assessment of new opportunities for EE Financing in multi-family buildings:** To date our assessment has been focused on areas covered by National Grid and RIIB programs. However, it has been indicated that there may be an interest and opportunity to develop a financing product specifically designed to meet the unique challenges posed by the multi-family building market. We proposed to conduct a high-level assessment of this opportunity, including a review of successful multi-family financing programs from other jurisdictions.

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

Much progress has been made on many of the recommendations from our February 2015 memo, while other recommendations are still being considered or implemented. In particular, we feel that RI's financing programs will benefit from improved and consistent access to performance data across all programs, which can test the assumptions behind the program design and help demonstrate which elements of the program designs are most impactful and which program features need modification. This will offer opportunities to ensure successful RIIB program design, integrate RIIB and NGRID programs, and allow the EERMC to determine to what degree these programs are meeting RI's EE objectives.

Moreover, while RIIB has established two key new programs, tracking these programs as they move past the initial round will be key to assessing their impacts and potential to support savings in the coming years. The essential components of successful commercial and residential lending business models are; low cost and stable source of funds, an efficient system of program administration/loan processing, customer-friendly enrollment systems and cost effective loan origination platform. We propose to follow these programs as they unfold in order to provide strategic feedback on the program designs and implementation, as well as capturing their role in the next rounds of EE program planning.

To this end we envision carrying out the following activities:

- 1. Make recommendations and input into consistent reporting standards for RIIB and National Grid EE financing programs:** In order to understand the impacts of each program, as well as the associated financial performance and risks, it has been proposed that there be a consistent annual results reporting template established among all EE financing programs. We will continue to engage with NGRID and RIIB staff to propose key reporting fields, reporting schedules, and a framework for comparative analysis of the supported and attributable savings among the various programs.
- 2. Track RIIB progress and programs:** Establishing a Green Bank was a key recommendation in our 2015 report, and since that time RIIB has successfully initiated two new financing programs (C-PACE and EBF) and is developing a third for launch in 2017. We believe that 2017 will be a critical year for RIIB as the C-PACE and EBF programs enter their second years, and seek to expand their lending volumes and impacts. Moreover, the ability of these programs to deliver new savings, in a coordinated manner with existing NGRID financing and incentive programs may be further demonstrated.

In order to capture these savings and approaches in the next round of EE program planning, we propose to track the program progress over the coming months, and perform a high-level assessment of the program processes and market reach based on interviews with Program staff and background research. These include:

- a. **Perform a 1-year review of C-PACE financing:** including reviewing the lists of projects, measures, supported savings and incentives applied. Gathering information from RIIB and NGRID staff on how C-PACE is being used to see savings projects in the C&I sector, and how well it integrates with NGRID OBF and incentives.
- b. **Track EBF Round 2 Progress:** We will communicate with RIIB staff to track the application volumes, projects, measures and savings supported, as well as the integration with NGRID programs. This will seek to assess the ability of Round 2 to achieve its loan volume targets, and to understand to what degree RIIB can leverage the ratepayer and RGGI injections with

private capital. These will be key understandings to inform any program design recommendations and future EE program planning.

- c. **Assist and Track R-PACE Development:** We propose to track RIIB's plan to launch a residential PACE program in 2017. We will offer our feedback on program design and best practices based on our insights from designing, researching and evaluating PACE programs in other jurisdictions.

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

National Grid has indicated that it intends to expand the OBF programs significantly over the coming years to help address barriers to EE project uptake that cannot be overcome through incentives alone. We agree that financing can play a key role in RI's C&I sector EE planning, but that the use and potential expansion of the OBF programs must consider opportunities to integrate the financing offer with other tools. This includes exploring ways that financing can help deliver energy savings in conjunction with incentives, not just to sell incentive programs, but to help encourage deeper savings, and/or keep the cost of new savings at a comparable level or lower than current program costs.

Second, the OBF program offers short-term financing that may conflict with the longer-term financing offered by C-PACE and EBF, and as a result discourage customers from taking on comprehensive, deeper savings projects. Thus we propose to look also at how OBF, C-PACE and EBF can be co-marketed and used in a coordinated manner to help maximize the savings and net-present value of EE projects, rather than simply delivering on customers' short-term payback goals.

Finally, while steps have been taken to expand the information available through the OBF Process evaluation and sharing program results data, further evaluation and study is needed to feed into improved integration among the various programs. This may also consider new evaluations and program modifications in the Small Business sector, which was largely overlooked in the past OBF program evaluation and modifications.

To this end we envision carrying out the following activities:

1. **Perform a final review of the OBF Evaluation Report and EnergyWise/HEAT Loan Evaluation Reports (Final Drafts – when available):** Building on our findings and feedback on the draft reports for these two studies delivered in 2016, we will update our recommendations and feedback into a pair of final memos that interpret the findings of each study in light of RI's overall financing trajectory and needs.
2. **Recommend and assist in the scoping of further evaluation efforts:** There remains a need for further financing program evaluation and assessments to capture the impacts and process implications in key sectors. These include assessing the impact of the extension of OBF LCI financing to 5-year terms, and the potential to extend loan tenors further and match them in the Small Business and public buildings OBF programs. There also remain many unknowns about how the HEAT loan program interacts with the Energy Star HVAC program and how it may overlap with the forthcoming R-PACE program.

- 3. Work with NGRID Staff to explore options to integrate OBF financing with incentive delivery to support flexibility in incentive levels:** For the OBF program to help maintain stable incentive costs per unit savings, it will need to be effectively integrated in the incentive program delivery approach. The draft OBF evaluation report indicated some opportunities that may be explored further, and we propose to engage with NGRID staff to consider options and propose program design and process recommendations that may work to this result.

Reporting and Communications

Beyond performing the tasks outlined above, we have included a plan to conduct regular communications with the relevant EERMC members, consultants and stakeholders. This includes:

- **Four in-person meetings:** As the work progresses we expect that needs will arise to present our work, findings and recommendations to the EERMC and/or its executive committee, as well as to meet other key stakeholders such as RIIB and National Grid.
- **Regular updates with the consultant team and/or EERMC executive:** Throughout 2016 our team maintained monthly progress calls with members of the Rhode Island consultant team to exchange information and plan tasks. We propose that these continue as a key input to guide our work.

Dunsky's Communications Commitment:

- Dunsky will convene calls where warranted or where requested by EERMC to discuss issues and concerns as they arise, and plan go-forward steps.
- Memos will be delivered in three steps: 1) a DRAFT to the EERMC 2) A call to present the memo findings and receive EERMC feedback, 3) edited FINAL draft will then incorporate EERMC feedback
- We will maintain regular contact with the key stakeholders throughout the effort: (National Grid, RIIB, EERMC, OER etc.) and will provide regular updates on the emerging programs

BUDGET AND TIMELINE

We propose a budget of \$90,000 (on a time and material basis) to complete the tasks outlined in this proposal letter, based on an assessment of the needs and level of effort from our understanding at the end of the current Consulting Service Retainer. A detailed budget and timeline of activities are presented below.

We expect the level of effort to be similar to our current consulting role, however, you will note that the proposed budget for 2016-17 is higher than for 2016 (\$70,000). This is attributable to two factors:

- 1) We are proposing a 12-month schedule for 2016-17, rather than the 10-month proposal for 2016
- 2) The 2016-17 budget includes an allocation for travel to meet stakeholders and report to the council.
- 3) While the rate schedule of some personnel have increased following inflation, we propose a balanced team that includes additional Consultant and Analyst support, **keeping the aggregate hourly rate for the work essentially equivalent to the 2015-16 retainer Contract** (see rate summary on next page).

Proposed Budget:

| | Hours | Analyst Support | Jerome Bilodeau | Martin Poirier | Alex Hill | Philippe Dunsky | Travel | Cost |
|---|------------|-----------------|-----------------|----------------|------------|-----------------|----------------|-----------------|
| | | \$ 160.00 | \$ 180.00 | \$ 210.00 | \$ 200.00 | \$ 240.00 | | |
| EEMRC: Meetings and Reporting | | | | | | | | |
| In-person meetings w/ EERMC/Executive/Stakeholders x4 | 60 | | 20 | | 40 | | \$4,000 | \$15,600 |
| Coordination with C-Team (monthly check-in calls) | 30 | | 12 | | 18 | | | \$5,760 |
| Task 1: Contribute Financing Program Expertise | | | | | | | | |
| 2018 EE Plan Input | 32 | 5 | 10 | | 12 | 5 | | \$6,200 |
| 2018-2020 three-year plan input | 53 | 10 | 15 | 15 | 10 | 3 | | \$10,170 |
| Opportunity Tracking (Mult-Family) | 22 | | 10 | | 10 | 2 | | \$4,280 |
| Task 2: Follow up on 2015 Report Recommendations | | | | | | | | |
| R-PACE Progress Tracking | 10 | | | | 10 | | | \$2,000 |
| Review of C-PACE YR1 | 40 | 10 | 20 | | 10 | | | \$7,200 |
| Review of EBF Round 2 | 40 | 10 | 20 | | 10 | | | \$7,200 |
| Develop Consistent Reporting Standards (RIIB-NGRID) | 30 | 10 | | 6 | 14 | | | \$5,660 |
| Task 3: Oversight of National Grid Programs | | | | | | | | |
| Review of OBF and EnergyWise Evaluation Final Reports | 20 | | | 5 | 15 | | | \$4,050 |
| Outline further evaluation efforts | 20 | | 5 | 10 | 5 | | | \$4,000 |
| Explore financing/incentive delivery integration | 93 | 18 | 20 | | 45 | 10 | | \$17,880 |
| Total | 450 | 63 | 132 | 36 | 199 | 20 | \$4,000 | \$90,000 |

Rate Summary Tables:

| 2016-17 | | | | | | | | | |
|---------------------|-----------------|-----------------|----------------|----------------|-----------------|---------|------------|------------------------|-----------------------|
| Rate (\$/hr) | \$ 160.00 | \$ 180.00 | \$ 210.00 | \$ 200.00 | \$ 240.00 | | | | 2016-17 |
| 2016-17 Total Hours | Analyst Support | Jerome Bilodeau | Martin Poirier | Alex Hill | Philippe Dunsky | Travel | Total Cost | Total not incl. travel | Aggregate hourly rate |
| 450 | 63 | 132 | 36 | 199 | 20 | \$4,000 | \$90,000 | \$86,000 | \$191.11 |
| 2015-16 | | | | | | | | | |
| Rate (\$/hr) | \$155 | \$210 | \$200 | \$190 | \$230 | | | | 2015-16 |
| 2015-16 Total Hours | Marina Malkova | David McNeil | Martin Poirier | Alex Hill (PM) | Philippe Dunsky | Travel | Total Cost | Total not incl. travel | Aggregate hourly rate |
| 368 | 85 | 100 | 23 | 140 | 20 | n/a | \$69,975 | \$69,975 | \$190.15 |

Proposed Work Plan 2016-2017:

| Period | 2016 | | | | 2017 | | | | | | | | | | | | | | | | | | | | | |
|---|----------|---|----------|---|---------|---|----------|---|-------|---|-------|---|-----|---|------|---|------|---|--------|---|-----------|---|---------|---|---|--|
| | November | | December | | January | | February | | March | | April | | May | | June | | July | | August | | September | | October | | | |
| | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | | |
| EEMRC: Meetings and Reporting | | | | | | | | | | | | | | | | | | | | | | | | | | |
| In-person meetings w/ EERMC/Executive/Stakeholders x4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coordination with C-Team (monthly check-in calls) | R | | R | | R | | R | | R | | R | | R | | R | | R | | R | | R | | R | | R | |
| Task 1: Contribute Financing Program Expertise | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2018 EE Plan Input | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2018-2020 three-year plan input | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opportunity Tracking (Mulit-Family) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Follow up on 2015 Report Recommendations | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-PACE Progress Tracking | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Review of C-PACE YR1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Review of EBF Round 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop Consistent Reporting Standards (RIIB-NGRID) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Oversight of National Grid Programs | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Review of OBF and EnergyWise Evaluation Final Reports | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Outline further evaluation efforts | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Explore financing/incentive delivery integration | | | | | | | | | | | | | | | | | | | | | | | | | | |

PROJECT TEAM BIOGRAPHIES

We include a brief bio outlining the role and core skills of each of our proposed team members, and a detailed CV for each is appended. We provide a five-person team with range of skills and recourse to ensure that our team can respond to all of the EERMC's needs in a timely and efficient manner.

PHILIPPE DUNSKY: PROJECT DIRECTOR

Mr. Dunsky has a long track record working on developing innovative financing approaches for energy efficiency and demand-side renewable energy. Mr. Dunsky was formerly Vice President of a sustainable development venture capital fund; was the longest-standing governor of a \$650M revolving loan fund; was a founding member of the Ethical Investors Group, a private investment group; and is currently involved in the design and evaluation of six innovative DSM financing mechanisms in as many regions. His experience in financing covers the residential, commercial and institutional sectors, including property-assessed (PACE), utility on-bill (PAYS and non-PAYS models), and direct models. He has extensive experience in providing both strategic and analytical support for clients ranging from electric and gas utilities to government agencies, private power producers, non-profit organizations and energy efficiency firms.

Mr. Dunsky couples strong analytical skills and creativity with a fundamental understanding of energy markets, financial instruments and environmental concerns. He brings to his work a passion for bridging the gap between economic growth and environmental sustainability. Mr. Dunsky holds a post-graduate diploma in Economics from the University of London (UK).

ALEX J HILL: PROJECT LEAD

Alex Hill is a highly experienced project manager in the fields of applied renewable energy and energy efficiency financing program and strategy design. . **Alex has spearheaded a range of innovative financing program design and strategic initiatives for clients including:** leading Dunsky's role in evaluating over 20 EE financing programs in California (process and impact), performing an assessment of financing programs and opportunities for the State of Rhode Island; analyzing opportunities for Commercial Building Energy Efficiency Financing (for TAF); developing a residential PACE program for Ontario municipalities; assessing the business case for solar PV financing for a private utility in the mid-west US; developing a business model for the City of Saskatoon's municipal financing of solar energy; and most recently developing a GHG reduction financing fund model for the

City of Calgary. Alex has led a range of other policy initiatives including a review of Building Energy Reporting and Labelling Policies (for the Northeast Energy Efficiency Partnerships), a 20-year projection of Renewable and Clean Energy Technologies Development (for CEATI).

MARTIN POIRIER: PROGRAM EVALUATION EXPERT

Martin has nearly 20 years of experience in energy efficiency and renewable energy. Throughout his career, he has led or been deeply involved in the evaluation, design, and analysis of countless energy efficiency programs and plans. Martin led Dunsky's involvement in conducting an impact and process evaluation of the PACE Maine program, and provides expert input to all of Dunsky's program evaluation efforts. Mr. Poirier is particularly adept at complex analytical tasks, including both energy and economic modelling, in addition to strategic work. He holds a B.A. in accounting and an M.A. in sociology, and is a Certified Measurement and Verification Professional (CMVP).

JEROME BILODEAU: RESEARCH CONSULTANT AND GREEN BANK FINANCE EXPERT

Jerome has eight years of experience in the design, analysis and evaluation of environmental and energy policies and programs. Jerome has been involved in the development of energy policies and strategies at the federal and provincial levels in Canada, in the support of financing programs and Green Bank-like organizations in jurisdictions such as Rhode Island, Ontario, and California, and in clean energy funding strategies for private organizations. He currently sits on the board of the Canadian Coalition for Green Finance, and on the Finance Subcommittee of the Alliance to Save Energy. Prior to joining the Dunsky team, he was involved in the development and adoption of national energy efficiency standards, test procedures, and building codes for HVAC equipment in Canada; in the modelling, design, and evaluation of federal climate regulations in the coal-fired electricity sector; and in the management of R&D projects pertaining to power generation. Jerome holds a bachelor's degree in mechanical engineering and a master's degree in business administration.

DUNSKY'S RELEVANT PROJECT EXPERIENCE

We have assembled a list, out of the hundreds of our completed projects that demonstrates our extensive background in the financing space and our track record finding solutions to EE/RE needs for states, utilities and municipalities.

Rhode Island Financing Retainer (2015-16)

- **Tracked progress toward Dunsky's 2015 recommendations for EE financing in RI, including following and providing feedback to RIIB and NGRID programs**
- **Assessed the potential of financing to contribute to state EE savings targets over the 2018-2020 period**
- **Provided recommendations and feedback on financing program evaluation research and reports**

Dunsky Energy Consulting was engaged by the EERMC to provide strategic consulting related to the use of financing to support energy efficiency in the sated. Our work sought to explore and understand the impacts, benefits and potential pitfalls related to an expanded use of financing with in the state, and to determine to what degree it supports progress toward state goals and policies, such as the Least Cost Procurement regulation.

Financing Evaluation Framework Development: Connecticut Green Bank (2015-16)

- **Assessed the Green Bank's evaluation and reporting needs, recommending Key Performance Indicators to meet government and public communication goals**
- **Developed a general financing program evaluation framework to assess the impact and market transformation effects attributable to Green bank financing products**
- **Applied the framework to the C-PACE (commercial) and Smart E (residential) programs**

Dunsky is assisting the Connecticut Green bank to develop an evaluation framework that will help it communicate the impacts and benefits that its commercial, residential and public sector financing products are delivering. The goal is to provide information through evaluations that will help the Green Bank continuously improve its programming, and to support its efforts to communicate with key stakeholders.

California PUC: Impact Evaluation of Rate-payer supported EE/RE Financing Programs (2013-2016)

- **Developed Attribution of savings methodology for financing programs when combined with rebates**
- **Cost effectiveness testing of financing programs**
- **Evaluation of all new California Pilots, PACE and OBF programs**

Dunsky and Opinion Dynamic are working together to evaluate the CPUC supported financing programs across California. We have developed interview guides and survey tools, and performed a financing market characterization at the state and county levels. We are also developing a tailored tool to assist the CPUC in performing cost-effectiveness evaluations of each program, and their economic and energy saving impacts.

Investor Confidence Project Canada – EE Financing Standards: MaRS Development District (2015)

- **Facilitated stakeholder consultation process with the financial, building and Energy Industries**
- **Developed recommendations for adapting the Investor Confidence Project’s EE financing standards**
- **Prepared work plan and strategy for establishing ICP Canada and de-risking EE financing investments**

Dunsky assisted the MaRS Development District of Toronto Ontario to establish a strategy for adapting the Investor Confidence Project (ICP) to the Canadian commercial buildings market. ICP is a tool for standardizing EE financing investment development, underwriting and QA/QC protocols to de-risk the investments and encourage greater access to EE financing. We reviewed the technical and financial criteria contained within the ICP protocols to identify where they can be easily applied to the Canadian market, and where alterations would be needed.

Rhode Island Financing White Paper (2014)

- **Assessment of EE/RE financing in Rhode Island’s commercial, residential and public sector markets**
- **Consultation with stakeholders in view of creating an EE financing strategy for the state**
- **Recommendations to improve effectiveness and reach of Rhode Island’s EE/RE financing programs.**

Dunsky Energy Consulting was engaged by the EERMC to study the current use of energy efficiency (EE) financing in Rhode Island, and to provide a high-level indication of where altering or expanding existing programs, or the addition of new programs, would increase the impact of the EE financing. The study involved two core activities: research into Rhode Island’s financing programs through a review of published documentation and interviews with key stakeholders (program administrators, lenders and participants), as well as a series of four workshop discussions with the OER Financing Committee to guide the study and provide feedback on the findings.

PACE Maine Evaluation: Efficiency Maine (2012-2013)

- **Process evaluation of PACE-Maine program**
- **Review of best practices and processes**
- **Performed cost effectiveness analysis on PACE programs with multiple funding sources**

Opinion Dynamics and Dunsky Energy Consulting combined their experience in new and emerging program evaluation and innovative financing programs to lead the process and impact evaluation and the cost-effectiveness analysis of Efficiency Maine’s PACE and PowerSaver Loan Programs and the associated Residential Direct Install (RDI) Program.

Commercial Building Sector Financing Opportunities White Paper: Toronto Atmospheric Fund (2013-2014)

- **Prepared white paper based on stakeholder discussions and strategic opportunities analysis**
- **Designed models for new strategic commercial sector financing pilots**

The Toronto Atmospheric Fund engaged Dunsky Energy Consulting to provide assistance in identifying the areas of high potential for the financing of EE retrofits in Canada’s commercial building sector. The process focused around structured and targeted consultations with key industry players, including: building owners and managers, power and gas utilities, banks, specialized investors, equipment suppliers, energy services companies, not for profit organizations such as industry associations, and other thought-leaders in this space.

PACE Energy Efficiency Program Design: Clean Air Partnerships/Toronto Atmospheric Fund (2013)

- **Led working group, presentations on other jurisdiction financing program lessons learned**
- **Full residential and multifamily sector program design and analysis**
- **Review of provincial fiscal powers and linkages between financing and other EE programs**

The Dunsky team was retained to design a pilot PACE/LIC-type program for a variety of municipalities in Ontario covering commercial (MURB) and residential properties. We assessed lessons learned from financing programs across North America, consulted municipalities and contractors, and prepared a detailed pilot program design.

Calgary Emissions Reduction Fund Development and Strategic Analysis – City of Calgary (2014 ongoing)

- **Opportunities analysis, determined the financing envelope needed to meet overall EE and GHG goals**
- **Legislative tools and powers assessment and recommendations to support EE financing**

Dunsky developed a model for a municipal GHG reduction fund that will provide financing to private and public facilities and residential properties to undertake energy retrofits. Our work included a gathering of experiences from other similar funds, and a review of the City's borrowing and lending powers, and other relevant programming and legislation.

Quebec Association of Energy Management: PACE Program design, business case and guide (2012-13)

- **Full residential and multifamily program design and analysis**
- **Review of provincial fiscal powers and linkages between financing and other EE programs**

The Dunsky team finalized the design of a PACE/LIC-type program for municipalities across Quebec, rooted in best practices and the unique characteristics and contexts of the Quebec market.

Distributed solar PV financing opportunities analysis and study: City of Saskatoon (2013-14)

Dunsky assisted the City of Saskatoon to assess financing models that can help local property owners support the installation of rooftop solar PV systems. For this project, we analyzed a variety of city-driven financing models, including property-assessed financing, solar leases, utility on-bill repayment, as well as enhancements to standard consumer financing.

B.C. Ministry of Energy and Mines: Financial modeling to inform program design (2012)

Dunsky assisted the Government of British Columbia in its design of a province-wide Pays-As-You-Save (PAYS) model. This included a review of financial analysis methodologies, a thorough analysis of retrofit upgrade savings opportunities, a cost assessment of retrofit measures, comprehensive simulations and scenarios, and the creation of a user-friendly, Excel-based tool for further analysis by the Ministry.

APPENDIX: SENIOR TEAM MEMBER CVS



PHILIPPE DUNSKY

PRESIDENT

SUMMARY

Philippe Dunsky brings over twenty years of experience advising clients throughout North America in the fields of energy efficiency and renewable energy. He has extensive experience in the design, evaluation and support of effective EE/RE plans, policies, programs and opportunities, for clients ranging from electric and gas utilities to government agencies, private firms, and non-profit organizations. Philippe's value lies at the intersection of five key qualities: strong analytical skills and creativity; a deep appreciation of clients' strategic needs and objectives; effective written and oral communications; a fundamental understanding of market and consumer dynamics; and a lifelong passion for bridging the gap between economic growth and environmental sustainability. In addition to his consulting work, Philippe has been appointed to an array of directorships, including venture capital firms, revolving loan funds, start-ups, and non-profits. He is currently a member of the board of the Canadian Energy Efficiency Alliance.

Philippe's work has focused largely on the following areas:

- **Comprehensive Plans:** DSM portfolio reviews and preparation of full-scale EE/RE plans, including all related issues such as policies, guiding principles, portfolio design, design of individual programs and strategies, savings and cost-effectiveness analysis, benchmarking, and others. Also provided full regulatory support, including responding to interrogatories, assisting with hearings preparation, providing expert testimony, and other strategic support.
 - *Sample clients: Efficiency Maine Trust, N.J. Board of Public Utilities, Quebec Energy Efficiency Agency, NB Power, Manitoba Hydro, Efficiency Nova Scotia Corporation*
- **Program Design:** Designed dozens of EE/RE programs, including: low-income retrofit (including owner and renter markets), home energy retrofit (including single- and multi-fuel), residential new construction, residential heating systems (including advanced/renewable heat), appliance turn-ins, efficient plug loads, fuel switching, small commercial retrofit, large commercial custom (comprehensive), small and large industrial, and customer-sited renewable power generation programs.
 - *Sample clients: BC Hydro, Terasen Gas, NYSERDA, Government of Saskatchewan, City of Toronto, Hydro-Quebec, Quebec Bureau of Energy Efficiency & Innovation, Nova Scotia Power Inc.*

- **Best Practice Reviews:** Conduct numerous reviews of best practice and lessons learned from experience with a diverse set of EE/RE program and strategic areas, including: residential retrofit, new construction, energy technology innovation, low-income programs, innovative financing mechanisms, high-efficiency products and appliances, home and building energy performance labelling requirements, small business direct install programs, large commercial custom (including negotiated approaches), behavioural (including home energy reports), small-scale renewable power, and others.
 - *Sample clients: Hydro-Quebec, Efficiency Maine Trust, Efficiency New Brunswick, Terasen Gas, Long Island Power Authority, Saskatchewan Go Green Fund.*
- **Cost-Effectiveness and Market Potential:** Conducted detailed cost-effectiveness analysis for thousands of measures/building types, dozens of programs and several comprehensive plans, using the full slate of standard cost-effectiveness test procedures. Developed economic and achievable potential studies at various levels of granularity, for both energy efficiency and demand response. Advised clients and presented to international audiences on appropriate cost-effectiveness testing methodologies, protocols, policies and algorithms.
 - *Sample clients: California Public Utilities Commission, NB Power, Newfoundland and Labrador Hydro, Quebec Energy Efficiency Agency, Efficiency Maine Trust, New Jersey Board of Public Utilities, Hydro-Quebec, BC Hydro, Efficiency Nova Scotia.*
- **Next-Generation Strategies and Opportunities:** Assessed opportunities and developed innovative strategies for “next-generation” opportunities, including: home energy labeling, building energy performance benchmarking, innovative financing models, advanced (“smart”) thermostats, demand response opportunities, community engagement strategies, small-scale renewable power, and advanced green heating systems. Also managed opportunity and technology assessments for advanced technologies including solar (PV and CSP), deep-well geothermal, hydrokinetic, whole-house pellet systems, advanced biomass/biogas, and others.
 - *Sample clients: Northeast Utilities, National Grid, Northeast Energy Efficiency Partnerships (NEEP), Canada Mortgage and Housing Corp., B.C. Ministry of Energy and Mines, Efficiency Nova Scotia, Quebec Energy Efficiency Agency, Center for Energy Advancement through Technological Innovation (CEATI)*
- **Program Evaluation:** Led and supported program evaluations, including: process and impact evaluations; assessment and design of evaluation plans; counsel on evaluation planning, strategies, and approaches; methodological issues including attribution (conventional and non-conventional programs), net-to-gross (including spillover and market effects), logic models and evaluation surveys; development of evaluation protocols and savings algorithms; assessment of program-related non-energy benefits; and others.
 - *Sample clients: California Public Utilities Commission, Canadian Office of Energy Efficiency, Northeast Energy Efficiency Partnerships, Hydro-Quebec, Quebec Energy Efficiency Agency, Efficiency Nova Scotia Corporation, Efficiency Maine Trust, Equiterre.*
- **Others:** Many other advisory services including EE/RE policy, administrative models, technical support, incentive regulation, staff training, benchmarking, greenhouse gas / carbon strategies, non-energy benefits, employment impacts, and a host of others.
 - *Sample clients: Ontario Power Authority, Manitoba Hydro, Efficiency Vermont, Efficiency NB, Association of Energy Service Professionals, Rio Tinto Alcan, Canada Economic Development.*
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PROFESSIONAL EXPERIENCE

- 2004 --** ***Dunsky Energy Consulting***
 Founder/President of leading energy efficiency and renewable energy consulting firm. Research, analysis and strategic counsel for a broad clientele comprised of utilities, government agencies, private firms and non-profit organizations.
- 2004-2005** ***McGill University***
 Lecturer in the Faculty of Management.
- 1996-2004** ***Helios Centre for Sustainable Energy Strategies***
 Executive Director of an independent, sustainable energy think tank focused on the intersection between climate, energy solutions and market issues. Diverse clientele including governments, consumer and environmental groups, utilities, large industry, independent power producers and First Nations.
- 1995-1996** **INDEPENDENT ENERGY CONSULTANT**
 Consulting for various governmental and non-governmental bodies. Projects included design of large residential energy efficiency retrofit program and assessment of a variety of demand and supply-side options. Also named to several blue-ribbon panels.
- 1991-1994** **ENJEU INC.**
 Energy Director for environmental non-profit. Played a key role in conducting research as well as representation in utility consultative and collaborative processes.

EDUCATION & TRAINING

- Trainer** (U.S. and Canada) Association of Energy Service Professionals, 2013--
- Lecturer** Faculty of Management, McGill University, 2004-05
- Post-Graduate Diploma** Economics, University of London (U.K.), 2002
- Guest Lecturer** Many university courses addressing business strategies, management, energy, and the environment, including at McGill University, University of Montreal-HEC, University of Laval, and Concordia University.

PUBLICATIONS (PARTIAL LIST)

- 2013 "Coast-to-Coast: An Update on On-Bill Financing Program Strategies". Johnson, Degens, Dixon, Flanders, and Dunsky, in *International Energy Program Evaluation Conference Proceedings*.
- 2012 "Establishing Savings Algorithms and Evaluation Procedures for Emerging Technologies and Innovative Program Approaches". McCowan, Dunsky, Livingston, and Sutter, in *American Council for an Energy Efficient Economy 2012 Summer Study Proceedings*.
- 2012 "DSM Cost-Effectiveness: When the TRC Harms Efficiency, What's Next?", *American Council for an Energy Efficient Economy*. Dunsky and Boulanger, in *American Council for an Energy Efficient Economy 2012 Summer Study Proceedings*.
- 2010 "Nobody's Perfect: Choosing (and Improving) Models for Energy Efficiency Program Administration". Dunsky and Lindberg, in *American Council for an Energy Efficient Economy 2010 Summer Study Proceedings*.
- 2010 "Small Goes BIG: Large-Scale Savings from Small Commercial Customers", Dunsky and Gobeil, in *American Council for an Energy Efficient Economy 2010 Summer Study Proceedings*.
- 2010 "Transforming Markets with Mandatory Building Energy Labeling". Dunsky, Lindberg and Fasey, in *American Council for an Energy Efficient Economy 2010 Summer Study Proceedings*.
- 2010 "Mandatory Energy Disclosure for Existing Homes and Buildings: A New Policy Opportunity". Dunsky and Lindberg, in *Association of Energy Service Professionals (AESP)*.
- 2008 "The Current Electrical Revolution: Portrait of a Newly Emerging Architecture in Industrialized Countries", *SAPIENS*, Vol. 1, Issue 2, 2008. Sole author.
- 2006 "Transforming the Market for Efficient Power Supplies: Opportunities Assessment and Early Experience in Canada", ACEEE 2006 Summer Study – Proceedings, August 2006. Lead author, with I. Saint-Laurent, K. Dunn and V. Fulbright.
- 2006 "Québec's Economic Energy Efficiency Potential: Results of a Utility-Stakeholders Working Group Process", ACEEE 2006 Summer Study – Proceedings, August 2006. With B. Gobeil and M. Parent.
- 2004 "The Electricity Revolution Underway: Portrait of an Emerging New Architecture in Industrialized Nations", *Vertigo*, Spring 2004. Sole author. [French]
- 2003 "Gas Turbines and Renewable Energy: Comparing Apples with Apples", *Cahiers de l'énergie (Energy Perspectives)*, October 2003. Contributor, with M. Bolinger, R. Wisser and W. Golove. [French]
- 2003 "Canadian Industry and the Kyoto Protocol", *Cahiers de l'énergie (Energy Perspectives)*, April 2003. Lead author, with Patrick Henn. [English and French]
- 2002 "What Energy Future? – Understanding the current transition to better plan for the future", *Cahiers l'énergie*, December 2002. Sole author. [French]

- 2001 "Lessons from California's Energy Crisis", CHOC (magazine of the Quebec Electricity Industries Association), June 2001. Sole author. [French]
- 2001 "California's Power Crisis: The Demand Side of the Equation", in Inside Energy (U.K.), April 2001. Sole author. [English]
- 2001 "Lessons from the California Power Crisis", simultaneously in PowerOnline and ElectricNet, Feb. 20, 2001. Sole author. [English]
- 2000 "1920-1995 and Beyond: Trending Downwards", in Cogeneration and On-Site Power Production, James and James Science Publishers, no 6, Nov.-Dec. 2000, 29-34. Sole author. [English]
- 1999 "Keeping the Promise: Making Renewable Portfolio Standards Work", in WindPower '99, Proceedings of the American Wind Energy Association 25th Annual Conference, Paper #27, Chapter 6A: Economics. Sole author. [English]
- 1998 "Residential DSM Programme Development and Implementation – Lessons from PRIME", in Energy Efficiency in a Competitive Environment, Proceedings of the American Council for an Energy Efficient Economy (ACEEE) 1998 Summer Study on Energy Efficiency in Buildings, Panel on International Collaborations and Global Market Issues, Volume 5, pp. 5.61-5.72. Sole author. [English]
- 1998 "Challenges for Effective Competition in Large Hydro-Dominated Markets – The Case of Québec", in Deregulation of Electric Utilities, Chapter 5 (pp. 101-117). Norwell, Mass and Dordrecht, Netherlands: Kluwer Academic Publishers, 1998. Topics in Regulatory Economics and Policy, vol. 28. Lead author, with P. Raphals. [English]
- 1998 "Toward Improved Reliability – Lessons from the Ice Storm", in L'Énergie au Québec – Quels sont nos choix?, Chapter 5 (pp. 85-98). Montreal, Qc: Les éditions écosociété, 1998. Lead author, with P. Raphals. [French]
- 1997 "New Renewable Energy Technologies", in Le mercure solaire, published as series in successive editions over three years. Sole author. [French]
- 1996 "Perspectives for Wind Power in Quebec: Past and Future Trends and Cost Forecasts", in Energy Studies Review, Volume 7, No. 3, pp. 276-291. Sole author. [French]
- 1996 "Toward a Demand-Side Future", in Profiting from Energy Efficiency, Proceedings of the American Council for an Energy Efficient Economy (ACEEE) 1996 Summer Study on Energy Efficiency in Buildings, Panel on Energy and Environmental Policy, Volume 9, pp. 9.39-9.48. Sole author. [English]
- 1996 "Against the Tide", in Canadian Energy Markets, October-November 1996, online version. Sole author. [English]
- 1995 "Playing With Fire", in Hydro-Québec – Autres temps, autres défis, University of Quebec at Montreal's annual Series on Leaders of Contemporary Québec, pp. 267-279. Montreal: Presses de l'Université du Québec, 1995. Sole author. [French]
- 1994 "Sustainable Energy Development in Quebec – Opportunities and Outlook", in Le développement durable, Proceedings of Hydro-Québec conference, 15 p. (unnumbered). Sole author. [French]
- 1994 "Playing with Fire: Hydro-Québec Faces Serious Risk by Following its Current Path. It Could Still Change Course", in Perspectives, vol. 6, no. 2, February-March, pp. 9-11. Sole author. [English]

- 1994 "E4=Energy, Economy, Environment, Ethics", in L'ENJEU, vol. 13, no. 3, p.45. Sole author. [French]
- 2013 **AESP: New Adventures in EM&V (online)**: "Standard' Cost-Effectiveness Tests? Not Quite".
- 2013 **Bright Business Conference (Halifax)**: "Revisiting Cost-Effectiveness Screening".
- 2013 **ACEEE Finance Forum (Chicago)**: "International Experience with Innovative Financing Mechanisms for Energy Efficiency and Demand-Side Renewables".
- 2013 **Association des économistes du Québec (Québec)**: "Efficacité énergétique : la ressource énergétique à bas prix ».
- 2012 **Efficiency First (online)**: "Inside the Black Box", national (U.S.) webinar.
- 2012 **Association of Energy Service Professionals (online)**: "Screening Energy Efficiency: Best Practices" webinar panel.
- 2012 **American Council for an Energy Efficiency Economy (Pacific Grove, CA)**: "When the TRC Harms Efficiency, What's Next?".
- 2012 **AESP Summer Conference (Toronto)**: "Will New Codes & Standards Kill Efficiency?"
- 2011 **Americana – 9th Biennial International Environmental Technology Conference (Montreal)**: "An Energy Rating for Every Building – Mandatory Labelling for Commercial Buildings".
- 2010 **4th National Geoexchange Technical and Policy Forum (Montreal)**: "Unleashing Demand through Innovative Financing Strategies".
- 2010 **American Council for an Energy Efficiency Economy (Pacific Grove, CA)**: several speaking engagements.
- 2010 **Association of Energy Service Professionals 20th Conference (Tucson)**: "Mandatory Energy Disclosure for Existing Homes and Buildings: A New Policy Opportunity"
- 2009 **Affordable Energy Conservation Forum (Vancouver)**: "Lessons for (Private) Low-Income Home Energy Efficiency Programs"
- 2009 **AQME (Montreal)**: "Leadership nord-américaine en efficacité énergétique"
- 2008 **Time for Action (Toronto)**: "Energy Efficiency for Private Low-Income Homes"
- 2008 **Consultation publique sur l'efficacité énergétique (luncheon keynote)**: *Le défi du leadership*
- 2007 **Canadian Association of Members of Public Utilities Tribunals (CAMPUT)**: *Utilities and the Environment: What More Should Be Done?*
- 2007 **McGill University Conference on Business Sustainability (Montreal)**: *The Challenge of Energy*
- 2006 **Unisfera Conference on Business and Sustainability**: *Negawatts: From Fantasy to Reality*
- 2006 **American Council for an Energy Efficient Economy (Pacific Grove, CA)**: "Transforming the Market for Efficient Power Supplies: Opportunities Assessment and Early Experience in Canada"
- 2006 **AQME (Drummondville)**: "*Pour bientôt: les ordinateurs efficaces*", et "*Politique énergétique : quel rôle pour l'efficacité ?*"
- 2006 **Association des économistes du Québec (keynote luncheon speaker)**: "*Le défi énergétique : Faire plus avec (beaucoup) moins*"
- 2003 **CLD Manicouagan (guest luncheon speaker)**: "*L'énergie au 21e siècle*"
- 2003 **Canadian Association of Members of Public Utilities Tribunals (Banff, AB)**: "*Kyoto: Implications for Utility Regulation*"
- 2001 **Circle of International Affairs**: "*The Future of Energy in North America*"
- 2000 **Canadian Gas Association (Montreal)**: "*Convergence of Technology, Market and Societal Forces: Implications for the Gas Industry*"
- 2000 **Canadian Institute of Energy (Vancouver)**: "*Distributed Generation: Needs and Opportunities, Promise and Concern*"
- 1999 **Canadian Electricity Association (Calgary)**: "*Standing at the Crossroads: Early Thoughts on a Regulatory Agenda for Distributed Energy Technologies*"
- 1999 **American Wind Energy Association (Burlington)**: "*Exploring the Limitations of the Renewables Portfolio Standard*"
- 1999 **Canadian Association of Members of Public Utilities Tribunals (CAMPUT)**: "*Sustainability and Competitive Energy Markets*"



Alex J. Hill
MEng, PMP, LEED AP
SNR CONSULTANT AND PRINCIPAL

- An experienced and highly competent project manager (Certified Project Management Professional)
- Over 15 years' experience leading energy efficiency initiatives and groundbreaking green building projects
- A superior understanding of energy efficiency, innovative financing, program evaluation, renewable energy
- Experienced in building commissioning and energy opportunities analysis for the commercial building sector
- Highly proficient researcher, delivering clear and concise reports to meet client information needs
- Highly developed communication skills, key to establishing and maintaining relationships with partners

PROFESSIONAL EXPERIENCE

2012- DUNSKY ENERGY CONSULTING Senior Energy Consultant

- Developing Evaluation framework for Connecticut Green Bank and C-PACE program
- Leading the strategic development of a municipal energy efficiency financing fund
- Supporting the evaluation of some twenty EE/RE financing pilots and programs in California
- Led a multi-sector strategic consultation process to develop a national commercial sector energy efficiency financing pilot program model
- Led the design of commercial and residential innovative financing for energy efficiency retrofit program for the Clean Air Partnerships (Ontario) and the City of Saskatoon.
- Performed measures characterization and savings specifications for the OPA and to support other residential and commercial incentive programs.
- Co-led Assessment of Emerging Renewable Energy Technologies for CEATI International (in partnership with leading experts in the solar, wind, biomass and hydrokinetic energy fields)
- Authored Building Energy Performance Benchmarking and Disclosure Best Practices Report for Northeast Energy Efficiency Partnerships (NEEP)
- Evaluation of PACE Home Energy Efficiency Loans program - Efficiency Maine

2009-2012 SUSTAINABILITY CONSULTING

- **Energy Efficiency Financing Program Development:** *Frontier Finance International, Washington, DC*
 - Evaluated and recommended opportunities for developing energy efficiency loans program for the tourism sector for Sekerbank, Turkey
 - Developed and led sustainability strategy for ProCredit Bank, Albania
 - Elaborated energy efficiency loans program and performed executive training for ProCredit Bank, Ukraine
- Environmental policy and management strategy for an international development foundation and its partners, *Le Fondation Léger*

- Urban Greening Program Evaluator: *Institute Nationale de Santé Publique de Québec, Plan d'action sur les changements climactiques*
- Sustainability planning and management including energy efficiency auditing: *Yellow Pages Group Canada, Hotel Sacacomie, Spa Eastman, Le Massif - Hotel La Ferme*
- Senior Engineering Consultant for BioRegional North America: One Planet Living
 - *Groupe Pacific Meadowbrook, 1500 unit development*
 - *Clark Realestate, Poplar Point, Washington D.C. \$5B urban renewal*
 - *PN Hoffman, Washington D.C. South West Waterfront revitalisation*

2005 - 2010 GREEN ENERGY BENNY FARM

General Manager

- *Managed all aspects of Énergie Verte Benny Farm a community owned energy services company implementing a \$3.1M FCM-funded pilot project*
- *Coordinated the development of the first integrated geo-exchange/solar energy system of its size in Canada (servicing 140 residential social-housing units)*
- *Created and implemented a program to help home owners establish solar energy equipment buyer's groups*
- *Established the business, energy performance contracts, and prepared business plan on the potential for geo-exchange and solar energy in Montreal*

2007 – 2009 ECOCITÉ DEVELOPMENTS, MONTREAL, QUEBEC

Project Manager

- *Managed construction of Abondance Montreal, Canada's first net-zero energy condominium project - the cutting edge of market ready eco-energetic construction*
- *Responsible for planning all financial and technical aspects of the condominium development*

2000 – 2005 ALTERNATIVES INC, MONTREAL, QUEBEC

Environmental Program Manager

- *Established and managed a mid-sized international development organisation's environment program*
- *Selected partners and managed international environmental initiatives:*
 - *Resource-Conflict Peace Building Programs (Indonesia)*
 - *Cross Boundary Water Resources Management (Pakistan)*
 - *Community Economic Rehabilitation (Cuba)*
- *Founded the Rooftop Garden Project, a multi-sectoral an international action-research project that seeks to integrate food production into the urban context*
- *Initiated a 100-bus Biodiesel demonstration project with the City of Montreal and developed a 1st level environmental lifecycle analysis of the fuel*

EDUCATION

| | | |
|----------------|---|-------------------|
| GRADUATED 2000 | Master of Civil (Environmental) Engineering (Thesis topic: surfactant aided ground-water remediation) | McGill University |
| GRADUATED 1996 | Bachelor of Chemical Engineering (Minor in Environmental Engineering) | McGill University |



MARTIN POIRIER

SENIOR CONSULTANT

Martin Poirier, senior consultant at Dunsky Energy Consulting, has nearly 20 years of experience in the energy sector, most notably in the design, analysis and review of energy efficiency programs and plans, and the assessment of countless opportunities at the measure, program, plan and potential study levels. His latest projects include a potential study for the Cape Cod area for Cape Light Compact (ongoing), analyses on DSM and renewables potentials in Manitoba, and an assessment of energy efficiency measures promoted through retailers for the Ontario Power Authority.

Mr. Poirier's experience spans the full breadth of sectors, including residential, commercial and industrial, and multiple fuel sources, including electricity, natural gas and renewables, as well as related issues such as cost-benefit analyses, utility regulation and program evaluation. Mr. Poirier is a Certified Measurement and Verification Professional (CMVP).

Professional experience

2008 -- DUNSKY ENERGY CONSULTING

Senior Consultant

Experience – Opportunities Assessment and Potential Studies

- Is currently developing a potential study model for the Cape Cod and Martha's Vineyard areas (*for Cape Light Compact*)
- Assessed the potential development of renewable energies in Québec remote regions (*for Hydro-Québec*)
- Evaluated the achievable potential for electric energy efficiency in all market segments (*for Hydro-Québec*)
- Provided an analytical model to support the design of the forthcoming Pay-As-You-Save (PAYS) on-bill financing program, including a review of financial analysis methodologies, a thorough analysis of retrofit upgrade savings opportunities using HOT2000 modeling, a cost assessment of retrofit measures, comprehensive simulations and scenarios, and the creation of a user-friendly, Excel-based tool (*for British Columbia's Ministry of Energy, Mines & Natural Gas*)
- Provided analyses on DSM and renewables efforts and goals for regulatory proceedings on major electricity production projects (*for various Manitoba advocacy groups*)
- Designed an Upstream/Midstream initiative for promoting energy efficient products (*for the Ontario Power Authority*)

- Provided analyses on DSM efforts in support of a rate hearing process (*for various Manitoba advocacy groups*)
- Provided supporting analyses for the re-design of the Quebec home retrofit program Rénoclimat (*for Bureau de l'efficacité et de l'innovation énergétique*)
- Developed a joint Business Case and supporting analyses for a multifuels low-income home retrofit program (*for BC Hydro and FortisBC*)
- Led a team to design a community-based home retrofit program (*for the City of Toronto*)
- Designed a woodstove changeout program in Montreal (*for Équiterre*)
- Provided cost-effectiveness analysis and measures selection for a coupon program in Newfoundland (*for Summerhill*)
- Designed a fuel switching pilot program in Nova Scotia (*for Efficiency Nova Scotia Corporation*)
- Designed a direct-install program for the small business segment (*for Hydro-Québec*)
- Designed and provided implementation support for a low-income home retrofit program in Québec (*for Bureau de l'efficacité et de l'innovation énergétique*)

Other Experiences

- Is currently leading the analytical work for re-designing the Manitoba Low Income Home Retrofit program (*for Manitoba Hydro*)
- Led the development of a model to assess incentive structures for energy retailers (*for the Ontario Power Authority*)
- Conducted the review of U.S. organisations that provide the overlying infrastructure for home retrofit programs (*for the Office of Energy Efficiency*)
- Collaborated to the process evaluation of the TakeCHARGE residential programs (for Newfoundland Power)
- Evaluated the impacts of a woodstove changeout program (*for Équiterre*)
- Led research and analysis for a Canadawide Economic Impact Study (*for Environment Northeast*)
- Developed a cost-effectiveness model for innovative financing in Québec (*for Association québécoise pour la maîtrise de l'énergie*)
- Evaluated impacts of a stove changeout program (*for Équiterre*)
- Developed an energy assessment in support of a regional energy strategy (*for Conseil régional des élus – Iles de la Madeleine*)
- Prepared arguments on development of renewable energy including cost-effectiveness, reliability and policy issues (*for Association québécoise des producteurs d'énergie renouvelable*)
- Designed a mandatory labeling pilot project and province-wide program, with detailed supporting analyses and implementation plan (*for Bureau de l'efficacité et de l'innovation énergétique*)
- Participated in the evaluation of the PACE Maine program - leading the team on contractors' interviews and being in charge of the cost-effectiveness analysis (*for Efficiency Maine Trust*)
- Led a team to provide EM&V guidelines on "Next Generation" technologies and program approaches (*for Northeast energy efficiency partnerships*)

- Participated in the evaluation of a municipal energy efficiency initiative in Massachusetts (*for the Barr foundation*)
- Provided implementation support for a province-wide low-income energy efficiency program in Ontario (*for Ontario Power Authority*)
- Reviewed evaluation methodologies for market effects (*for Hydro-Québec*)

2005-08 MARTIN POIRIER
Independent Energy Consultant

- Analysis and review of various energy related topics (energy efficiency, renewables, energy policy, regulations and rate structures) for environmental and consumer defence organisations

2000-08 INSTITUT DE RECHERCHE ET D'INFORMATIONS SOCIO-ÉCONOMIQUES (IRIS)
Researcher

- Research, analysis and public presentations (conferences, training, media) on the topics of energy, the environment, and public policy
- Analysis of various issues including energy efficiency, renewables, and energy policy
- Stakeholder representative on energy issues for environmental groups

2000–02 ACTION RÉSEAU CONSOMMATEUR ET FÉDÉRATION DES ACEF DU QUÉBEC
Analyst

- Chair of the budget, credit and debt committee – analyses and committee coordination
- Analyses relating to energy and fiscal matters for other committees

1996 – UQAM – CHAIR OF SOCIO-ECONOMIC STUDIES
2000 Researcher

- In charge of energy issues for the chair.
- Research and socio-economic analyses on energy, crown corporations and taxation

education

| | | |
|---------------------------------|---------------------------------|------|
| Master's in Sociology | Université du Québec à Montréal | 2005 |
| Bachelor's in Accounting | Université du Québec à Montréal | 1994 |



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

2017 Meeting Calendar (proposed)

| | | | |
|------------------------|----------------|---------------------|-------------------|
| Thursday, January 5 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, January 19 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, February 2 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, February 16 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, March 2 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, March 16 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, April 6 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, April 20 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, May 4 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, May 18 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, June 1 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, June 15 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, July 6 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, July 20 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, August 3 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, August 17 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, September 7 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, September 21 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, October 5 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, October 19 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, November 2 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, November 16 | 3:30 – 5:30 PM | Full Council | Conference Room A |
| Thursday, December 7 | 3:30 – 5:00 PM | Executive Committee | Conference Room B |
| Thursday, December 21 | 3:30 – 5:30 PM | Full Council | Conference Room A |