Raquel Webster
Senior Counsel

May 1, 2018

BY HAND DELIVERY AND ELECTRONIC MAIL

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

RE: Docket 4654 – The Narragansett Electric Company d/b/a National Grid
2017 Energy Efficiency Year-End Report

Dear Ms. Massaro:

I have enclosed ten copies of National Grid's[1] 2017 Energy Efficiency Year-End Report (Year-End Report), which summarizes the electric and natural gas results, program highlights, and customer experiences during the 2017 program year. The Company has provided a copy of the Year-End Report to the parties in this proceeding.

Thank you for your attention to this filing. If you have any questions, please contact me at 781-907-2121.

Sincerely,

Raquel J. Webster

Enclosure

cc: Docket 4654 Service List
Jon Hagopian, Esq.

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or Company).

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The Narragansett Electric Company
d/b/a National Grid

2017 Energy Efficiency Year-End Report

May 1, 2018

nationalgrid

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Attachments:

Overview

Program year 2017 was successful for National Grid's[1] energy efficiency (EE) portfolio of programs and initiatives. This Year-End report summarizes the gas and electric results, program highlights, and customer experiences over the entire year. The electric and gas programs are described more fully in the Settlement of the Parties, filed in Docket No. 4654 on October 14, 2016 and approved by the Rhode Island Public Utilities Commission (PUC) at its open meeting on December 8, 2016.

The primary goal set forth in the 2017 Settlement of Parties was to "create energy and economic cost savings for Rhode Island consumers through energy efficiency.[2]" The charts below summarize the electric and gas program benefit cost ratios, savings and expenditures compared to planned benefit cost ratios, savings goals, and budgets respectively. The benefit cost ratios are far greater than 1, indicating that the Company's programs created positive value to Rhode Island for every dollar invested in 2017. In total, the 2017 programs will create electric cost savings of $232.8 million and gas cost savings of $45.1 million for Rhode Island customers over the life of the installed energy efficiency measures.

In addition to cost savings, the 2017 energy efficiency programs created significant economic benefits to Rhode Island. The programs supported 726 full-time equivalent (FTE) workers in 2017. Most of the jobs created as a result of energy efficiency investments were local because they were tied to installation of equipment and other materials. In fact, of the 917 companies and agencies involved in National Grid's 2017 energy efficiency programs, 79% were located in Rhode Island.[3] In addition, the 2017 energy efficiency programs will add over $430.3 million to Rhode Island's Gross State Product (GSP).

Another goal of the 2017 Plan was to achieve electric and gas savings targets established in the 2017 EE Program Plan, which were consistent with the goals established for 2017 in the 2015-2017 Three Year Least Cost Procurement Plan. The 2017 electric savings target was 201,347 MWh. At the end of the year, the Company achieved 232,023 MWh energy savings, which represents 115.2% of that goal. The achieved savings equal 3.0% of the referenced 2012 electric load. The Company also had an annual kW savings goal of 28,543 kW, and at the end of the year, it had achieved 29,363 kW savings, which represents 102.9% of that goal.

The 2017 gas savings target was 414,606 annual MMBtu. At year's end, the Company achieved 468,211 annual MMBtu, which represents 112.9% of that goal. The achieved savings represents 1.24% of the referenced 2012 natural gas load. Detailed savings information can be found in Attachment 1, tables E-1, E-2 and Attachment 2, tables G-1 and G-2.

Additional cost and savings information can be found in Attachment 1, tables E-1 and E-3, and Attachment 2, tables G-1 and G-3.

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or Company).
[2] Energy Efficiency Program Plan (EEPP) for 2017, Settlement of the Parties, October 17, 2016, Docket 4654, page 1.
[3] Peregrine Energy, Analysis of Job Creation from 2017 Expenditures for Energy Efficiency in Rhode Island by National Grid, April 2018. Copy included in Attachment 5.

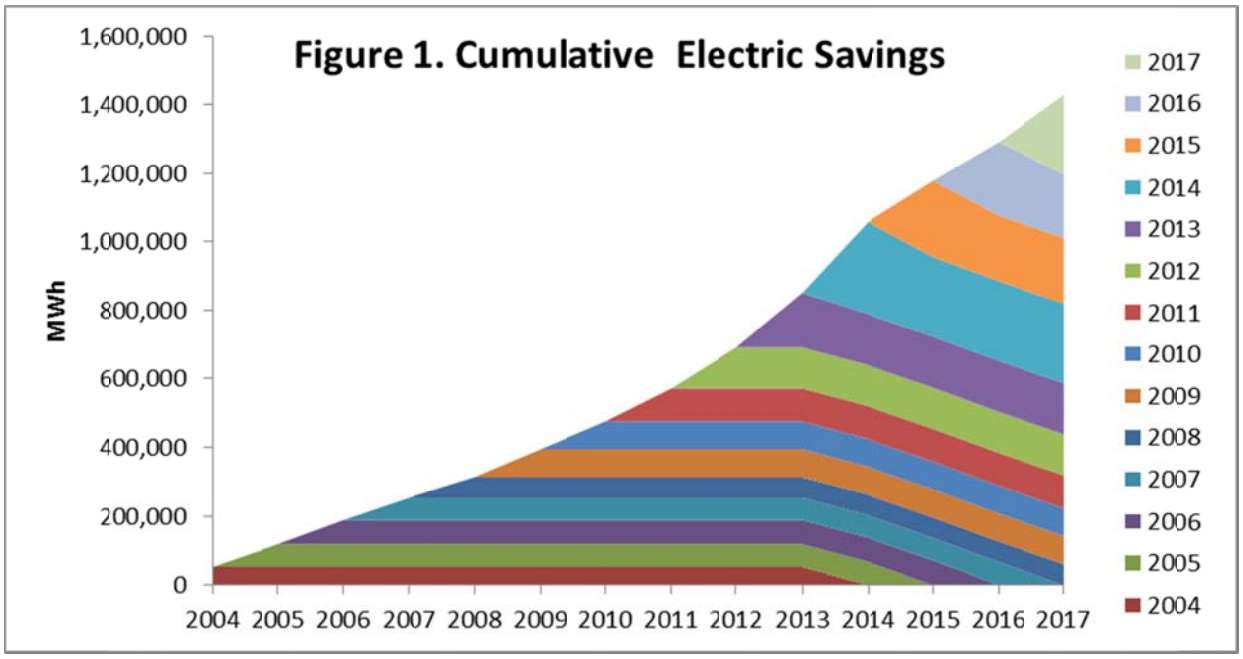
	2017 Goal/Benchmark[4]	2017 Actual[5]	% of Goal
Electric			
Annual MWh Savings	201,347	232,023	115.2%
Annual kW Savings	28,543	29,363	102.9%
Lifetime Benefits ($Mil)	$247.9	$250.0	101%
Benefit/Cost Ratio	2.00	1.91	96%
Gas			
Annual MMBtu	414,606	468,211	112.9%
Lifetime Benefits ($Mil)	$66.6	$70.9	107%
Benefit/Cost Ratio	1.63	1.86	114%
	2017 Budget ($Mil)[6]	**2017 Actual ($Mil)[7]**	**% of Goal**
Electric			
Total Expenditures[8]	$94.6	$94.8	100%
Total Implementation Expenses[9]	$90.1	$90.0	100%
Gas			
Total Expenditures	$29.7	$29.1	98%
Total Implementation Expenses	$28.4	$27.5	97%

A few key factors helped to drive the electric and gas sectors to exceed their 2017 electric and gas savings goals. On the electric side, the transformation of the residential LED market accelerated, leading to LED prices falling to $1/bulb, which pushed the ENERGY STAR® Lighting program to significantly exceed its goal. The transformation of the lighting market also drove higher MWh savings achieved in the Commercial and Industrial (C&I) Retrofit electric program with savings from lighting projects being the principal driver exceeding the MWh savings goal for the C&I electric sector. Savings from combined heat and power (CHP) projects also contributed to exceeding the MWh savings goal. On the gas side, the strong performance was principally driven by the Home Energy Reports gas program. The program well-exceeded its goal due to the fact that gas savings per household continued to ramp up from previous years. Figure 3 in this report illustrates the strong per customer performance of gas savings from the program in 2017. In addition, a high savings rate was notable beginning in September of 2017 and continuing through the fall. The Company will continue to monitor the performance of the program to reflect a more aggressive goal in future planning.

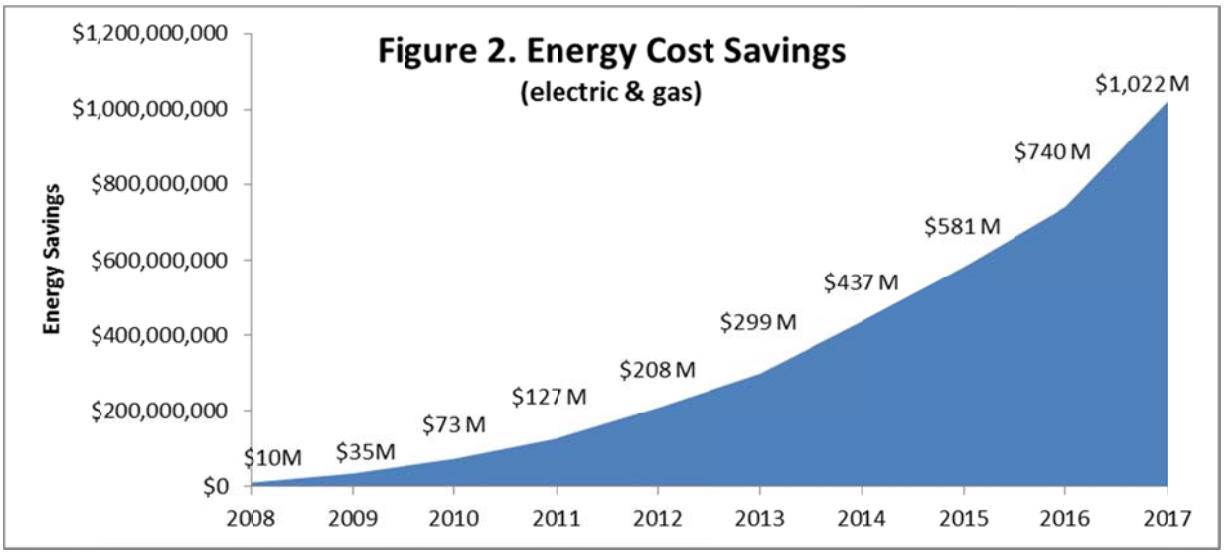
The energy savings achieved as part of the 2017 Plan provided a meaningful contribution to Rhode Island's electricity needs. Since 2004, energy efficiency has saved over 8.9 million MWh at a cost lower than the cost of supply. As shown in Figure 1 below, these savings accumulate over the average ten year lifetime of the installed measures. The only exception is the savings from Home Energy Reports. This

[4] See 2017 EEPP Settlement of the Parties, Docket No. 4654.
[5] Actual savings in 2017.
[6] See 2017 EEPP Settlement of the Parties, Docket No. 4654.
[7] Actual spend in 2017 .
[8] Includes implementation costs, EERMC and OER costs, and shareholder incentive.
[9] Includes all program-related expenses, i.e. incentives, administration and general expenses, marketing, sales, technical assistance, evaluation, and training. Also includes Finance Costs and payments to the Rhode Island Infrastructure Bank (RIIB) as detailed in Tables E-3 and G-3 in this report.

program only has a one-year measure life, and is counted as such in Figure 1. At the end of 2017, the cumulative energy savings met 16% of Rhode Island's electric load.



Since 2008, natural gas energy efficiency programs have also created significant cumulative savings. From 2008 to 2017, over 12.6 million MMBTUs of natural gas were saved. The combination of electric and natural gas savings, procured at a cost that is less than the cost of supply, has created significant savings for customers. As shown in Figure 2, cumulative electric and natural gas savings since 2008 have saved Rhode Islanders $1.02 billion in energy costs.



To achieve the 2017 energy savings goals, the Company employed four strategies initially introduced in the 2015-2017 Energy Efficiency and System Reliability Procurement Plan (Three-Year Plan) in Docket

4522. Below are highlights from the implementation of these four strategies. Details on these strategies, other programs, and initiatives are found in subsequent sections of this Year-End Report.

The first strategy was "Promoting Cost Efficiency." It focused on identifying strategies to deliver energy efficiency serves as cost-effectively as possible, while continuing to optimize the net-benefits of energy efficiency to customers. Examples of promoting cost efficiency included leveraging numerous financial tools including On Bill Repayment (OBR), Heat Loans, and the Efficient Building Fund (EBF), taking advantage of LEDs below $1/bulb, and enhancing code trainings. National Grid continued to work with RIIB and its program administrator, Sustainable Real Estate Solutions (SRS), to advance the concept of C-PACE in the market. In 2017, the main focus was on long term care facilities. In addition, toward the end of 2017, National Grid began working with Ascentium Capital, a specialty financing firm who is a leader in equipment and technology financing solutions, to offer customers another way to finance their projects. A simple, rapid approval loan process allows customers to use their incentive to buy down interest on loans (typically to zero percent depending on the term) for up to $250,000. The Company will continue to offer and examine this option in 2018.

The second strategy was "Empowering communities and markets to be energy efficient." It focused on strategies to increase awareness of energy efficiency programs through the enhancement of existing programs to reach new and repeat customers." The Towns of Smithfield, North Kingstown, Cumberland, and Richmond all joined the Community Based Initiative in 2017 with leadership, town councils, and local elected officials taking to social media, the local papers, and public meetings to express the importance of energy efficiency. At the initiative's conclusion, all four towns surpassed their predetermined goals and won $10,000 to be used for energy efficiency improvements on public properties.

The third strategy was "Innovating to capture untapped savings." National Grid focused on meeting this strategy through the Connected Solutions Demand Response pilot which saw average curtailment per demand response event of 10.6 MW in the summer of 2017 and the Connected Device Demonstration which saw the number of customer thermostats enrolled increase to over 930 and average curtailment of 0.5 KW per device during each event.

The fourth strategy was "Developing opportunities for system-level savings and integration." During 2017, the Company participated in Docket 4600 "Investigation Into the Changing Electric Distribution System" and the Rhode Island Power Sector Transformation initiative. During 2017 the Company began to incorporate outcomes of these proceedings into its Annual Plans with the inclusion of the RI Test and beneficial electrification of heating in its 2018 Plan. In addition, the Company continues to pilot new technologies around demand response and automation to begin educating customers on real-time management of energy consumption to prepare them for future tools that may be available through grid modernization.

The following sections in this report outline the highlights for the different programs and initiatives that comprise the 2017 Rhode Island Energy Efficiency Portfolio. Many activities undertaken in 2017 laid the foundation for inclusion in the 2018 Energy Efficiency Program Plan, which the PUC approved in Docket 4755 at Open Meeting on January 9, 2018.

Residential Programs

Overview

In 2017, the residential sector was cost-effective with total resource benefit cost (B/C) ratios of 1.73 for electric programs and 1.32 for gas programs. The Company spent 97.5% of the electric residential implementation budget, achieved 120.2% of electric targeted annual energy savings, and achieved 125.1% of electric targeted annual demand savings. The Company spent 98.3% of the gas residential implementation budget and achieved 134.3% of gas targeted annual energy savings. The Company was able to administer the programs so that the sector had a strong finish in both fuel types. Additional details on spending and savings by program can be found in Attachment 1, tables E-1, E-2, E-3 and Attachment 2, tables G-1, G-2 and G-3.

EnergyWise

As the flagship in-home energy efficiency program, EnergyWise provides immediate energy savings and educates RI customers on their home's energy usage. The first step, for customers that are curious about how their home uses energy, is to schedule a no-cost home energy assessment. During the assessment, a two-person team of energy specialists walks through the home with the customer and educates them on how energy is being used and where there may be losses through air leaks in the building envelope. Leaks are one of the largest sources of energy loss and frequently occur where different building materials come together such as where the foundation meets exterior siding or where roofing materials and chimneys meet. There can also be air leakage around window and door frames, electrical outlets, fireplaces, and in attics and basements. By sealing up air leaks and increasing insulation levels (collectively called weatherization), a home can be much more comfortable while also saving the home owner energy and money.

One of the energy specialists will focus on installing efficient lighting, water savings fixtures, pipe insulation, programmable thermostats, and advanced power strips. All these products provide immediate energy savings to the home owner. The other energy specialist will work directly with the customer to explain findings about the home's heating and/or cooling system, appliances, and insulation levels. During the basement to attic walk through, any health concerns that could impact proceeding with weatherization will be communicated and included in the final summary of the assessment. At the end of the two-hour visit, a comprehensive summary will be provided to the customer with any available incentives for weatherization, heating and water heating systems, and appliances.

Should a customer decide to continue with the weatherization recommendations, an independent insulation contractor (IIC) will be scheduled at a mutually convenient time. The weatherization work could take a full day or up to several days to complete depending on the size of the residence. At the completion of the weatherization visit, an inspector will review all of the completed work to ensure that nothing was overlooked and that best practices were applied. A secondary verification on both the assessment and weatherization is conducted by an independent company on five-percent of all work to ensure that customers are receiving the best quality work possible. Quarterly best practice meetings between the Lead Vendor and the IIC's present an opportunity for knowledge sharing of different technologies and approaches that can simplify weatherization work.

Overview of Performance

In 2017, the EnergyWise electric program achieved 105% of its MWh savings goal, and gas program achieved 98% of its MMBTU savings goals. 2017 was a challenging year for EnergyWise in some respects. While the program performed well, it required concentrated marketing and promotions to encourage participation. 2017 was a warmer than average temperature winter in the beginning of the year (January – March) and energy efficiency upgrades were not at the top of consumer's minds. Combined with a reduction in the cost of delivered fuels and natural gas, lower energy bills made energy efficiency less of a priority. Additional marketing was used to increase awareness and short-term, enhanced incentives encouraged consumers to act on weatherization recommendations. Natural gas customers that activated their contract in the second and third quarter of the year received a bonus for participation. Delivered fuel customers also received enhance incentives in the third and fourth quarter. Over 9,000 customers received home energy assessments and 3,275 customers proceeded with weatherization. 836 customers financed energy efficiency upgrades with the 0% Heat Loan totaling $8.9 million in improvements.

Highlights

In 2017, EnergyWise was awarded the ENERGY STAR® Partner of the Year award for implementation by the U.S. Environmental Protection Agency and the Department of Energy for the second consecutive year. Sixteen Independent Insulation Contractors also received the Century Club Award from ENERGY STAR® for completing 100 or more weatherization projects during 2016. Rhode Island is a recognized leader in protecting the environment through energy efficiency and for the outstanding quality and volume of customers served in Rhode Island.

Customers provide the best testimonials and following is a sample of customer feedback about the program:

- The Energy Wise program enabled us to make sorely needed improvements to our home's energy efficiency for an affordable price. We couldn't have managed to make the changes without the program incentives, so we're very grateful for them. It's great to save money AND energy -- both were very important to us in going ahead with the program. We immediately noticed that our house was warmer, and our energy bills were lower in the next billing cycle. It was also extremely helpful to have the energy assessments done by a (mostly!) uninvested third party (i.e., not an HVAC company) so we could get the facts about our boiler, insulation, etc.
- I have already recommended the program to others. The difference in our house is unbelievable! The subcontractor, Phil was extremely professional and did a great job explaining the work that they did. They actually did more than what the contract included because he wanted to do the job 'right'. The auditor was very knowledgeable too. For the first Winter in 13 years in my home, I'm FINALLY comfortable! It almost brings tears to my eyes. Thank you so much! -Kate
- I think it is a great idea and great help from National Grid to better serve its customers. I believe that National Grid went above and beyond with the EnergyWise program. It shows how the Company cares about people it serves about the neighborhood and especially new and young first home buyers. I would like to say on behalf of my family thank you. H.A

- I would recommend an energy assessment for all homeowners.

In 2017, the EnergyWise program began installations of Wi-Fi enabled thermostats and customers appeared interested in the new offering. The Lead Vendor also supported the pilot program Connected Solutions with additional Wi-Fi thermostat installations. EnergyWise also provided enhanced feedback to IIC's on a weekly cadence. The SolarWise pilot from 2016 was sun-setted to facilitate customer participation in Renewable Energy Growth.

ENERGY STAR® Lighting

ENERGY STAR® Lighting allows all customers in Rhode Island the opportunity to experience energy efficiency. By having low cost light bulb replacements available where consumers shop, customers can make an impulse buy or plan ahead and purchase lighting that is reasonably priced, bright, and energy efficient. National Grid works with a Lead Vendor that provides vendor outreach and education to make sure that retailers can promote the benefits of efficient lighting and have displays set up that feature the incentives provided by the ENERGY STAR® Lighting program. The Lead Vendor also recruits new retailers, staffs special education events within retailers, and supports memorandums of understanding that layout the midstream (retailer) and upstream (manufacturer) for markdown items at retail. Social media promotions with flash sales have been popular during the past few years.

Overview of Performance

The ENERGY STAR® Lighting program achieved 130% of the savings goal while reaching over 435,000 participants. This strong performance was driven in large part by a decline in the price of LED bulbs, along with a strong network of vendors and distributors to educate and promote the products among retailers and consumers. Importantly, in 2017, the ENERGY STAR Lighting program transitioned to supporting all light emitting diode (LED) technology which is being well received by consumers.

Highlights

In 2017, customers fully embraced LED lighting as pricing, including available incentives, reached the $0.99 per bulb mark. This made lighting affordable for the majority of customers. Combined with the breadth of products, shoppers found they could purchase the color of lighting they preferred – daylight or bright white, allowing the program to achieve robust sales. The ENERGY STAR® Lighting program enhanced the hard-to-reach offering by partnering with foodbanks for distribution no-cost two-packs.

Retailer training was supported with on-line offerings as well as in person trainings. The on-line offering allowed the program to reach sales associates that were not available for live trainings and provided consistent reinforcement of energy efficiency elements. The on-line training also allowed retailers to train new employees and allowed the employees an opportunity for training that fit into their work schedules.

ENERGY STAR® Appliances

In 2017, the ENERGY STAR® Appliances program focused on efficient dehumidifiers, dryers, room air cleaners, room air conditioners, pool pumps, advanced power strips, refrigerator recycling, and efficient shower heads. This program works in tandem with ENERGY STAR® Lighting by leveraging resources with

in store retailer visits and social media campaigns when appropriate. The same online training platform is also used within this program and is a critical resource for retailers when there are numerous products and features associated with the different appliances.

Overview of Performance

The ENERGY STAR® Appliances program reached 95% of its savings goal while serving over 14,500 customers.

Highlights

The ENERGY STAR® Appliances program had a successful year with strong performance in pool pumps, dehumidifier recycling, and dryer incentives. Rhode Island is very fortunate to have supportive appliance retailers that host recycling events as well as EcoDeport in Johnston, RI. The refrigerator and freezer recycling program is operating at forecasted levels and was able to support a short-term enhanced incentive in the fall of 2017. 2017 also marked the closing of local RI retailer, Benny's, which was a strong supporter of both the ENERGY STAR® Lighting and Appliances programs in all twenty-two of its RI retail stores. Eighteen consumer outreach tables were staffed in different retailer locations throughout the year. The tables provide an opportunity to engage with customers during their everyday shopping experience and to promote energy efficiency.

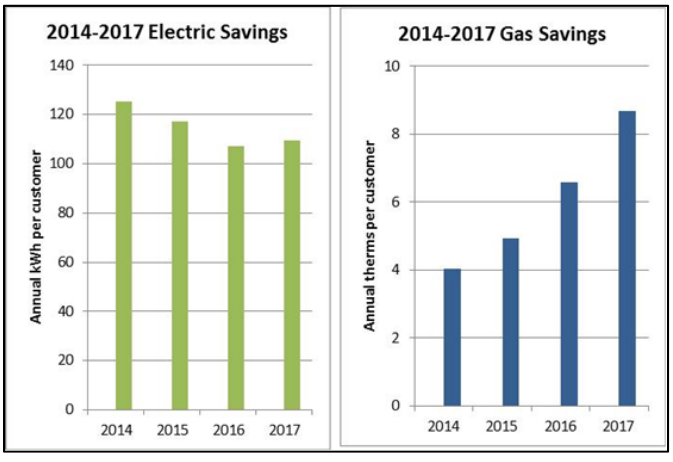
Home Energy Reports

In its fifth year running, the Rhode Island Home Energy Reports (HER) program continues to encourage energy efficiency behavior through personalized print and email reports, and a seamlessly integrated website. Each of the communication channels displays energy consumption patterns and contains a normative comparison to similarly sized and similarly heated homes, as well as to an energy reduction goal for each customer. In 2017, more than 30,000 customers were added to the HER program, resulting in 292,136 Rhode Island customers receiving reports in total that year.

Overview of Performance

In 2017, the HER program saved customers 30,451 MWh and 103,087 MMBtu, reaching 116% and 174% of the Company's electric and gas goals, respectively. These savings numbers are equivalent to over $7M million dollars in customer bill savings. The reports not only provide valuable EE savings, but also provide a communication the customer finds valuable; in fact less than 2% of all customers have opted out of the program.

Figure 3. Home Energy Report Savings



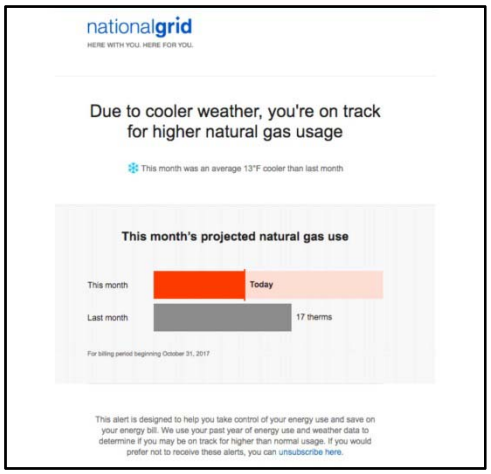
The gas program performed better in 2017 than any year prior, and also better than

expected. There was continual improvement of the gas savings rate over time, and much less volatility in 2017 than in years past. A high savings rate was especially notable beginning in September of 2017 and continuing through the fall. Gas usage variability is largely due to the influence of weather on gas heating, and this is another contributing factor in the over-performance on the gas side.

Highlights

In 2017, Rhode Island continued to be a leader in behavioral energy efficiency innovation and customer engagement. National Grid launched email High Bill Alerts for customers, created targeted messaging for low income customers, released a new home audit on the web, and ran a customer satisfaction campaign aimed at reengaging customers and improving sentiment.

- **Low Income Messaging:** National Grid created specific messaging to assist low-income customers through Home Energy Reports and High Bill Alerts. The updated communications provide no-cost tips for reducing energy usage and familiarize low income customers with Rhode Island income assistance programs.
- **Web Audit:** In May of 2017, a new Home Energy Analysis widget was released on National Grid's website. The new, modern, engaging widget allows a customer to easily pause and resume the survey, and feeds those answered audit questions back to National Grid to give a more holistic view of the customer. The audit asks the customer questions about their home, heat type, and behavior to help National Grid better target future messaging.
- **Customer Satisfaction Campaign:** Spring of 2017 was dedicated to a customer satisfaction campaign aimed at touching all of the customers receiving Home Energy Reports. The campaign's goals were to remind National Grid customers about the value of the reports, include customized insights, thank them for their participation, and show customers they are a part of a larger effort to reduce residential energy consumption. The campaign involved messaging in print and email reports over the course of three months.



- **High Bill Alerts:** In May 2017, National Grid launched email High Bill Alerts to over 100,000 eligible customers. These alert emails, which use weather data and historical usage data, were sent to customers when they were deemed to be on track for a high bill. Over 135,000 email alerts were sent in 2017 and early indications are that there are small, but incremental savings being generated from this effort.
- **Continued Strong Engagement**: A 2017 survey of ~805 RI customers showed that 81% of recipients reported not only reading the HERs but liking them (up from 75% liking in the previous survey). The survey showed additional gains in brand perception, with HER recipients 9% more likely to perceive National Grid as wanting to help

them save money, and manage their monthly energy use. This survey further cements the value the HER reports provide to customers, and the Company will continue to leverage the HER reports to provide engaging insights, and useful tips to its customers.

Residential New Construction

The Rhode Island Residential New Construction (RNC) program guides building professionals and homeowners through the process of designing and building an energy efficient home. The RNC process includes: educational outreach, no-cost plan analysis, advanced energy consulting, in-field technical assistance, insulation and air sealing analysis, third-party blower door and duct blasting testing, installation of high-efficiency lighting (LEDs), energy-saving showerheads, a HERS (Home Energy Rating System) Index rating and energy performance-based incentives.

Based on the year-over-year increase in Tier II and Tier III projects in 2014 and 2015, the Company increased the Tier I and Tier II requirements beginning in 2016 as a means to continue transforming the market. The requirements in 2017 remained the same as in 2016.

Tier Level	2015 % More Energy Efficient Than Baseline*	2016 % More Energy Efficient Than Baseline*	2017 % More Energy Efficient Than Baseline*
Tier I	15% - 24%	15% - 30%	15% - 30%
Tier II	25% - 44%	31% - 44%	31% - 44%
Tier III	45% or more	45% or more	45% or more

*Based on the 2011 User Defined Reference Home

Overview of Performance

Due to the nature of construction schedules the full impact of adjusting the minimum requirement for Tier I and Tier II in 2016 was seen in 2017. Of the 396 homes achieving Tier I or Tier II in 2016, 64% achieved Tier II. Of the 429 homes in 2017 achieving Tier I or Tier II in 2017, 36% achieved Tier II. The Program still exceeded the goal for the number of Tier III homes in 2017. Despite a lower than projected total number of completed units achieving Tier II, the savings goals were exceeded due to the increase in program participation.

	2017 Goals	**2017 Total**
Tier I (15 - 30%)*	215	338
Tier II (31% - 44%)*	175	154
Tier III (45%+)*	10	12

*Based on the 2011 User Defined Reference Home

Type of Construction	Tier Level	2017 # of Projects
NEW CONSTRUCTION	Tier I	214
	Tier II	134
	Tier III	12
RENO/REHAB	Tier I	124
	Tier III	20
	Tier III	0

Market rate enrollments exceeded expectations, which may indicate an upturn in the new construction industry in RI. Several of these projects were conceived or permitted almost 10 years ago when the industry was booming, and then abandoned and recently sold to new developers that wanted to rent properties.

The year 2017 brought an increase in non-gas heated homes. Developers chose to install heat pumps instead of gas heat systems in both new construction projects and renovation-rehab projects. Forty-eight percent (48%) of total completed units were not heated by natural gas, which is up 35% in 2016 and from an average of 10% in prior years.

A significant portion of the savings claimed in the Residential New Construction Program came from Codes and Standards. For more details on Codes and Standards see page 21.

In 2017, the RNC Program participated in several efforts to further the advancement of high performing homes in RI.

- RI Zero Energy Task Force – Residential Sub-Committee: In an effort to promote and capitalize on the RNC offerings, the RNC team worked with OER and the Residential Sub-Committee Group to develop the outline of objectives for meeting the zero energy goals set forth in the Task Force's Whitepaper Report.
- RI Building Science Discussion Group: This is a bi-monthly meeting to discuss topics pertaining to High Performance Building best practices as well as high performance verification programs such as Energy Star and Passive House. Zero Energy and innovative design are also discussion topics for this group.

Trainings:

Seventeen classroom trainings were held in 2017 with 448 attendees (11 residential trainings with 298 attendees and 6 commercial trainings with 150 attendees). Seven location trainings were held with 65 attendees. 60% of attendees were code officials, and 23% were builders and general contractors.

As an initial step to create an open HERS rater market, outreach was provided to individuals who provide third-party verification in RI, such as those who perform energy code compliance testing, and those who have Building Performance Institute (BPI) certifications. A formal five-day HERS Rater training will be provided in 2018. Expanding the HERS rater market will create a larger local network of RI-based

energy efficiency professionals, promote workforce training and development, and will facilitate the successful transition to a fully open-rater program model in which Rhode Islanders can compete effectively with experienced HERS raters from surrounding states.

Collaboration:

In addition to providing trainings throughout the year to builders, developers, architects, HVAC contractors, and clients, National Grid RI RNC participated in many events to promote energy efficiency, including:

- Northeast Building Official Education Association (NEBOEA).
- RNC staff has provided technical guidance for RIH's Design and Construction Guidelines document, which outlines the process, requirements and timelines for eligibility, and works with projects to achieve Tier II wherever feasible.
- Coordination with the RI Energy Efficiency Commercial and Industrial Program to address projects that have both residential and C&I requirements.

High Efficiency "HVAC" (Electric and Gas) - Heating, Cooling and Hot Water

The High-Efficiency Heating and Cooling Programs promote the installation of high efficiency gas and electric space heating and cooling equipment, water heating measures, and controls through the use of tiered customer rebates. The programs also provide contractor training and incentives for proper equipment sizing, quality installation verification and distribution system improvements.[10]

Overview of Performance

In 2017, the Electric Heating & Cooling program achieved 119%, and the Gas Heating program achieved 108% of their respective savings goals. Solid working relationships were maintained with the trade ally network of HVAC contractors and equipment distributors participating in the program. Based on customer feedback, a lower tier boiler was brought back to the program in 2017 to provide customers a lower price point for a high-efficiency unit.

Highlights

The program's lead vendor continued to provide outreach and programmatic support to participating contractors to ensure they had the knowledge to effectively communicate the program offering to customers, and the technical expertise to offer quality installations. In 2017, the Program participated in 15 industry events (counter days, outreach events, 2017 RI Home Show), held five AC Check trainings and one trade ally program meeting.

In 2017, the Program offered a Wi-Fi thermostat promotion which resulted in 57% of the overall gas savings for 2017.

Mini-Split Heat Pumps (MSHP) continue to increase year after year on the electric side and the Company expects them to continue to rise in 2018 based off market trends in the industry. The lead vendor

[10] Residential programs do not promote or fund fuel switching. It is only after a customer decides to switch to natural gas that they are eligible for an energy efficiency rebate. At the time the customer switches from another fuel to natural gas, they become eligible for an energy efficiency incentive that covers part of the incremental cost of higher efficiency gas equipment.

developed a testing procedure that will help transform QC efforts. The goal is to reduce call backs and insure the savings are accurate by verifying the charge through quick analysis and measurements instead of tapping into the line with gauges. This comes as a big benefit to the MSHP industry as it boosts the credibility of the technology if installed and working properly. The Company believes it will have a large impact on the market, and potentially transform it.

Multifamily

The Rhode Island Multifamily Retrofit program serves market rate and income eligible gas and electric customers as well as commercial gas customers. In 2017, the Company concluded the Request for Proposals (RFP) process for a lead vendor to serve all the above noted programs and began implementing new approaches and measures to prepare for the future and bring increased value to customers.

Overview of Performance

The Market Rate Multifamily Retrofit program achieved 75.9% of the electric goal and 114.1% of the gas goal. The 2017 program year saw a shift to serving more customers in condominium complexes, which traditionally have lower participation rates thus contributing to lower performance. In addition, the lead vendor experienced fewer opportunities for retrofit while on site due to high historical program participation and measures previously installed.

The Income Eligible Multifamily Retrofit program achieved 145.6% of the electric goal and 111.3% of the gas goal. Strong successes in this program are due in part to the offering of heating systems which brought more electric customers into the program and provided substantial savings on the gas side. Further, the much smaller C&I Multifamily Gas program had a very strong year finishing at 213.0% of goal due to a large project that concluded in December. The C&I multifamily gas budget is approximately 40% the size of the residential market rate and income eligible budgets and can be easily impacted by a single project, as was the case in 2017.

Highlights

Conclusion of Lead Vendor RFP: In the first quarter of 2017, the Company concluded interviews for the lead vendor role to serve all RI multifamily retrofit programs. After considering four strong firms, RISE Engineering was chosen as lead vendor for their ability to address innovation, cost competitiveness, job creation, and health and safety. The new contract began in the summer of 2017 and many of the new approaches that resulted in RISE Engineering securing the contract are already underway in the program.

Boiler Monitoring and Optimization Demonstration**:** In 2017 the Company conducted a boiler monitoring and optimization demonstration of heating and domestic hot water systems at 10 income eligible buildings in Rhode Island to determine potential savings through optimization strategies. Building and utility data was considered from the 475+ buildings that were benchmarked in 2014-2016 program years. Monitoring equipment was installed on the selected buildings and data analyzed through the year. An independent report conducted by a third party will be submitted to National Grid in April of 2018.

Heating System Installations: In late spring of 2017, the Company's lead vendor began installing efficient gas central heating systems at income eligible properties. In total, 61 systems were installed benefitting hundreds of Rhode Island customers. The heating system installations contributed to over performance in the income eligible multifamily gas program and generated a pipeline for the electric program.

Condo Web Portal Development: To increase condominium unit participation in the multifamily program, a website was created by RISE Engineering to allow for online program sign up. Customers are now able to log into a custom website that displays their facility and the recommended measure list from which the customer may choose the items to be installed in their unit. Twenty-four (24) properties took advantage of the online sign up in H2 2017.

Serving Delivered Fuel Facilities: In 2017, the Company began serving multifamily facilities heated with delivered fuels such as oil and propane. This offering provided approximately $276,000 worth of measures to customers in both the market rate (12 facilities) and income eligible (5 facilities) programs. Such measures included thermostats, showerheads, pipe wrap, insulation, air sealing and aerators.

Community Based Initiative: Rhode Island Energy Challenge

The Rhode Island Energy Challenge (Challenge) completed its fifth year in 2017 by surpassing goals and creating new partnerships. The program, with grassroots efforts managed by the non-profit SmartPower, created revised engagement metrics for 2017 that required municipalities to undertake deeper participation to achieve their goals.

Cumberland Mayor William Murray and Town Council Members gather to support the Initiative

In the past, municipalities were celebrated when 5% of residents made the pledge to be more energy efficient by committing to find four ways to save energy in the home. In 2017, towns committed to running promotional efficiency campaigns, creating energy committees or advisory groups and signing customers up for more EnergyWise home energy assessments than the prior three-year average.

Overview of Performance

The Towns of Smithfield, North Kingstown, Cumberland, and Richmond all joined the initiative with the passage of town council resolutions and began promotions in early summer of 2017, running campaigns for the next six months. Leadership, town councils, and local elected officials took to social media, the local papers, and public meetings to express the importance of energy efficiency. At the initiative's conclusion, all four towns surpassed their predetermined goals and won $10,000 to be used for energy efficiency improvements on public property.

A main call to action was for residents to have their home energy assessments and local elected officials led by example by beginning with their EnergyWISE assessments in July and August of 2017. Throughout the year these leaders spoke with the community about the benefits of the program with first-hand

knowledge of the services offered. Program progress was a frequent topic on all town council agendas to inform leaders and the community where they stood to goal. All towns exceeded the prior three-year average of audits that took place in the communities and ended the campaign by generating 1,361 requests for assessments.

Another success for 2017 was the creation of energy efficiency task forces or committees. All towns created volunteer advisory groups to help carry on the spirit of the initiative after its conclusion in December. The Town of Smithfield's Recycling Department worked closely with the Company and vendor SmartPower, to identify events in the community and distribute materials to residents. The Cumberland Office of Children Youth and Learning (OCYL), along with the Mayor's Youth Commission, ran summer and fall projects about efficiency, created program materials for their families, and drafted a letter to the editor of the Valley Breeze. Further, the Town of Richmond created a formal Energy Challenge Committee through the Town Council that continues in identifying efficiency projects well into 2018.

Highlights of the 2017 Community Based Initiative

- 1,361 Assessments requested in four partner-towns.
- Creation of energy efficiency committees made up of local volunteers and elected officials.
- Six-month partnership with Cumberland Office of Children, Youth and Learning (OCYL).
- Program promotions with the Northern Rhode Island Chamber of Commerce.
- Volunteer events at Smithfield High School, Middle School and Elementary School open houses generated over 100 Assessments in under two weeks.
- Numerous letters to the editor and feature stories in local media covering the initiative.

Residential Energy Efficiency Education Programs

In 2017, National Grid continued its support of the energy education curriculum and teacher professional development in partnership with the National Energy Education Development (NEED) Project. Over 60 Rhode Island teachers and 80 students had the opportunity to learn about energy and energy efficiency in 2017 through this project.

In 2017, two workshops were hosted for teachers to help integrate energy and energy efficiency education into the classroom. The two teacher workshops were packed with energy information, hands-on STEM activities focused on energy, and the opportunity to learn more about National Grid's programs in Rhode Island. Hosted in Providence and in Warwick, teachers from across the state spent the day learning how to improve the teaching of the science of energy, sources of energy, electricity generation, transportation and efficiency and conservation.

Teachers that participated in the workshops received NEED Science of Energy Kits, designed to teach forms of energy and energy transformations, and Monitoring and Mentoring Kits that were filled with tools to complete energy research and analysis to better understand energy use in their school buildings. Students assess energy use in the school building and take the lessons home to reduce energy use at home. Teacher surveys indicate these efforts will reach approximately 6,000 students.

In addition to the workshops, Merit Badge sessions were held at the Boy Scout Merit Badge College. A new initiative in 2017, NEED trainers led over 80 participants through hands-on lessons that helped them understand various energy topics including the science of energy and energy transformations, renewable and nonrenewable energy sources, electricity generation, and residential energy efficiency. The Scouts prepared presentations on energy use and completed a home energy audit after attending Merit Badge College.

Income Eligible Services

The Income Eligible Services (IES) program helps reduce electricity and heating costs for residential income eligible customers without any financial contribution from the customer. Income Eligible Services are delivered by Rhode Island's six local Community Action Program (CAP) agencies to customers who are currently on the A-60 or 1301 Low Income Discount Rate; or who qualify for LIHEAP funds from the State with household income levels below 60% of the Area Median Income (AMI). Services offered to Income Eligible Customers include (1) an energy assessment of lighting, appliances and behavior to determine baseline consumption and potential energy use reductions (2) a thorough inspection of the customer's home to identify opportunities for weatherization, and (3) a safety and energy efficiency inspection of the customer's heating/cooling system for potential health, safety and energy saving improvements. All customers receive service and equipment upgrades at no cost.

The program continued to benefit from program improvements resulting in an increase in the number of assessments by 5% from 2016 to 2017 – to a total of 2,639 assessments. The program saw a significant jump in air conditioner replacements by 90% to 1,102 units. The increase in air conditioner replacements may be due to increased frequency of long stretches of hot days. In 2017, targeted marketing efforts were delivered to income eligible communities to increase awareness and participation in the program. IES initiated the development of an AMP Manual that will outline the steps and goals of the AMP Assessment. This manual is designed to increase consistency with AMP Assessments across the six CAPs. Overall, IES exceeded the gas goals, but missed the electric goals as a result of installing fewer LEDs per home than planned. LEDs are installed only in place of existing incandescent bulbs. LED bulbs are available at such low price points that customers are often installing them on their own.

Income Eligible Program/WAP Collaborative

National Grid's Income Eligible Services are administered along with related and complementary federal, state, and local programs in collaboration with the Rhode Island Department of Human Services (DHS), CAP agencies, and other local agencies.

Low Income Home Energy Assistance Program (LIHEAP)

The Low Income Home Energy Assistance Program (LIHEAP) block grant is funded through the U.S. Department of Health and Human Services. The purpose of LIHEAP is to assist Rhode Island's income eligible households in meeting the increasing costs of home energy and reduce the severity of any energy-related crisis. Rhode Island's LIHEAP is administered by the Rhode Island Department of Human Services (DHS) Individual and Family Support/Community Services Division. LIHEAP intake and outreach

is provided by the six local CAP agencies. Households are determined eligible for LIHEAP assistance according to income guidelines established by DHS.

Weatherization Assistance Program

The Weatherization Assistance Program (WAP) enables income eligible families to reduce their energy bills (and helps LIHEAP funds go farther) by making their homes more energy efficient, while addressing health and safety concerns. Funds are used to improve the energy performance of income eligible dwellings using the most advanced technologies and testing protocols available in the industry.

WAP is funded through annual appropriations from the U.S. Department of Energy's Weatherization Assistance Program and the U.S. Department of Health and Human Services. The state allocates 15% of its annual LIHEAP funding to weatherization.

Commercial & Industrial Programs

Overview

In 2017, the Commercial & Industrial (C&I) sector was cost-effective with total resource B/C ratios of 1.92 for electric programs and 2.03 for gas programs. The Company spent 103.2% of the electric C&I implementation budget, achieved 111.0% of the annual electric savings target and achieved 88.5% of the annual demand savings target. The Company spent 93.8% of the gas C&I implementation budget and achieved 100.3% the annual gas savings target. Additional details on spending and savings by program can be found in Attachment 1, tables E-1, E-2, E-3 and Attachment 2, tables G-1, G-2 and G-3.

Large Commercial and Industrial Programs

National Grid offers two programs for large commercial and industrial customers with an average monthly peak demand in excess of 200kW. Each program contains a few common elements:

1. National Grid offers incentives to reduce the incremental cost barrier to investing in energy efficiency.
2. The programs are integrated to offer assistance with gas and electric projects at the same time.
3. National Grid reduces barriers to participation by offering a range of technical assistance from identifying opportunities to improving a company's manufacturing process.
4. Depending on the program year and budget, National Grid may also have funds available to provide business owners with zero interest loans for a defined period of time with on-bill payback.

Education and Outreach

National Grid offers training and education to various entities that enable energy efficiency in the marketplace and communities in Rhode Island. These include architects, engineers, and lighting professionals. In 2017 the Company conducted 13 webinars on various topics that included advanced lighting and controls to benchmarking and best practices for small HVAC systems. The Company also conducted three seminars for TEC RI on Managing Demand and Capacity Charges, Deep Retrofits and Financing Alternatives and on Renewable Energy. In addition, National Grid sponsored events like the

ABX and Green Build 2017 where National Grid experts presented on the RI and MA Energy Efficiency Programs. These events are excellent educational and outreach opportunities for the Company's regional stakeholders.

Large Commercial New Construction

The Commercial New Construction Program encourages energy efficiency in new construction, major renovations, planned replacement of aging equipment, and replacement of failed equipment through financial incentives and technical assistance to developers, manufacturers, vendors, customers, and design professionals. The program supports both commercial and industrial new construction projects with proactive technical assistance during the design phase by utilizing energy modeling and analysis.

In 2017, market interest in new construction continued due to an improving economy. As the economy continues to strengthen, the Company expects to see growth in new construction projects materialize over the next 3-5 years.

The year 2017 saw more projects covering a range of building types demonstrating the ongoing increase in commercial and industrial development in Rhode Island. Projects included mid-size multifamily, university buildings, garage buildings and large commercial projects.

Street Lighting

In 2015 National Grid launched a Solid State Street Light Initiative that provided energy efficiency incentives for solid state street lighting and controls to municipal customers. There are two options for participating in this initiative, customer owned and Company owned.

Customer Owned Street Lighting- Rhode Island municipal customers are now eligible to purchase their own street lights from National Grid. Incentives are offered for solid state lighting and controls, as funding allows. National Grid worked closely with RI OER as well as cities and towns to change the tariff to allow the state, as well as other entities, such as the RI Airport Corporation and fire districts, to purchase their own street lights.

Company Owned Street Lighting – National Grid filed a Company-owned street lighting tariff in 2016. This tariff's effective date was January 2017. If a municipal customer prefers to continue leasing their street lights from National Grid, the customer will receive the incentive and the Company will claim the savings.

Participation in this initiative has expanded to four communities in Rhode Island as well at the RI Highway department. The four communities are: Providence, Barrington, Bristol and Cranston. In 2017 LED Street lighting and controls accounted for 6,800 MWh in savings.

Demonstration Projects

Zero Energy demonstrations: In 2016 the Zero Energy Building (ZEB) Task Force, that included key stakeholders in Rhode Island, wrote a white paper called "Zero Energy Building Pathway to 2035". The white paper made many recommendations that included establishing a ZEB committee comprised of representatives across a wide range of organizations and stakeholders such as state agencies, building professional associations, the utility, builders and developers, solar industry representatives, business

and finance community, including members of the ZEB Task Force. In 2017 a ZEB Committee and a C&I ZEB Sub Committee was formed. The C&I Sub Committee meet on a regular basis. The Company is part of the Committee and Sub-Committee and in 2017 helped set goals outlined in the whitepaper that will be achieved in the coming years.

Large Commercial Retrofit

The Large Commercial Retrofit Program encourages the replacement of existing equipment and systems with energy-efficient alternatives when the customer is not otherwise planning any investments. The program offers solutions ranging from steam trap repair and Combined Heat and Power (CHP), to multiyear Strategic Energy Management Plans (SEMPs) with some of National Grid's largest customers, and a variety of Upstream programs.

In 2017, National Grid had several notable developments in the Large Commercial and Industrial space. The Company went broader by expanding the Upstream Products Initiatives, continued its partnership and goals with its three SEMP customers that include a large university, the State of Rhode Island and a large health care provider in Rhode Island. The Company also engaged more customers in the industrial, grocery, and municipal verticals.

The Company continued work on the SEMP with the State of Rhode Island that began in 2016. In 2017, 27 scoping studies and one retro-commissioning study were performed in state facilities.

The large commercial retrofit program also includes an industrial initiative with world-renowned engineering firm Leidos and training for trade allies among many other efforts.

Industrial Initiative

The Industrial Initiative in Rhode Island had another very successful year. Goals for electric and gas were exceeded and delivered substantial savings to Rhode Island manufacturers. A total of 89 incentive applications were paid (66 electric and 23 gas) resulting in savings for 38 large industrial customers. The program continues to focus on custom process measures with 82% of the applications relating to process, HVAC, variable frequency drives (VFDs), and other custom measures.

Energy Smart Grocer

The EnergySmart Grocer (ESG) initiative delivered cost effective, comprehensive energy savings in the Grocery market segment in 2017. Notable projects include a chain grocery store in Cranston, RI that will be the first project using CO^2 as a refrigerant that the ESG initiative has supported. The program also had another strong year with the largest independent grocery chain in Rhode Island. This chain completed projects with ESG totaling over 1 million kWh making for a third strong year in a row. Other customer

projects included chain wide anti-sweat heat controls (ASHC) implementation with a national grocer at their Rhode Island stores providing 1.4 million kWh savings. 2017 also saw an influx of projects with smaller local grocers.

Combined Heat and Power (CHP)

Interest in Combined Heat and Power (CHP) projects continued in 2017. The Company incentivized three CHP projects that were installed and also completed commissioning on two CHP projects that were installed in 2016. The Company also conducted several Technical Assistance (TA) Studies in 2017 for projects that may be installed in the future.

Commercial and Industrial Finance

For C&I Finance, please see the section of report that speaks specifically to finance mechanisms and activities.

Small Business Direct Install Program

National Grid's Small Business Direct Install program is a retrofit program that provides turnkey services to customers with less than 200 kW average monthly peak electrical demand. As part of the program, customers receive a free on- site energy assessment and a customized report detailing recommended energy efficient improvements. National Grid then completes retrofit installations at the customer's convenience. In 2017, the program served small businesses of all types including restaurants, non-profits, small offices, and senior care facilities.

National Grid pays up to 70% of installation and equipment costs and customers can finance the remaining share of the project over as many as 60 months (typically 24) on their electric bill, interest free, using the Small Business Revolving Loan Fund, providing that funds are available.

Although the program has traditionally focused on lighting and refrigeration, National Grid is constantly updating the program to apply other measures such as energy management systems, roof-top HVAC unit replacement, and new heating systems. In 2017, controls for both electric and gas measures have gained traction. The program hopes to keep up the momentum in 2018 and beyond.

National Grid has also been actively pursuing new models that serve segments of the small business sector in more tailored and more cost-effective ways through the large C&I programs. The Company's success with schools, national and regional chains, food retailers, and upstream lighting are all signs of a more strategic approach to these customers.

In 2017, National Grid continued to utilize the existing contractor/electrician base through the Customer Directed Option (CDO) where customers are allowed to use their own contractors in conjunction with the expertise of the lead vendor in the Small Business Program. These additional "feet on the street" are helping the program maintain its success even as some segments continue to be successfully served through other paths.

Demonstration Projects

Demand Response Demonstration: The Company's demand response demonstration program for C&I customer's aims to reduce their energy use when the grid is at peak. Over the long term, this will enable National Grid to build a smaller transmission and distribution system, allow ISO-NE to acquire less generation capacity, and reduce customers' third-party supply costs.

The Company and its vendors help customers to identify strategies and technologies that will help customers reduce their energy use at peak times. Through a competitive RFP process the Company has selected three approved curtailment service providers (CSPs) to guide customers through this process. Through another competitive RFP process, the Company has procured a demand response management system (DRMS) to identify when the grid will be at peak, notify vendors and customers of peak events, and measure each customer's reduction in energy use during demand response events.

The program runs every year in June, July, August, and September. The Company can call demand response events on any weekday (except holidays) between the hours of 2-5pm. On average 3-5 demand response events will be called every year. The Company will not call more than 7 events in a single year.

Customers and vendors are paid incentives based on their performance. The vendors and customers split the incentive amounts based on negotiations between the customers in the vendor. However, historically customers have always received the majority of the incentives paid.

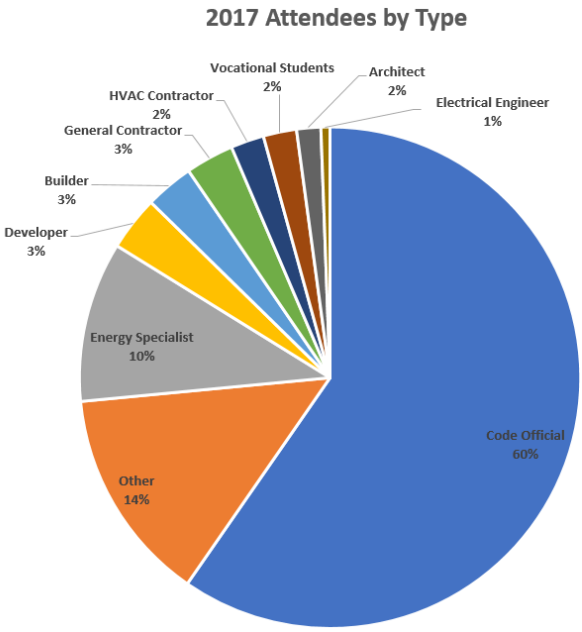
The summer of 2017 was the first time the Company ran its demand response program for C&I customers. During the summer, 32 customers enrolled for a total of 6.7 MW. During events a total average curtailment per event of 10.6 MW was recorded.

Codes and Standards

The Rhode Island Code Compliance Enhancement Initiative (CCEI) is an innovative program that uses targeted stakeholder outreach and direct technical guidance to capture energy savings that would otherwise be lost due to noncompliance with the state's building energy code. It is designed to increase the capability of the building industry as a whole to comply with the residential and commercial building energy code for both new construction and substantial renovations.

2017 marked the fifth year of CCEI and the Company invested considerably in measuring the impact of the initiative thus far and partnering with OER to develop a pair of standards to guide progressive improvement in statewide building practices going forward.

Performance Overview



CCEI delivered a total of 31 CCEI training events in 2017 for 513 total attendees (the majority of which were code officials). This included holding one residential and one commercial classroom training each month as well as seven in-field trainings. With the energy code update planned for 2016 deferred until 2018, these trainings increasingly focused on specific elements with remaining compliance gaps. Another key element of CCEI, the energy code technical support toll-free "circuit rider" service, continued to provide personalized support to building code officials, builders, and design professionals requesting assistance with understanding how the energy code applies to their specific projects. CCEI also continued to build partnerships to expand its reach to new stakeholders through participation at code official meetings and other stakeholder events.

These efforts led to projected residential sector savings of 500 MWh and 6,364 therms and commercial sector savings of 4,768 MWh and 50,000 therms.

Energy Codes

In addition to the CCEI activities discussed above, four individual evaluation studies were completed in 2017 to measure the impact of this this initiative. One of these, the residential baseline study, found that new homes realized 83% of the energy savings available from full compliance with the residential energy code. This is a significant improvement from the previously measured code compliance rate of 58%, especially since the state also adopted a more stringent energy code since that study was conducted. The other three studies involved modeling and projecting the energy savings CCEI will deliver for the 2018-2020 program cycle.

In 2017, the Company also collaborated with OER to finalize voluntary stretch codes customized for the state's commercial and residential buildings. From 2018 onward, CCEI will provide technical guidance for the stretch code similar to that already provided for the regular energy code. The Company will also promote increased use of these stretch codes by empowering community-level support and aligning the stretch codes with the residential and commercial new construction programs as much as possible.

Appliance and Equipment Standards

Beyond supporting energy code compliance, the Company continued to provide technical guidance in developing statewide minimum energy efficiency standards for specific products. In 2017, these efforts

focused on working with a broad range of stakeholders to develop a proposal to establish standards for a package of 20 product types sold in the state. The Company will continue to coordinate with OER and others to identify opportunities to support product standards.

In 2018 and beyond, the Company plans to expand the demonstrated success of its energy code compliance support program to advance the adoption of product standards and energy code enhancements in order to unlock additional opportunities to save additional energy on behalf of customers.

Pilots and Other Initiatives

Residential Demonstration and R&D

Connected Device Demonstration

In 2017, the Company began the second year of a demand response pilot for residential customers called Connected Solutions. At the end of 2016, RI had 333 devices registered in the program. By the end of 2017, there were 930 devices included in the demonstration. For RI, this was a very positive increase in customers participating in the pilot. A contributing factor to the increased participation was the inclusion of NEST thermostats in the Connected Solutions pilot in 2017. NEST did not participate in 2016. An evaluation was conducted in Massachusetts in 2016 and a separate evaluation was conducted in Rhode Island and Massachusetts in 2017 with results still being finalized. Preliminary results show that the demand savings were consistent between the years. Currently there is an average demand savings of 0.5 kW per device during each demand response event.

A study being conducted in Massachusetts is looking at the potential cost effectiveness of other Wi-Fi connected appliances. Preliminary findings indicate that the best cost effectiveness for demand response is found in battery storage and electric resistance water heaters.

Emerging Lighting Controls

The Emerging Lighting Controls demonstration is a joint investigation between RI and MA that is examining how customers interact with communicating lighting control switches and whether there may be savings associated with the technology. Installations of the "smart" lighting systems began in the third quarter of 2017. Each of the 85 participants received a Hub to control the lights, 24 smart lights, six occupancy and light sensors, and four geo-fencing key tags. An example of the equipment and recruitment message is displayed below.

Once all the installations were completed, there were twenty-weeks of participant data collection of normal lighting usage. Customers were not able to

access the smart lighting attributes of their devices and the occupancy sensors were deactivated at this time. Customers were also encouraged to use all their lights as they would normally so an accurate baseline could be established. After the baseline period, customers were randomly selected to receive one of two types of trainings on operating the smart lighting system. Half of the customers received an in-home training and the other half received an on-line training. Once the training was completed, customers were given full access to the smart lighting system and allowed to use the devices as they would like. The occupancy sensors allow for lights to be turned off in the room when a room has been unoccupied for a set period of time. The geo-fencing key tags provide the same service but to all the controllable lights when the home is unoccupied. Another year of data showing customer lighting usage will be captured and analyzed against the initial baseline data. This pilot will conclude at the end of 2018 with results presented in early, 2019.

Initial customer feedback has been very positive. Since the Company selected the technology and had it installed in customer homes, one large barrier in purchasing smart home type products was removed. The initial research involved in finding a hub that would work with all the devices a customer would want to install. Investing in technology that would not become obsolete was removed from the decision making process. Customers seemed excited to have everything installed and working and there were requests for what additional smart devices could be added to the system. The most frequent requests were for security features – motion sensors on doors and windows, or smart locks – and whether Alexa could be connected to the hub.

Communicating Water Heater Controls

The Company investigated retrofit technologies for water heater controls and did not proceed due to the high cost to retrofit a water heater. Enrolling customers that had Wi-Fi enabled water heaters was determined to be much more cost effective. The Company then investigated working with water heater manufacturers to have the manufacturer market to their customers, but manufacturer marketing was not available with some manufacturers. The default registration setting had customers opting in for additional marketing opportunities and there were few customers that selected to opt in to marketing. Another option for enrolling connected water heaters may be feasible in 2018 when the Company investigates whether the new distributed energy resource management system vendor may be able to contact connected water heating customers.

Energy Storage

The Company spoke with several battery storage manufacturers about a RI pilot which resulted in the Company deciding not to proceed with this demonstration. Two manufacturers were not supportive of a demonstration of this size, approximately 10 units, and felt they had much larger deployments in other areas that were a better investment of their time. One manufacturer was interested in a pilot, but due to the technology of their battery, lead-acid battery, the decision was made that the Company could monitor efforts of larger deployments in other territories while reconsidering a battery storage pilot design.

Zero Energy Homes

National Grid, RI Office of Energy Resources (OER) and RI Housing (RIH), ("Program Partners") worked collaboratively on the development of a request for proposal (RFP) and memorandum of understanding (MOU) for the Zero Energy for the Ocean State Pilot Program ("ZEOS Program"). The ZEOS Pilot Program is intended to help foster growth of zero energy buildings (ZEBs) in Rhode Island. The Pilot Project may include one or more projects. The Program Partners will seek proposals from qualified Project Teams to design and construct affordable energy efficient ZEBs to serve low- and moderate-income residents in Rhode Island. The housing units must employ high energy efficiency design, high efficiency mechanical systems and appliances, solar PV and air-source heat pump technologies to achieve ZEB status. The units may be new construction and/or renovation projects. The ZEOS Program did not proceed due to delay in RFP and subsequent staffing changes at RIH. This Program, or another zero energy residential project, will be developed in 2018.

Demonstration	Goals	2017 Findings	Budget Spent
Connected Device Demonstration	• Increase customer participation in Connected Solutions • Determine savings for program • Cost effectively reduce peak demand in the residential sector	• Dramatic increase in customer participation • Evaluated per device savings consistent over two years • Dramatic decrease in program costs to achieve cost effectiveness	$434,536.02 [$248,600 budgeted]
Emerging Lighting Controls	• Customer total electric bill savings • Customer satisfaction of communicating appliances • Customer assessment of technology benefits • Customer experience of program • Likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders	• Customers very excited about smart home features • Having a set technology package and removing the research and decision making process involved in finding a system seemed to be a relief for some home owners • Customers interested in adding more smart home functionality	$168,160 [$170,000 budgeted]
Communicating Water Heater Controls	• Customer total bill savings for gas and electric bills as applicable • Demand response load curtailment • Customer satisfaction of communicating appliances • Customer assessment of technology benefits • Customer experience of	• Did not proceed. Determined that retrofit controls were not as compelling as new water heaters with controller already incorporated with the device.	[$127,350 budgeted]

	program • Likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders		
Energy Storage	• Demand response load relief • Customer load shifting • reliability • Customer assessment of technology benefits • Customer experience of program • Likelihood of a customer recommending participation in a similar program to fellow Rhode Islanders	• Did not proceed. • Manufacturers were not interested in a pilot this size.	[$125,000 budgeted]
Zero Energy Homes	• Issue and award an RFP for a low/moderate customer residential zero energy project. • Create collaborative project goals including energy efficiency, installation of solar, and low/moderate income property to meet National Grid, OER and RIH respective organizational goals	• Developed an RFP and MOU in collaboration with OER and RIH to pursue the development of a low/moderate income zero energy residential project. • Project did not proceed due to delay in RFP and subsequent staffing changes at RIH. • This project, or another zero energy residential project, will be launched in 2018.	[$150,000 budgeted]

SolarWise

Based on assessments of the program, the Company proposed in PUC Docket No. 4672 to replace the SolarWise program with a new streamlined Solar Marketplace and marketing campaign designed to support the original goals of promoting energy efficiency (EE) and solar to all customers in Rhode Island. Specifically, these changes include the following:

- Discontinue offering in-person discussion of solar during EE home energy assessments.
- Discontinue the SolarWise Bonus availability as of October 15, 2017.
- Discontinue at that time the special "resizing" requirement associated with the estimated savings from EE to qualify for the Bonus, since the Bonus will be no longer be

available. The Company will continue to rely on the existing statutory size limit for solar PV (100% of annual usage, based on 3-year average).

- Rename the SolarWise Marketplace the "RE Growth Solar Marketplace."

Customers meeting the requirements for the SolarWise Bonus by October 15, 2017 were eligible to receive their bonus level incentive for the term of their enrollment. The PUC agreed that SolarWise and bonus incentives will end October 15, 2017.

System Reliability Procurement

In System Reliability Procurement (SRP), the Company develops and implements non-wires alternative projects (NWAs). This involves identifying transmission or distribution needs that have the potential to be deferred by distributed energy resources within a specified timeline. These projects are customer-focused and can include some measures that are also offered through the Company's statewide energy efficiency programs.

Program year 2017 marked the last year of the Demandlink™ pilot in Tiverton and Little Compton[11]. Launched in 2012, the pilot's primary objective is to implement a combination of energy efficiency and demand response measures in customer homes and businesses in order to reduce 1 MW of load on the affected feeders by the end of 2017. In 2017, the Company maintained the same portfolio of incentives as the previous year, hoping to continue the rate of recruitment. The Company also continued to leverage its statewide EnergyWise and Small Business Direct Install programs in the promotion and delivery of these measures. Between June and September 2017, fifteen demand response events were conducted. A final evaluation is being conducted in 2018 to report out on the final impacts from this pilot.

The new NWA project proposed in the 2018 SRP Plan is the Little Compton Battery Storage Project. This project includes a battery storage system that will be installed in Little Compton, RI that is capable of providing 1 MWh of energy storage at a level of 250 kW of continuous peak load relief in the areas of Tiverton and Little Compton between the hours of 3:30pm and 7:30pm during the months of June through September. This project will further defer the $2.9 Million substation upgrade in this area.

In 2018, the SRP program is also focusing on the creation of the Rhode Island System Data Portal (Portal) and associated marketing and engagement plan. The Data Portal will provide information on parts of the electric system that are heavily loaded and could benefit from the installation of technologies that can reduce demand as well as areas where there is plenty of capacity that may be better suited for electric heat and electric vehicles. The Portal will also include an initial version of a distributed generation (DG)-focused map that identifies substations that are either DG-ready or in need of upgrades before DG can be installed. Together, these efforts will promote the Portal to potential distributed energy resource (DER) solution providers. This effort would aim to increase industry knowledge of the Portal and incentives available through existing Company and state programs for conservation, peak load relief, and renewable energy projects in highly-utilized areas.

[11] The DemandLink pilot's goal is to reduce peak load on feeders 33F3 and 33F4. These feeders serve the entire town of Little Compton and all but the northwest corner of Tiverton.

Additional SRP details on 2017 activities and 2018 plans can be found in the Company's 2018 SRP Report filed in Docket 4756 and approved by the PUC on December 20, 2017. The final evaluation report for the Demandlink™ pilot in Tiverton and Little Compton will be completed in June 2018 and will be filed with the 2019 SRP Report.

Financing

In 2017, the Company offered a variety of finance options to both commercial and residential customers. Since 2011, the Company has managed several revolving loan funds that allow customers to pay for their portion of an energy efficiency project through their monthly bills. The funds allowed most participants to remain cash-flow positive and helped relieve pressure on the DSM charge by reducing incentive budgets. In 2014, the Company began managing a revolving loan fund for state and municipal customers as part of the RI Public Energy Partnership (RI PEP). Those efforts and financial resources associated with them have been largely redirected into the Efficient Buildings Fund (EBF). In 2015, the Company extended opportunities for gas projects through the Large Commercial & Industrial (LC&I) gas revolving loan fund.

Large C&I Revolving Loan Fund

Through the electric LC&I revolving loan fund, the Company offered $10.9 million in on-bill financing to 122 Large Commercial customers through 282 loans resulting in electric savings of 21,586 annual MWh and 255,407 lifetime MWh. At the end of 2017, the fund had a balance of $9.3 million, money that will be available for more loans in 2018.

In 2017, National Grid also worked extensively with its sales people and several of its vendors to determine the future potential for On-Bill Repayment (OBR) and to understand the future role of OBR in the Company's program offerings. The Company found that demand for OBR was much greater than it had previously estimated and that nearly all participating customers appreciated its unique attributes. The Company presented these findings in front of the PUC in a Technical Session, to the Energy Efficiency Resource Management Council (EERMC), and to the Collaborative.

The Company worked closely with an evaluation contractor to determine the timing and necessity of injections into the OBR fund in the 2018-2020 three year plan as well as the 2018 Energy Efficiency Plan. In 2017, the Company continued to investigate changes to OBR as recommended by Dunsky Energy Consulting, a consultant to the EERMC. These recommendations combined with the Company's own research will result in one or more pilots in 2018.

Through the Gas LC&I revolving loan fund, the Company offered $680,811 in loans to 29 Large Commercial customers resulting in gas savings of 36,499 annual MMBtu and 333,999 lifetime MMBtu. At the end of 2017, the fund had a balance of $2.0 million that will be available for more loans in 2018 and in the future.

The Company continued to manage a revolving loan fund in support of the RI PEP. The Company offered $18,003 in on-bill finance to 1 participating municipal customer. This resulted in an electric savings of 15 annual MWh. At the end of 2017, the fund had a balance of $805,153. In March 2018, $700,000 from

this fund was paid to the RI Office of Energy Resources in accordance with the 2017-B Final Plan for the Allocation and Distribution of Regional Greenhouse Gas Initiative Auction Proceeds.

Small Business Revolving Loan Fund

In 2017, 1,911 customers participated in the Small Business Direct Install program. They each received an incentive of ~70% of total project costs and made a choice to either finance the remaining 30% share of the project costs at 24 months at zero (0) percent interest or receive a 15% discount if they used another source of funding. Overall, the Small Business Revolving Loan fund was able to provide $3.1 million in loans that led to more than 12,956 MWh in annual energy savings. At year end, the fund had a balance of $1.9 million.

Efficient Buildings Fund (EBF): Since 2015, National Grid, the Rhode Island Office of Energy Resources (OER), and the Rhode Island Infrastructure Bank (RIIB) have been working together to leverage system benefit charge (SBC) funds and drive energy improvements in facilities in cities and towns across Rhode Island.

The seed money to support this unique revolving loan fund came from a $1.8 million allocation of rate-payer (SBC) funds, mandated by the law, and $3.0 million in funds from the Regional Greenhouse Gas Initiative (RGGI) overseen by OER. In addition, National Grid, based a requests from RIIB, and working in conjunction with the Collaborative each program year, agreed to transfer $5 million in energy efficiency program funds to RIIB in 2017 and in 2018. Both of these transfers were included in their respective Energy Efficiency Plan and related budgets.

Demand for the first round was very strong. Subsequent rounds have had varying levels of success. However, this was not due to lack of need or cost effective options. In 2016, the Rhode Island Department of Education (RIDE), with its partner Jacobs Engineering, conducted audits for 307 public schools in the state and found significant amounts of energy efficiency improvements that could be made with current technology. National Grid and its partners believe that many schools hesitated to act due to a legal incompatibility between EBF and RI School Housing Aid. If this barrier is removed and RI School Housing Aid budgets are strong in subsequent fiscal years, National Grid and its partners believe this sector has significant potential for savings.

Commercial Property Assessed Clean Energy (C-PACE): National Grid continued to work with RIIB and its program administrator, Sustainable Real Estate Solutions (SRS), to advance the concept of C-PACE in the market. In 2017, the main focus was on long term care facilities. While this sector was less fruitful than was expected, all parties learned from this experience and are prepared to bring these lessons into 2018.

The Company also worked with RIIB and SRS to understand how C-PACE could be applied to the new construction market in Rhode Island. National Grid believes one key to unlocking the potential in this area is to increase market awareness among local/regional developers and architecture firms.

Ascentium: In the fourth quarter, National Grid began working with Ascentium Capital, a specialty financing firm who is a leader in equipment and technology financing solutions, to offer customers another way to finance their projects. A simple, rapid approval loan process allows customers to use

their incentive to buy down interest on loans (typically to zero percent depending on the term) for up to $250,000. The Company will continue to offer and examine this option in 2018.

Other commercial financial developments

National Grid is committed to making sure that customers have a robust selection of financial mechanisms that have proven themselves successful in other programs across the United States and Canada. To this end, National Grid began creating a financial mechanisms inventory in 2017. This inventory contains the mechanisms above as well as other concepts that need to be explored in 2018 to make sure that they are appropriate for and can be successfully deployed in the Rhode Island market.

The Company also began to explore how these mechanisms can be best presented to customers so they know which option is best for them. This work will continue in 2018.

Heat Loan

The Company also continued offering a 0% interest Heat Loan to residential customers to finance their portions of residential energy efficiency projects.

In 2017, there were six lenders participating in the initiative: Greenwood Credit Union, Coventry Credit Union, Bay Coast Bank, Navigant Credit Union, the Capital Good Fund, and Bank Five. The Heat Loan can be used for Insulation and/or Air Sealing Upgrades, Energy Efficient Heating System Replacements, Duct Sealing and Duct Insulation, Energy Efficient Domestic Hot Water Systems, or ENERGY STAR® Thermostats. Depending on the lender, customers are eligible to receive 0% interest loans up to $25,000 for period of up to 7 years. In total, 720 Heat Loans were secured, valued at approximately $4.3 million. An overview of the revolving loan funds and Heat Loan for 2017 is included in tables E-6 and E-7.

Rhode Island Comprehensive Marketing

In 2017, National Grid continued to increase awareness of Energy Efficiency programs for Rhode Island residential and commercial customers through a comprehensive campaign. The campaign communicated the ways in which Energy Efficiency improves the life or business of customers. By leveraging internal and external customer research, and focusing on non-energy benefits, the Company reached customers with targeted messages that resonated with what matters most to them. Mass media tactics included broadcast and cable television, pre-roll video, broadcast radio, streaming radio, local newspaper, native advertising, and social media. According to market research studies conducted throughout the year, Rhode Island customers consistently score higher in terms of familiarity with National Grid's Energy Efficiency programs than in other jurisdictions.

Jobs Impacts

National Grid hired Peregrine Energy Group, Inc. to conduct a study of the job impacts from National Grid's energy efficiency programs in 2017. The study estimates the number of full-time equivalent (FTE) employees engaged in all aspects of energy efficiency programs where National Grid provided funding support in 2017. The FTE counts cover a wide range of energy efficiency services, including independent contractors and plumbers, rebate processers, engineers, and National Grid Staff. The study also includes

counts of Weatherization Assistance Program (WAP) FTEs that are employed by the Community Action Program agencies that deliver low-income energy efficiency services.

Peregrine determined that 726 full-time equivalent (FTE) employees had work in 2017 as a result of investments by National Grid in energy efficiency programs provided to its Rhode Island electricity and natural gas customers. Most of the jobs created as a result of energy efficiency investments were local because they were tied to installation of equipment and other materials.

The study identified 917 companies and agencies involved in National Grid's 2017 energy efficiency programs, 79% of which were located in Rhode Island. The companies identified include those whose employees are counted in the FTE analysis, as well as additional companies who assisted customers to secure equipment rebates, for example through the New Construction, Commercial Upstream Lighting, or High Efficiency HVAC programs.

Full-Time Equivalent (FTE) Employment Supported by Energy Efficiency Programs in Rhode Island in 2017

Programs	**Total FTEs**
Electric Programs	
Commercial and Industrial	263.5
Residential Income Eligible	46.0
Residential Non-Income Eligible	98.2
Gas Programs	
Commercial and Industrial	34.4
Residential Income Eligible	36.5
Residential Non-Income Eligible	174.7
National Grid EE Staffing	38.2
Community Action Agency staff	35.0
Total all 2017 Rhode Island FTEs	726.4

The study's findings were developed through interviews with energy services and equipment vendors and National Grid contractors, as well as through a detailed review of National Grid's records of all energy efficiency measures installed in homes, apartment buildings, businesses, and industries throughout the state in 2017. Peregrine Energy Group calculated the labor hours required for each installation based on industry standards and discussions with contractor experts.

One FTE equals 1,760 work hours, or the total of one person working 8 hours a day for 220 work days in an average year. Because a "full-time equivalent" employee often represents the labors of more than one person over the course of a year, the number of individual workers employed as result of Rhode

Island energy efficiency programs funded by National Grid is far larger than the total of FTEs. The study and a complete list of businesses are included as Attachment 5.

Shareholder Incentive

The Company's Shareholder Incentive earnings are determined by its performance against the established annual savings goals documented in the 2017 EEPP. Under the current incentive structure, the Company can earn a target based-incentive rate equal to 5.0% of the eligible spending budget in a program year for achieving electric and gas energy savings goals.

Beginning in 2015, the incentive structure was changed for the electric portfolio to promote both energy and demand savings. This structure allows the Company to earn a target-based incentive rate equal to 3.5% of the eligible annual spending budget for achieving MWh savings goals and 1.5% of the annual spending budget for achieving MW savings goals.

For the gas portfolio, where there is no demand savings component, the original target-based incentive rate equal to 5.0% of the eligible annual spending budget for achieving MMBtu savings goals remained in place.

The Shareholder Incentive is earned by sector. An incentive is earned if savings in a sector are between 75% and 125% of the savings goal for the sector. An enhanced incentive up to 125% of the target incentive is available for achieving greater savings than the savings target. All sectors earned an incentive for their 2017 performance. All gas sectors earned over 100% of the target incentive. For electric MWh, all sectors earned over 100% of the target incentive, and for the electric MW, income-eligible and residential earned over 100% of the target.

The Company has earned a total of $6,463,378 for the successful implementation of its energy efficiency programs in 2017.

More details on the Company's Shareholder Incentive achievements are included in Attachments 1 and 2 and tables E-4 and G-4.

Attachment 1
Electric Year-End Results

Attachment 1

Electric Summary Tables of Year-End Results

NATIONAL GRID ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-1: Summary of 2017 Target and Year End Results

Sector and Program	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Demand Reduction (Annual kW)			Energy Savings (Annual MWh)			Customer Participation			Implementation Expenses ($ 000)				
Commercial & Industrial	**Target**	**Actual**	**Pct Achieved**	**Target**	**Actual**	**Pct Achieved**	**Approved Target**	**Actual**	**Pct Achieved**	**Budget**	**Actual**	**Pct Achieved**	**Lifetime MWh**	**$/kWh**
Large Commercial New Construction	1,276	1,582	123.9%	14,270	13,141	92.1%	201	144	71.8%	$5,121.4	$5,183.2	101.2%	224,195	$0.023
Large Commercial Retrofit	13,317	11,973	89.9%	77,611	89,378	115.2%	2,188	2,416	110.4%	$22,708.4	$24,964.6	109.9%	1,124,598	$0.022
Small Business Direct Install	2,815	1,860	66.1%	12,136	12,956	106.8%	744	666	89.6%	$8,431.4	$8,184.6	97.1%	158,975	$0.051
Commercial Demonstration and R&D										$874.4	$298.6	34.1%		
RI Infrastructure Bank										$4,900.0	$4,900.0	100.0%		
Finance Costs										$4,500.0	N/A	N/A		
SUBTOTAL	**17,409**	**15,414**	**88.5%**	**104,017**	**115,476**	**111.0%**	**3,133**	**3,227**	**103.0%**	**$46,535.6**	**$43,531.0**	**93.5%**	**1,507,768**	**$0.029**
Subtotal with Finance										*$46,535.6*	*$48,031.0*	*103.2%*	*1,507,768*	*$0.032*
Income Eligible Residential														
Single Family - Income Eligible Services	652	825	126.6%	4,350	4,050	93.1%	2,625	3,074	117.1%	$9,268.1	$8,210.7	88.6%	47,332	$0.173
Income Eligible Multifamily	145	195	134.6%	2,726	3,970	145.6%	2,894	5,162	178.4%	$2,708.4	$2,858.6	105.5%	28,814	$0.099
SUBTOTAL	**797**	**1,020**	**128.1%**	**7,076**	**8,020**	**113.3%**	**5,519**	**8,236**	**149.2%**	**$11,976.5**	**$11,069.3**	**92.4%**	**76,147**	**$0.145**
Non-Income Eligible Residential														
Residential New Construction	54	128	238.2%	1,065	1,390	130.5%	561	680	121.2%	$1,045.3	$1,142.2	109.3%	23,440	$0.049
ENERGY STAR® HVAC	330	785	237.6%	1,376	1,642	119.3%	1,900	2,699	142.1%	$1,669.5	$1,587.1	95.1%	22,613	$0.070
EnergyWise	376	385	102.6%	6,545	6,892	105.3%	9,000	10,159	112.9%	$9,630.0	$9,371.2	97.3%	66,123	$0.142
EnergyWise Multifamily	288	203	70.4%	3,519	2,670	75.9%	4,000	3,557	88.9%	$3,443.5	$2,039.1	59.2%	26,887	$0.076
Home Energy Reports	3,119	3,557	114.0%	26,184	30,451	116.3%	208,063	208,427	100.2%	$2,447.0	$2,389.8	97.7%	30,451	$0.078
ENERGY STAR® Lighting	5,466	7,115	130.2%	46,856	60,993	130.2%	279,425	435,656	155.9%	$7,612.4	$8,965.9	117.8%	540,707	$0.017
Residential Consumer Products	705	756	107.4%	4,708	4,491	95.4%	14,700	14,502	98.7%	$2,125.0	$2,307.4	108.6%	33,780	$0.068
Energy Efficiency Education Programs										$40.0	$49.8	124.5%		
Residential Demonstration and R&D										$1,179.5	$719.0	61.0%		
Community Based Initiatives - Residential										$270.8	$199.7	73.7%		
Comprehensive Marketing - Residential										$535.4	$476.7	89.0%		
SUBTOTAL	**10,337**	**12,929**	**125.1%**	**90,254**	**108,528**	**120.2%**	**517,648**	**675,678**	**130.5%**	**$29,998.4**	**$29,247.9**	**97.5%**	**744,001**	**$0.039**
Regulatory														
OER										$816.3	$847.3	103.8%		
EERMC										$816.3	$816.2	100.0%		
SUBTOTAL										**1,632.5**	**1,663.5**	**101.9%**		
TOTAL	**28,543**	**29,363**	**102.9%**	**201,347**	**232,023**	**115.2%**	**526,299**	**687,141**	**130.6%**	**$90,143.1**	**$85,511.7**	**94.9%**	**2,327,916**	**$0.037**
TOTAL With Finance										***$90,143.1***	***$90,011.7***	***99.9%***	***2,327,916***	***$0.039***
RGGI										*$767.8*	$23.0	*3.0%*		
Municipal LED Street Lights										*$1,525.0*	$722.7	*47.4%*		
System Reliability Procurement										*$399.3*	$229.6	*57.5%*		

NOTES

(1)(4)(7) Targets from Docket 4654 - Attachment 5, Table E-7 (electric)

(3) Pct Achieved is Column (2)/ Column (1).

(6) Pct Achieved is Column (5)/ Column (4).

(8) Participation was planned and is reported in 'net' terms which takes into account free-ridership and spillover.

Beginning in 2017, Home Energy Reports participation was counted as the number of customers receiving reports (i.e., the “treatment group”) adjusted by the “Read Rate” of 75% from the most recent Customer Engagement Tracker Survey.

(9) Pct Achieved is Column (8)/ Column (7).

(10) Approved Budget includes Implementation and Evaluation budgets from Docket 4654, Attachment 5 Table E-2 (electric), adjusted to reflect the following transfers made during the 3rd Quarter pursuant to Sections IV.C.1.A of the Energy Efficiency Program Plan for 2017 Settlement of the Parties (2017 Plan) approved in Docket 4654: $1,000,000 from Large Commercial Retrofit to Commercial Finance Costs and $200,000 from Small Business Direct Install to Commercial Finance Costs. Implementation and Evaluation budgets from Docket 4654, Attachment 5 Table E-2 (electric), were adjusted to reflect the following transfers made during the 4th Quarter pursuant to Sections IV.C.1.A and IV.C.2 of the Energy Efficiency Program Plan for 2017 Settlement of the Parties (2017 Plan) approved in Docket 4654: $1,800,000 from ENERGY STAR® Lighting to Commercial Finance Costs and $200,000 from Small Business Direct Install to Commercial Finance Costs.

(11) Year To Date Expenses.

RGGI Expenses are counted separate as those funds were not part of the approved 2017 budget. Details on RGGI spend are found in Attachment 6: 2017 RGGI Auction Proceeds.

The Company received $1,525,000 from the State for municipal street lights to pay out to municipal customers on its behalf.

System Reliability Procurement targets from Docket 4654 - Attachment 5, Table E-7 (electric), not included in Expenses Total

(12) Pct Achieved is Column (11)/ Column (10).

(14) $/lifetime kWh = Column (11)/Column (13)

(13) Planned $/lifetime kWh - Attachment 5, Table E-5 (electric)

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-2: Summary of Value, kW, and kWh by Program
2017 Program Year

	Value (000's)												kW Saved				MWh Saved		MMBtu of Oil	
		Capacity					Energy					Non-Electric Benefits	Maximum Annual							
		Generation					Winter		Summer											
Commercial & Industrial	**Total**	**Summer**	**Winter**	**Trans**	**MDC**	**DRIPE**	**On Peak**	**Off Peak**	**On Peak**	**Off Peak**	**DRIPE**			**Winter**	**Summer**	**Lifetime**	**Annual**	**Lifetime**	**Annual**	**Lifetime**
Large Commercial New Construction	$24,120	$4,323	$0	$292	$2,144	$0	$8,433	$3,689	$4,175	$1,544	$38	($518)	1,500	875	1,582	24,281	13,141	224,195		
Large Commercial Retrofit	$100,016	$23,979	$0	$1,681	$12,335	$0	$26,208	$21,618	$12,287	$8,924	$220	($7,235)	10,669	11,549	11,973	127,778	89,378	1,124,598		
Small Business Direct Install	$16,304	$2,118	$0	$916	$3,931	$0	$4,063	$2,696	$1,954	$1,198	$31	($603)	1,860	2,021	1,860	22,584	12,956	158,975		
SUBTOTAL	**$140,440**	**$30,420**	**$0**	**$2,890**	**$18,409**	**$0**	**$38,704**	**$28,003**	**$18,416**	**$11,666**	**$288**	**($8,356)**	**14,029**	**14,445**	**15,414**	**174,643**	**115,476**	**1,507,768**		
Income Eligible Residential																				
Single Family - Income Eligible Services	$26,216	$1,505	$0	$107	$784	$0	$1,400	$1,046	$660	$389	$11	$20,315	825	731	825	9,183	4,050	47,332	15,496	299,061
Income Eligible Multifamily	$6,691	$240	$0	$18	$132	$0	$778	$685	$290	$230	$10	$4,310	194	570	195	1,531	3,970	28,814	536	7,575
SUBTOTAL	**$32,907**	**$1,745**	**$0**	**$125**	**$916**	**$0**	**$2,178**	**$1,731**	**$950**	**$618**	**$21**	**$24,624**	**1,019**	**1,301**	**1,020**	**10,714**	**8,020**	**76,147**	**16,032**	**306,636**
Non-Income Eligible Residential																				
Residential New Construction	$2,693	$443	$0	$29	$215	$0	$711	$850	$213	$136	$3	$92	128	66	128	2,576	1,390	23,440	138	3,435
ENERGY STAR® HVAC	$7,329	$1,753	$0	$120	$878	$0	$480	$593	$412	$186	$5	$2,903	785	996	785	10,347	1,642	22,613	1,162	51,733
EnergyWise	$12,959	$524	$0	$39	$285	$0	$1,960	$1,275	$908	$528	$19	$7,421	385	1,280	385	3,317	6,892	66,123	10,598	210,172
EnergyWise Multifamily	$5,740	$333	$0	$24	$176	$0	$823	$652	$268	$180	$6	$3,276	203	552	203	2,057	2,670	26,887	4,037	34,973
Home Energy Reports	$2,973	$378	$0	$42	$312	$0	$904	$728	$314	$234	$61	$0	3,557	4,872	3,557	3,557	30,451	30,451		
ENERGY STAR® Lighting	$41,097	$10,013	$0	$739	$5,422	$0	$17,504	$8,746	$7,887	$3,558	$170	($12,942)	7,115	9,148	7,115	63,095	60,993	540,707		
Residential Consumer Products	$3,848	$911	$0	$69	$506	$0	$691	$635	$505	$399	$12	$120	756	600	756	5,870	4,491	33,780	411	2,877
SUBTOTAL	**$76,639**	**$14,355**	**$0**	**$1,062**	**$7,794**	**$0**	**$23,073**	**$13,480**	**$10,508**	**$5,222**	**$275**	**$869**	**12,929**	**17,514**	**12,929**	**90,818**	**108,528**	**744,001**	**16,346**	**303,190**
TOTAL	**$249,986**	**$46,520**	**$0**	**$4,077**	**$27,119**	**$0**	**$63,955**	**$43,214**	**$29,874**	**$17,506**	**$584**	**$17,138**	**27,977**	**33,260**	**29,363**	**276,175**	**232,023**	**2,327,916**	**32,378**	**609,826**

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-3: Summary of B/C Ratios, Value and Costs ($000's)
2017 Program Year

Commercial & Industrial	(1) Benefit/ Cost	(2) Total Value	(3) Program Implementation Expenses	(4) Customer Contribution	(5) Shareholder Incentive
Large Commercial New Construction	4.15	$24,119.5	$5,183.2	$629.7	
Large Commercial Retrofit	2.26	$100,016.4	$24,964.6	$19,329.1	
Small Business Direct Install	1.47	$16,304.2	$8,184.6	$2,870.6	
Commercial Demonstration and R&D			$298.6		
RI Infrastructure Bank			$4,900.0		
Finance Costs			$4,500.0		
SUBTOTAL	**1.92**	**$140,440.1**	**$48,031.0**	**$22,829.5**	**$2,266.3**
Income Eligible Residential					
Single Family - Income Eligible Services	3.19	$26,216.0	$8,210.7	$0.0	
Income Eligible Multifamily	2.34	$6,691.4	$2,858.6	$0.0	
SUBTOTAL	**2.79**	**$32,907.4**	**$11,069.3**	**$0.0**	**$738.6**
Non-Income Eligible Residential					
Residential New Construction	2.26	$2,692.9	$1,142.2	$48.7	
ENERGY STAR® HVAC	3.14	$7,328.5	$1,587.1	$748.8	
EnergyWise	1.04	$12,959.2	$9,371.2	$3,110.8	
EnergyWise Multifamily	2.57	$5,739.9	$2,039.1	$194.2	
Home Energy Reports	1.24	$2,973.5	$2,389.8	$0.0	
ENERGY STAR® Lighting	2.37	$41,096.9	$8,965.9	$8,346.3	
Residential Consumer Products	1.24	$3,847.7	$2,307.4	$805.3	
Energy Efficiency Education Programs			$49.8		
Residential Demonstration and R&D			$719.0		
Community Based Initiatives - Residential			$199.7		
Comprehensive Marketing - Residential			$476.7		
SUBTOTAL	**1.73**	**$76,638.7**	**$29,247.9**	**$13,254.1**	**$1,825.0**
Regulatory					
OER			$847.3		
EERMC			$816.2		
SUBTOTAL			**$1,663.5**		
TOTAL	**1.91**	**$249,986.2**	**$90,011.7**	**$36,083.6**	**$4,829.8**

Notes:

(1) RI Total Resource Cost test Benefit/Cost Ratio = Total Value/(Program Implementation Expenses + Customer Contribution + Shareholder Incentives).

(2) Year-End Value Total from Table E-2.

(3) Year-End Implementation Expenses by Program from Table E-1 including payments to RIIB and Finance Costs.

(4) Shareholder incentives from Table E-4.

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-4: National Grid 2017 EE Incentive Calculation

Energy Incentive Rate:	**3.50%**						
Sector	(1) **Approved Spending Budget**	(2) **Target Incentive**	(3) **Annual kWh Savings Goal**	(3a) **Actual Spending**	(3b) **% of Approved Spending**	(3c) **Budget adjusted target kWh savings**	(4) **Threshold kWh Savings**
Income Eligible Residential	$11,976,528	$419,178	7,076,222	$ 11,069,298	92.4%	6,540,193	4,905,145
Non-Income Eligible Residential	$29,998,435	$1,049,945	90,253,592	$ 29,247,931	97.5%	90,253,592	67,690,194
Commercial & Industrial	$46,535,591	$1,628,746	104,016,753	$ 48,031,007	103.2%	104,016,753	78,012,564
Total	**$88,510,555**	**$3,097,869**	**201,346,566**	**$ 88,348,235**		**200,810,537**	**150,607,903**

Sector	(5) **Actual kWh**	(6) **% of Target Savings**	(7) **Savings Eligible for Incentive**	(8) **Total Earned Incentive**	(9) **% of Target Incentive Achieved**
Income Eligible Residential	8,019,960	122.6%	8,019,960	$ 514,021	122.6%
Non-Income Eligible Residential	108,527,597	120.2%	108,527,597	$ 1,262,532	120.2%
Commercial & Industrial	115,475,893	111.0%	115,475,893	$ 1,808,179	111.0%
Total	**232,023,450**	**115.5%**	**232,023,450**	**$ 3,584,731**	**115.7%**

Demand Incentive Rate:	**1.50%**						
Sector	(1) **Approved Spending Budget**	(2) **Target Incentive**	(3) **Annual kW Savings Goal**	(3a) **Actual Spending**	(3b) **% of Approved Spending**	(3c) **Budget adjusted target kW savings**	(4) **Threshold kW Savings**
Income Eligible Residential	$11,976,528	$179,648	797	$ 11,069,298	92.4%	736	552
Non-Income Eligible Residential	$29,998,435	$449,977	10,337	$ 29,247,931	97.5%	10,337	7,753
Commercial & Industrial	$46,535,591	$698,034	17,409	$ 48,031,007	103.2%	17,409	13,057
Total	**$88,510,555**	**$1,327,658**	**28,543**	**$ 88,348,235**		**28,483**	**21,362**

Sector	(5) **Actual kW**	(6) **% of Target Savings**	(7) **Savings Eligible for Incentive**	(8) **Total Earned Incentive**	(9) **% of Target Incentive Achieved**
Income Eligible Residential	1,020	138.6%	920	$ 224,560	125.0%
Non-Income Eligible Residential	12,929	125.1%	12,922	$ 562,471	125.0%
Commercial & Industrial	15,414	88.5%	15,414	$ 458,085	65.6%
Total	**29,363**	**103.1%**	**29,256**	**$ 1,245,116**	**93.8%**

Notes

(1) Budget from 2017 EEPP. Includes Implementation; excludes Regulatory Costs, and Shareholder Incentive.

(2) Equal to the incentive rate (3.5% for Energy, 1.5% for Demand) x Column (1)

(3) Approved savings goal from 2017 EEPP

(3a) Actual spending includes actual Implementation Expenses from Table E-1. It excludes excludes Regulatory Costs, and Shareholder Incentive.

(3b) Column (3a)/ Column (1)

(3c) Column (3) * (3b), only if 100% of Target Savings were achieved in Column (3)

(4) 75% of Target kWh Savings

(5) Year End Savings from Table E-1

(6) Column (6)/ Column (3c)

(7) If Column (7) is less than 75%, Column (8) = 0,
If Column (7) is between 75% and 125%, Column (8) = Column 6;
If Column (7) is greater than 125%, Column (8) = 125% of Column (3c) due to the incentive cap.

(8) The shareholder is calculated as follow, where SB is the Spending Budget in the sector:
From 75% of savings to 100% of savings: Shareholder Incentive = SB x (0.15 x % of savings achieved – 0.10)
x 0.7 for energy savings
x 0.3 of demand savings
From 100% of savings to 125% of savings: Shareholder Incentive = SB x (0.05 x % of savings achieved)

(9) Column (9) / Column (2)

National Grid: NECO

TABLE E-5

OVERALL ANALYSIS OF ELECTRIC ENERGY EFFICIENCY FUND BALANCE

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	TOTAL
1. Start Of Period Balance	$11,688,629	$14,580,188	$17,416,965	$19,289,075	$20,497,186	$20,832,746	$11,688,629
2. Revenue	$7,287,567	$6,484,329	$6,924,572	$6,271,182	$6,444,518	$7,133,934	$40,546,102
3. Monthly EE Expenses	$4,419,410	$3,676,057	$5,080,581	$5,093,551	$6,140,620	$8,251,501	$32,661,721
4. Cash Flow Over/(Under)	$2,868,157	$2,808,271	$1,843,991	$1,177,631	$303,898	($1,117,567)	$7,884,381
5. End Of Period Balance Before Interest	$14,556,786	$17,388,459	$19,260,956	$20,466,706	$20,801,084	$19,715,179	$19,573,010
6. Interest	$23,402	$28,505	$28,120	$30,479	$31,662	$31,087	$173,255
7. End Of Period Balance After Interest	$14,580,188	$17,416,965	$19,289,075	$20,497,186	$20,832,746	$19,746,265	$19,746,265

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR END TOTAL
8. Start Of Period Balance	$19,746,265	$24,523,146	$27,049,068	$27,689,266	$20,309,059	$20,594,301	$11,688,629
9. Revenue [19]	$9,569,231	$9,496,998	$6,996,563	$5,573,785	$7,801,717	$8,445,652	$88,430,050
10. Monthly EE Expenses	$4,826,264	$7,010,586	$6,398,299	$12,990,763	$7,547,810	$14,822,014	$86,257,456
11. Cash Flow Over/(Under)	$4,742,967	$2,486,413	$598,264	($7,416,977)	$253,907	($6,376,361)	$2,172,593
12. End Of Period Balance Before Interest	$24,489,232	$27,009,559	$27,647,332	$20,272,288	$20,562,966	$14,217,940	$13,861,223
13. Interest	$33,914	$39,508	$41,934	$36,771	$31,335	$26,689	$383,407
14. End Of Period Balance After Interest	$24,523,146	$27,049,068	$27,689,266	$20,309,059	$20,594,301	$14,244,629	**$14,244,629**
15. 2017 Incentive							**$4,829,847**
16. Ending Balance after Incentive							**$9,414,783**

Notes

1. Previous year's ending balance
2. Business Objects queries for revenues
3. SAP queries for expenses
4. Line 2 minus Line 3
5. Line 1 plus Line 4
6. Interest applied
7. Line 5 plus Line 6
8. Previous month's ending balance
9. Business Objects queries for revenues
10. SAP queries for expenses
11. Line 9 minus Line 10
12. Line 8 plus Line 11
13. Interest applied
14. Line 12 plus Line 13
15. Estimated 2017 Incentive plus prior period true-ups
19. Revenues reduced by transfers to C&I Revolving Loan Funds.

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-6: National Grid 2017 Revolving Loan Funds

Large C&I Electric Revolving Loan Fund

	Income Statement	
(1)	2017 Funds Available	$16,661,388
(2)	2017 Loan budget	$11,000,000
(3)	Committed	$695,050
(4)	Paid	$10,863,658
(5)	Repayments	$4,180,335
(6)	Available 12/31/17	$9,283,015
(7)	Outstanding loan volume	$9,405,746
(8)	Loan defaults during period ($)	$0
(9)	Arrears over 120 days at period end ($)	$2,451
	Program Impact	
(10)	Number of loans	282
(10b)	Participants	122
(11)	Savings (Gross MWh)	26,697
(12)	Savings (Net MWh)	21,586
(13)	Lifetime Savings (Gross MWh)	317,271
(14)	Lifetime Savings (Net MWh)	255,407
(15)	Savings (Gross kW)	3,094
(16)	Saving (Net kW)	2,745
(17)	Total associated incentive volume ($)	$6,394,591
(18)	Total annual estimated energy cost savings	$3,708,935

Small Business Electric Revolving Loan Fund

	Income Statement	
(1)	2017 Funds Available	$2,767,799
(2)	2017 Loan Budget	$4,400,000
(3)	Committed	$438,904
(4)	Paid	$3,097,009
(5)	Repayments	$2,687,171
(6)	Available 12/31/17	$1,919,057
(7)	Outstanding loan volume	$1,973,276
(8)	Loan defaults during period ($)	$0
(9)	Arrears over 120 days at period end ($)	$44,351
	Program Impact	
(10b)	Participants	1,911
(11)	Savings (Gross MWh)	13,394
(12)	Savings (Net MWh)	12,956
(13)	Lifetime Savings (Gross MWh)	159,013
(14)	Lifetime Savings (Net MWh)	158,975
(15)	Savings (Gross kW)	2,065
(16)	Saving (Net kW)	1,860
(17)	Total associated incentive volume ($)	$6,782,577
(18)	Total annual estimated energy cost savings ($)	$1,977,136

Rhode Island Public Energy Partnership (RI PEP)

	Income Statement	
(1)	2017 Funds Available	$483,184
(3)	Committed	$0
(4)	Paid	$18,003
(5)	Repayments	$339,972
(6)	Available 12/31/17	$805,153
(7)	Outstanding loan volume	$757,376
(8)	Loan defaults during period ($)	$0
(9)	Arrears over 120 days at period end ($)	$749
	Program Impact	
(10)	Number of loans	1
(10b)	Participants	1
(11)	Annual Savings (Gross MWh)	26
(12)	Annual Savings (Net MWh)	15
(13)	Lifetime Savings (Gross MWh)	303
(14)	Lifetime Savings (Net MWh)	179
(15)	Savings (Gross kW)	7
(16)	Saving (Net kW)	6
(17)	Total associated incentive volume ($)	$19,080
(18)	Total annual estimated energy cost savings	$3,825

Notes

1 Amount available as of January 1, 2017, including 2017 fund injections detailed in Table E-10. Amount also includes transfers to the revolving loan funds made in the during the 3rd and 4th quarters as detailed in Table E-1 of this report. RI PEP Fund reflects a transfer of $253,322.56 to RI PEP incentives in January 2017.

2 Budget adopted by Sales Team for 2017 operations. Budget includes projections of repayments made during 2017.

3 As of December 31, 2017. Committed in 2017 but to be paid in 2018. Savings not included in 2017.

4 As of December 31, 2017 This includes all project paid in 2017 and the OBR associated with those projects. OBR payment are processed once the associated incentive has been paid usually in batches.

5 As of December 31, 2017

6 Fund balance as of December 31, 2017. Committed funds are subtracted from this amount.

7 Total outstanding loan balance. Loans lent out that still need to be paid back. This includes loans from previous years.

8 Total loan value in default during period.

9 Total loan value in arrears for over 120 days as of December 31, 2017.

10 As of December 31, 2017

10b Unique customer names for large business (one customer name can have multiple sub accounts as is in the case of a franchise). Customer accounts used for small business (not adjusted for net-to-gross).

11 As of December 31, 2017

12 As of December 31, 2017

13 As of December 31, 2017

14 As of December 31, 2017

15 As of December 31, 2017

16 As of December 31, 2017

17 Incentives paid out with loans

18 Estimated energy cost savings to loan fund particpants

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table E-7: 2017 Heat Loans

(1)	Number of loans	720
(2)	Loan amount	$4,265,210
(3)	Measures	
	Pre-Weatherization	5
	Weatherization	415
	Heatsystems	409
	DHW	30
(4)	Percentage of weatherization in loans	58%

Notes

1 Equals the number of participants. As of December 31, 2017

2 Total amount of loans dispersed in 2017.

3 Measures financed through loans.

4 Percentage of Heat Loan recipients that went through with weatherization after audit.

Attachment 2
Gas Year-End Results

Attachment 2

Gas Summary Tables of Year-End Results

NATIONAL GRID ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table G-1: Summary of 2017 Target and Year End Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sector and Program	**Energy Savings (MMBtu)**			**Customer Participation**			**Implementation Expenses ($ 000)**				
Commercial & Industrial	**Approved Target**	**Actual**	**Pct Achieved**	**Approved Target**	**Actual**	**Pct Achieved**	**Approved Budget**	**Actual**	**Pct Achieved**	**Lifetime MMBtu**	**$/Lifetime MMBtu**
Large Commercial New Construction	53,516	35,932	67.1%	149	195	130.8%	$ 1,877.7	$ 2,082.5	110.9%	629,341	$ 3.31
Large Commercial Retrofit	187,938	200,732	106.8%	147	108	73.3%	$ 5,247.5	$ 4,608.1	87.8%	1,629,023	$ 2.83
Small Business Direct Install	3,639	4,273	117.4%	86	117	135.9%	$ 268.7	$ 125.0	46.5%	31,519	$ 3.97
Commercial & Industrial Multifamily	4,434	9,442	213.0%	806	1,997	247.9%	$ 738.9	$ 794.8	107.6%	132,079	$ 6.02
Commercial Demonstration and R&D							$ 73.8	$ 2.6	3.6%		
RI Infrastructure Bank							$ 100.0	$ 100.0	100.0%		
Finance Costs							$ 1,291.7	N/A	N/A		
SUBTOTAL	**249,527**	**250,379**	**100.3%**	**1,188**	**2,417**	**203.5%**	**$ 9,598.1**	**$ 7,713.1**	**80.4%**	**2,421,962**	**$ 3.18**
Subtotal with Finance							*$ 9,598.1*	*$ 9,004.8*	*93.8%*	*2,421,962*	*$ 3.72*
Income Eligible Residential											
Single Family - Income Eligible Services	11,032	14,641	132.7%	590	700	118.6%	$ 3,640.6	$ 3,925.3	107.8%	292,816	$ 13.41
Income Eligible Multifamily	15,810	17,601	111.3%	2,709	3,840	141.7%	$ 2,216.6	$ 1,916.1	86.4%	261,772	$ 7.32
SUBTOTAL	**26,842**	**32,242**	**120.1%**	**3,299**	**4,540**	**137.6%**	**$ 5,857.2**	**$ 5,841.4**	**99.7%**	**554,588**	**$ 10.53**
Non-Income Eligible Residential											
Energy Star® HVAC	27,393	29,680	108.3%	2,104	2,620	124.5%	$ 1,803.5	$ 1,584.3	87.8%	475,160	$ 3.33
Energy*Wise*	28,587	28,024	98.0%	2,250	3,387	150.5%	$ 6,917.2	$ 7,742.8	111.9%	659,612	$ 11.74
EnergyWise Multifamily	11,518	13,143	114.1%	4,101	3,984	97.1%	$ 1,823.6	$ 1,145.5	62.8%	198,819	$ 5.76
Home Energy Reports	59,164	103,087	174.2%	99,001	94,902	95.9%	$ 497.0	$ 504.7	101.6%	103,087	$ 4.90
Residential New Construction	11,575	11,656	100.7%	373	353	94.6%	$ 840.7	$ 920.2	109.5%	201,805	$ 4.56
Comprehensive Marketing - Residential							$ 69.8	$ 99.9	143.1%		
Community Based Initiatives - Residential							$ 79.6	$ 54.7	68.7%		
Residential Demonstration and R&D							$ 264.4	$ 32.3	12.2%		
SUBTOTAL	**138,237**	**185,591**	**134.3%**	**107,829**	**105,246**	**97.6%**	**$ 12,295.7**	**$ 12,084.4**	**98.3%**	**1,638,484**	**$ 7.38**
Regulatory											
EERMC							$ 304.3	$ 304.2	100.0%		
OER							$ 304.3	$ 278.7	91.6%		
SUBTOTAL							**$ 608.5**	**$ 582.9**	**95.8%**		
TOTAL	**414,606**	**468,211**	**112.9%**	**112,316**	**112,202**	**99.9%**	**$ 28,359.5**	**$ 26,221.8**	**92.5%**	**4,615,034**	**$ 5.68**
TOTAL With Finance							***$ 28,359.5***	***$ 27,513.4***	***97.0%***	***4,615,034***	***$ 5.96***

NOTES

(1)(4) Targets from Docket 4654 - Attachment 6, Table G-7 (gas).

(3) Pct Achieved is Column (2)/ Column (1).

(4) Participation was planned and is reported in 'net' terms which takes into account free-ridership and spillover.

Beginning in 2017, Home Energy Reports participation will be counted as the number of customers receiving reports (i.e., the “treatment group”) adjusted by the “Read Rate” of 75% from the most recent Customer Engagement Tracker Survey.

(6) Pct Achieved is Column (5)/ Column (4).

(7) Approved Budget includes Implementation budgets from Docket 4654, Attachment 6 Table G-2 (gas), adjusted to reflect the following transfers made during the 3rd Quarter pursuant to Sections IV.C.1.A of the Energy Efficiency Program Plan for 2017 Settlement of the Parties (2017 Plan) approved in Docket 4654: $208,630 from Large Commercial New Construction to Commercial Finance Costs and $583,048 from Large Commercial Retrofit to Commercial Finance Costs.

(9) Pct Achieved is Column (8)/ Column (7).

(11) $/lifetime MMBtu = Column (8)*1000/Column (10)

NATIONAL GRID NATURAL GAS ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table G-2: Summary of Value and MMBTU Saved by Program
2017 Program Year

	Value ($000)			MMBTU Gas Saved	
	(1) **Total Value**	(2) **Natural Gas Benefits**	(3) **Non-Gas Benefits**	(4) **Annual**	(5) **Lifetime**
Commercial & Industrial					
Large Commercial New Construction	$6,106	$6,051	$55	35,932	629,341
Large Commercial Retrofit	$14,462	$14,457	$5	200,732	1,629,023
Commercial & Industrial Multifamily	$4,297	$1,328	$2,969	9,442	132,079
Small Business Direct Install	$658	$258	$399	4,273	31,519
SUBTOTAL	**$25,523**	**$22,094**	**$3,428**	**250,379**	**2,421,962**
Income Eligible Residential					
Single Family - Income Eligible Services	$13,772	$3,112	$10,659	14,641	292,816
Income Eligible Multifamily	$6,934	$2,673	$4,261	17,601	261,772
SUBTOTAL	**$20,706**	**$5,786**	**$14,920**	**32,242**	**554,588**
Non-Income Eligible Residential					
Energy Star® HVAC	$5,700	$4,834	$866	29,680	475,160
Energy*Wise*	$12,173	$7,272	$4,901	28,024	659,612
EnergyWise Multifamily	$3,578	$2,023	$1,555	13,143	198,819
Home Energy Reports	$935	$935	$0	103,087	103,087
Residential New Construction	$2,357	$2,129	$228	11,656	201,805
SUBTOTAL	**$24,743**	**$17,193**	**$7,550**	**185,591**	**1,638,484**
TOTAL	**$70,972**	**$45,073**	**$25,899**	**468,211**	**4,615,034**

Notes:

(1) Total Benefits equal Natural Gas Benefits plus Non-Gas Benefits.

(3) Non-Gas Benefits include electric benefits and non-resource benefits

NATIONAL GRID NATURAL GAS ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table G-3: Summary of B/C Ratios, Value and Costs ($000's)
2017 Program Year

	(1)	(2)	(3)	(4)	(5)
Commercial & Industrial	**Benefit/ Cost**	**Total Value**	**Program Implementation Expenses**	**Customer Contribution**	**Shareholder Incentive**
Large Commercial New Construction	1.67	$6,106.2	$2,082.5	$1,578.5	
Large Commercial Retrofit	2.43	$14,462.2	$4,608.1	$1,334.1	
Small Business Direct Install	4.79	$657.6	$125.0	$12.2	
Commercial & Industrial Multifamily	4.69	$4,296.7	$794.8	$122.1	
Commercial Demonstration and R&D			$2.6		
Finance Costs			$1,291.7		
RI Infrastructure Bank			$100.0		
SUBTOTAL	**2.03**	**$25,522.8**	**$9,004.8**	**$3,046.8**	**$513.3**
Income Eligible Residential					
Single Family - Income Eligible Services	3.51	$13,771.7	$3,925.3	$0.0	
Income Eligible Multifamily	3.62	$6,933.9	$1,916.1	$0.0	
SUBTOTAL	**3.34**	**$20,705.6**	**$5,841.4**	**$0.0**	**$351.8**
Non-Income Eligible Residential					
Energy Star® HVAC	1.70	$5,700.3	$1,584.3	$1,764.0	
EnergyWise	1.12	$12,172.8	$7,742.8	$3,110.8	
EnergyWise Multifamily	2.98	$3,578.0	$1,145.5	$56.7	
Home Energy Reports	1.85	$935.2	$504.7	$0.0	
Residential New Construction	1.26	$2,357.1	$920.2	$952.1	
Residential Demonstration and R&D			$32.3		
Community Based Initiatives - Residential			$54.7		
Comprehensive Marketing - Residential			$99.9		
SUBTOTAL	**1.32**	**$24,743.4**	**$12,084.4**	**$5,883.6**	**$768.5**
Regulatory					
EERMC			$304.2		
OER			$278.7		
SUBTOTAL			**$582.9**		
TOTAL	**1.86**	**$70,971.8**	**$27,513.4**	**$8,930.4**	**$1,633.5**

Notes:

1) RI Total Resource Cost test Benefit/Cost Ratio = Total Value/(Program Implementation Expenses + Customer Contribution + Shareholder Incentives).

(2) Year-End Value Total from Table G-2.

(3) Year-End Implementation Expenses by Program from Table G-1 including payments to RIIB and Finance Costs.

(5) Shareholder incentives from Table G-4.

NATIONAL GRID NATURAL GAS ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table G-4: National Grid 2017 EE Incentive Calculation

Incentive Rate: 5.00%

Sector	(1) Approved Spending Budget	(2) Target Incentive	(3) Annual Savings Goal (MMBTU)	(3a) Actual Spending	(3b) % of Approved Spending	(3c) Budget Adjusted target MMBtu Savings	(4) Threshold MMBtu Savings
Income Eligible Residential	$ 5,857,179	$ 292,859	26,842	$ 5,841,374	99.7%	26,842	20,131
Non-Income Eligible Residential	$ 12,295,691	$ 614,785	138,237	$ 12,084,389	98.3%	138,237	103,678
Commercial & Industrial	$ 9,598,121	$ 479,906	249,527	$ 9,004,756	93.8%	234,101	175,576
Total	**$ 27,750,991**	**$ 1,387,550**	**414,606**	**$ 26,930,518**	**97.0%**	**399,180**	**299,385**

Sector	(5) Actual MMBtu	(6) % of Target Savings	(7) Savings Eligible for Incentive	(8) Earned Savings Incentive	(9) % of Target Incentive Achieved
Income Eligible Residential	32,242	120.1%	32,242	$351,774	120.1%
Non-Income Eligible Residential	185,591	134.3%	172,796	$768,481	125.0%
Commercial & Industrial	250,379	107.0%	250,379	$513,276	107.0%
Total	**468,211**	**117.3%**	**455,417**	**$1,633,531**	**117.7%**

Notes:

(1) Budget from 2017 EEPP. Includes Implementation; excludes Regulatory Costs, and Shareholder Incentive.
(2) Equal to the incentive rate (5.0%) x Column (1).
(3) Approved savings goal from 2017 EEPP
(3a) Actual spending includes actual Implementation Expenses from Table G-1. It excludes excludes Regulatory Costs, and Shareholder Incentive.
(3b) Column (3a)/ Column (1)
(3c) Column (3) * (3b), only if 100% of Target Savings were achieved in Column (3)
(4) 75% of Target MMBtu Savings
(5) Year End Savings from Table G-1
(6) Column (5)/ Column (3c)
(7) If Column (6) is less than 75%, Column (8) = 0,
If Column (6) is between 75% and 125%, Column (7) = Column 5;
If Column (6) is greater than 125%, Column (7) = 125% of Column (3c) due to the incentive cap.
(8) The shareholder incentive will be calculated as follow, where SB is the Spending Budget in the sector:
From 75% of savings to 100% of savings: Shareholder Incentive = SB x (0.15 x % of savings achieved – 0.10)
From 100% of savings to 125% of savings: Shareholder Incentive = SB x (0.05 x % of savings achieved)
(9) Column (9) / Column (2)

National Grid: RIG

TABLE G-5
OVERALL ANALYSIS OF NATURAL GAS ENERGY EFFICIENCY FUND BALANCE

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	TOTAL
1. Start Of Period Balance	($903,962)	$2,194,541	$5,075,085	$7,616,059	$7,158,249	$7,723,115	($903,962)
2. Revenue	$4,528,002	$4,275,195	$3,500,429	$2,240,413	$2,164,277	$1,432,104	$18,140,419
3. Monthly EE Expenses	$1,430,439	$1,399,948	$969,362	$2,710,525	$1,611,802	$2,002,152	$10,124,228
4. Cash Flow Over/(Under)	$3,097,563	$2,875,247	$2,531,066	($470,112)	$552,475	($570,049)	$8,016,191
5. End Of Period Balance Before Interest	$2,193,601	$5,069,789	$7,606,152	$7,145,948	$7,710,724	$7,153,066	$7,112,229
6. Interest	$940	$5,297	$9,907	$12,302	$12,391	$13,172	$54,009
7. End Of Period Balance After Interest	$2,194,541	$5,075,085	$7,616,059	$7,158,249	$7,723,115	$7,166,238	$7,166,238

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR END TOTAL
8. Start Of Period Balance	$7,166,238	$7,045,294	$5,713,749	$4,203,715	$2,723,599	$743,715	($903,962)
9. Revenue [19]	$1,117,150	$929,872	$162,007	$777,528	$636,565	$2,010,943	$23,774,485
10. Monthly EE Expenses	$1,251,404	$2,273,368	$1,681,330	$2,264,133	$2,619,697	$6,007,605	$26,221,765
11. Cash Flow Over/(Under)	($134,254)	($1,343,496)	($1,519,322)	($1,486,604)	($1,983,132)	($3,996,663)	($2,447,280)
12. End Of Period Balance Before Interest	$7,031,983	$5,701,798	$4,194,426	$2,717,111	$740,467	($3,252,948)	($3,351,242)
13. Interest	$13,311	$11,950	$9,289	$6,488	$3,248	($2,483)	$95,811
14. End Of Period Balance After Interest	$7,045,294	$5,713,749	$4,203,715	$2,723,599	$743,715	($3,255,431)	**($3,255,431)**
15. 2017 Incentive							**$1,633,531**
16. Ending Balance after Incentive							**($4,888,962)**

Notes
1. Previous year's ending balance
2. Business Objects queries for revenues
3. SAP queries for expenses
4. Line 2 minus Line 3
5. Line 1 plus Line 4
6. Interest applied
7. Line 5 plus Line 6
8. Previous month's ending balance
9. Business Objects queries for revenues
10. SAP queries for expenses
11. Line 9 minus Line 10
12. Line 8 plus Line 11
13. Interest applied
14. Line 12 plus Line 13
15. Estimated 2017 Incentive plus prior period true-ups
19. Revenues reduced by transfers to C&I Revolving Loan Fund.

NATIONAL GRID ELECTRIC ENERGY EFFICIENCY PROGRAMS IN RHODE ISLAND
Table G-6: National Grid 2017 Revolving Loan Funds

Large C&I Gas Revolving Loan Fund

	Income Statement	
(1)	2017 Funds Available	$2,271,385
(2)	2017 Loan budget	$1,000,000
(3)	Committed	$0
(4)	Paid	$680,811
(5)	Repayments	$418,535
(6)	Available 12/31/17	$2,009,109
(7)	Outstanding loan volume	$1,062,568
(8)	Loan defaults during period ($)	$0
(9)	Arrears over 120 days at period end ($)	$63,332
	Program Impact	
(10b)	Participants	29
(11)	Annual Savings (Gross MMBtu)	49,846
(12)	Annual Savings (Net MMBtu)	36,449
(13)	Lifetime Savings (Gross MMBtu)	456,767
(14)	Lifetime Savings (Net MMBtu)	333,999
(17)	Total associated incentive volume ($)	$464,280
(18)	Total annual estimated energy cost savinç	$507,369

Rhode Island Public Energy Partnership (RI PEP) Gas

	Income Statement	
(1)	2017 Funds Available	$92,565
(4)	Paid	$0
(5)	Repayments	$1,652
(6)	Available 12/31/17	$94,217
	Program Impact	
(10b)	Participants	0
(11)	Savings (MMBtu)	0

Notes

1 Amount available as of January 1, 2017, including 2017 fund injections detailed in Table G-10. Amount also includes transfers to the revolving loan funds made in the during the 3rd quarter as detailed in Table G-1 of this report.

2 Budget adopted by Sales Team for 2017 operations. Budget includes projections of repayments made during 2017.

3 As of December 31, 2017. Committed in 2017 but to be paid in 2018. Savings not included in 2017.

4 As of December 31, 2017 This includes all project paid in 2017 and the OBR associated with those projects. OBR payment are processed once the associated incentive has been paid usually in batches.

5 As of December 31, 2017

6 Fund balance as of December 31, 2017. Committed funds are subtracted from this amount.

7 Total outstanding loan balance. Loans lent out that still need to be paid back. This includes loans from previous years.

8 Total loan value in default during period.

9 Total loan value in arrears for over 120 days as of December 31, 2017.

10 As of December 31, 2017

10b Unique customer names for large business (one customer name can have multiple sub accounts as is in the case of a franchise). Customer accounts used for small business (not adjusted for net-to-gross).

11 As of December 31, 2017

12 As of December 31, 2017

13 As of December 31, 2017

14 As of December 31, 2017

15 As of December 31, 2017

16 As of December 31, 2017

17 Incentives paid out with loans

18 Estimated energy cost savings to loan fund particpants

Attachment 3
Case Studies

Attachment 3

Case Studies

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CASE STUDY - INDUSTRIAL ENERGY EFFICIENCY

Energy efficiency has landed

At Rhode Island's T.F. Green Airport, the newest arrival is LED lighting.

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Easier. Faster. Further. That's the kind of travel T.F. Green Airport wants its customers to experience.

It's been their commitment for more than 80 years – a commitment that's now fulfilled by Rhode Island Airport Corporation (RIAC), the operator of Rhode Island's six state-owned airports. Since 1992, RIAC has been operating and innovating RI's airports. It's especially true for Warwick's T.F. Green Airport, where energy-efficient LED lighting upgrades have transformed both the inside and outside into brighter, safer and more welcoming spaces.

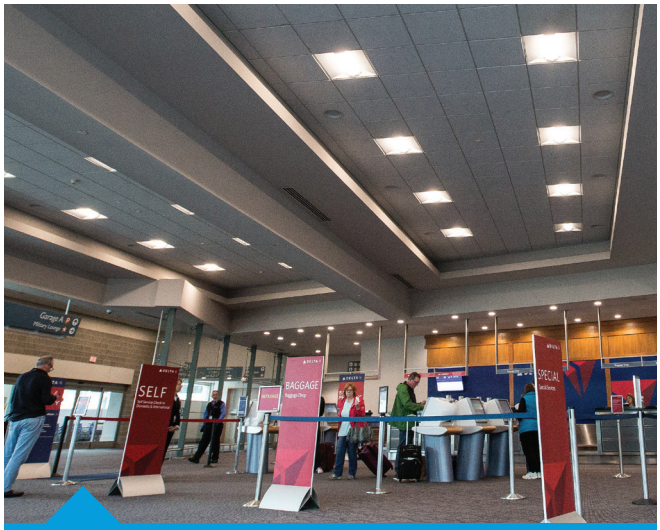
LIGHTING THE WAY FOR ENERGY EFFICIENCY

In partnership with National Grid, Energy Source (National Grid's leading project expeditor) and electrical contractor Collard Enterprises, Inc., RIAC completed an interior and exterior lighting overhaul at T.F. Green. It all began with an energy audit from Energy Source, followed by LED lighting test cases conducted by RIAC's Joe DaSilva, Assistant Vice President of Landside Maintenance.

Joe compared lighting output levels and coverage of old bulbs to new LEDs and gathered feedback from key airport stakeholders. The results? Everyone involved noticed brighter, more evenly distributed light from LEDs, which weren't even operating at 100% light output.

UPGRADES TAKE OFF

After the successful lighting test cases, RIAC and National Grid completed a major airport LED lighting upgrade, replacing terminal, roadway, garage and parking lot fluorescent and high-intensity discharge (HID) lighting with LEDs individually equipped with motion and light-level sensors.



"National Grid has been a great partner over the years," said RIAC's Joe DaSilva. *"We've done numerous rebate projects with them, and they've always advocated different energy incentives that we can capitalize on."*

SOARING INTO SAVINGS

	Project cost	Annual energy savings	Annual energy cost savings	National Grid incentives provided	Payback period
New LED interior and exterior lighting	**$4,121,705**	**5,566,890 kWh**	**$855,276**	**$2,282,958**	**2.15 years**

While the estimated annual energy cost savings of the upgrade was very sizeable, this project wouldn't have gotten off the ground without National Grid incentives and on-bill financing.

"The savings we were achieving were offsetting the cost of the project. And because National Grid financed it for us with on-bill financing, it was almost a net zero cost to us." – Joe DaSilva, RIAC

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COMING THROUGH WITH FLYING COLORS

The lighting cost savings alone have made this upgrade a success. But there are many benefits beyond lower utility bills that RIAC, T.F. Green and travelers now experience.

Brighter, more appealing spaces – The terminal main lobby and baggage claim area now feature the crisp, white light only LEDs can offer. These new dimmable LEDs can be reduced to 60-80% of their total light output and still provide the needed illumination. Customers can enjoy a well-lit, welcoming environment all throughout the airport.

Improved safety – Bright LED lighting provides enhanced visibility and, in turn, safety. Unlike HID exterior lighting, LEDs have instant-on capabilities. It doesn't take them 15 minutes to come to full power when they're turned on after a period of inactivity. Parking lots, terminal ramps, roadways and building perimeters are safer and more secure.

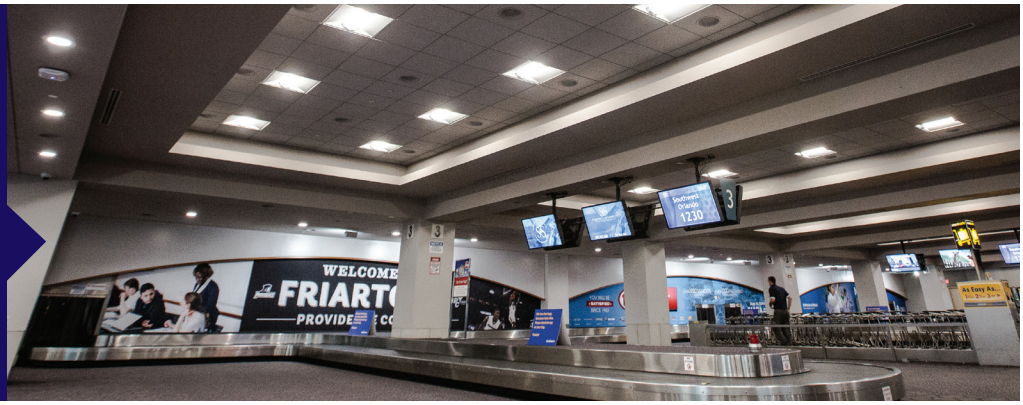
Increased employee productivity – Because LED lighting closely mimics natural light, it's easier on the eyes and helps employees see better and stay more alert, which can boost productivity.

Greater lighting control – Built-in motion and light-level sensors are programmable and enable individual light control, making it easier and more efficient to take advantage of free daylight and power down lights in unoccupied spaces.

Reduced maintenance costs – Thanks to the long lifespans and durability of LEDs, less time and money will be spent repairing and replacing fixtures and bulbs.

"We received nothing but positive feedback from customers and airport staff members about the LEDs."

– Joe DaSilva, RIAC



Award-winning energy efficiency

In recognition of their impressive lighting upgrade at T.F. Green, RIAC was one of only six businesses honored by Northeast Energy Efficiency Partnerships (NEEP) as a 2016 Northeast Business Leader for Energy Efficiency.

BRING ALL OF THE BENEFITS OF ENERGY EFFICIENCY TO YOUR FACILITY.

National Grid is ready to help you make it happen. We've got the financial incentives and technical support you need to successfully complete your upgrades.

Connect with us today: 1-800-787-1760 energysavings@ngrid.com ngrid.com/business

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Income Eligible Program

Rose's Home — Cranston, RI

Rose from Cranston, RI had the Income Eligible Program perform energy efficiency services on her home. The result was a home with improved health and safety through the installation of a new high efficiency boiler, a new hardwired carbon monoxide and smoke detectors, LED lamps and indoor air quality measures. Home comfort was also improved with air sealing to reduce drafts, attic and wall insulation, LED lamps for cool bright light, an energy efficient refrigerator, smart power strips that automatically turn off equipment that isn't in use. The energy efficiency measures installed help to reduce Rose' energy costs by more than 30%!

The result:

Total Project cost	$19,499.16
National Grid incentive	$11,637.77
Department of Human Services Contribution	$7,681.39
Customer Contribution	$0
Annual Energy Efficiency $ savings	30%

Energy Efficiency Solutions

- Appliance Management Program
- Weatherization
- Heating System Replacement

As a National Grid customer, you may be eligible for a Home Energy Assessment, at no cost to you. The assessment will measure your home's energy efficiency and put you on the path to reducing costs and saving big on home energy improvements.

Cranston, RI

"This work will make it possible for me to afford to stay in my home where I've lived for almost forty years."

- Rose, Income Eligible Program Participant

To schedule a home energy assessment: Call 1-888-633-7947 |
https://www.nationalgridus.com/RI-Home/Energy-Saving-Programs/Income-Eligible-Services

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Direct Install Program

Columban Fathers Senior Living Facility Bristol, RI

National Grid implemented energy efficiency renovation measures for a senior living facility in Bristol RI. The facility has studio and two-room apartments, kitchen and dining facilities, meeting rooms, offices, and lounges. The facility is approx. 40,000 sqft.

The result:

Total Project cost	$83,000
National Grid incentive	$48,140
Customer Contribution	$34,860
Customer Annual $ savings	$17,000
Annual kwh savings	63,000 kwh
Annual therm savings	6,400 therms

Energy Efficiency Solutions

- LED Lighting and sensors
- Custom Lighting
- Boiler Controls
- Gas domestic hot water measures

As a National Grid small business customer, you may be eligible for a Home Energy Assessment, at no cost to you. The assessment will measure your home's energy efficiency and put you on the path to reducing costs and saving big on home energy improvements.

Bristol, RI

To schedule a home energy assessment: Call 1-888-633-7947 |
https://www.nationalgridus.com/RI-Business/Energy-Saving-Programs/Small-Business

Attachment 4
2017 Year-End Memo.

Attachment 4

2017 Year-End Participation Memo

2017 Year-End Participation Memo

I. Participation Overview

National Grid recognizes the importance of program participation in designing efficiency services, reaching diverse markets, meeting customer demand, and finding all efficiency opportunities. Complementary to the gas and electric savings that the Company seeks to achieve each year, participation contextualizes the impact of efficiency. It reveals who is benefiting from the programs and how. The objective of this memo is to measure unique participants, participation over time, and total customers reached over time.

The Company offers several types of services that enable customers to participate in a variety of ways and this complicates how to measure participation. Programs and initiatives such as EnergyWise and EnergySmart Grocer (ESG) retrofit a home or business in a deep way which may include a technical assessment and multiple measures are installed. The Company also delivers efficiency to a large number of customers through broad channels that make efficient products accessible to customers. These broad efforts tend to focus on one measure at a time and are intended to transform the market so that customers make energy efficient choices. Examples include the ENERGY STAR® Lighting program and the Commercial and Industrial (C&I) Upstream Lighting initiative. For these broad offerings, it is difficult to precisely measure participation levels cumulatively and compare to participation in other deeper programs. Therefore, this memo focuses on participation levels in deep services that offer customers the most benefits.

Programs and initiatives are designed and delivered in very specific ways in order to maximize their potential to achieve energy savings. Therefore, specific data differs among programs and what is defined as a 'participant' may differ as well. A breakdown of participation units used for reporting gas and electric programs in 2017 is found below. The participation numbers found in Tables E-1 and G-1 in Attachments 5 and 6, respectively, of Docket 4654 - National Grid Electric and Gas Energy Efficiency Program Plan, filed with the Commission on October 17, 2016, are in these units.

Participation Reporting Units

Fuel	Sector	Program	Participation Unit
Gas	Commercial & Industrial	Large Commercial New Construction	Unique Account
		Large Commercial Retrofit	Unique Account
		Small Business Direct Install	Unique Account
		C&I Multifamily	Housing Units
	Income Eligible Residential	Single Family – Income Eligible Services	Unique Account
		Income Eligible Multifamily	Housing Units
	Residential	Energy Star® HVAC	Unique Account
		EnergyWise	Unique Account

		EnergyWise Multifamily	Housing Units
		Home Energy Reports	Unique Account
		Residential New Construction	Housing Units
Electric	Commercial & Industrial	Large Commercial New Construction	Unique Account
		Large Commercial Retrofit	Unique Account + Unique Customer names from Upstream Lighting
		Small Business Direct Install	Unique Account
	Income Eligible Residential	Single Family – Income Eligible Services	Unique Account
		Income Eligible Multifamily	Housing Units
	Residential	Energy Star® HVAC	Unique Account
		EnergyWise	Unique Account
		EnergyWise Multifamily	Housing Units
		Home Energy Reports	Unique Account
		Residential New Construction	Housing Units
		ENERGY STAR® Lighting	Estimated Housing Units
		ENERGY STAR® Products	Number of Rebates

As the table shows, participation is counted in different ways depending on the program.

1. Unique billing accounts: The predominate means for tracking participants. This is defined as one electric or gas account number.

2. Housing units: This method is used in the electric and gas Residential New Construction program and multifamily programs. For New Construction programs, buildings are typically under construction, so accounts do not yet exist. National Grid, therefore, tracks the number of housing units for participation. This method is also applied to all multifamily programs, where complexes and not individual apartments tend to have accounts. These programs are focused on the impact to the apartment dwellers, so from a program design perspective, understanding the number of housing units affected, is of greater interest. Please note that for the gas programs only gas-heated units are counted as participants. In the case that an electric or delivered-fuel-heated dwelling is part of the impacted complex, it would not be counted as a participant.

3. Rebates: In the ENERGY STAR® Products program, the Company reports the number of rebates processed because not every rebate contains account information.

4. Estimated bulbs per home: Within the ENERGY STAR® Lighting program, retailers do not disclose information identifying their customers, thereby precluding the connection of bulb purchases to

utility accounts. The number of bulbs, therefore, is translated into an estimate of participants based on purchasing pattern research[1].

5. Unique customer names: This method is used in the C&I Upstream Lighting Initiative. Customer account information is not collected at the point of sale as it would delay the process and can be a potential barrier to the success of the program. Therefore, the Company must analyze unique customer names and addresses to determine unique participants.

II. Unique Cumulative Participation

Objective

The integration of efficiency services, from the identification of HVAC opportunities during home audits to product offerings through the Home Energy Reports web portal, means that a single customer may be counted as a participant in multiple programs. Continued interest in efficiency, moreover, may lead that customer to participate in consecutive years. Such overlap in participation, both over time and across programs, has become important to National Grid and its stakeholders as it is important in understanding the progress that energy efficiency programs have made in benefitting Rhode Island electric and gas customers.

Methodology

The tables and graphs below show the unique annual and cumulative customer accounts associated with certain efficiency programs, sector, and fuel for the period 2012-2017. The tables are organized using the following:

- Annual Program Counts
    - Represents the unique accounts associated with an individual program in a given year. It removes all double counting within a given program within a given year. For example, if a customer participated in the HVAC program twice in 2016, they would only be counted once.
    - Please note that some overlap exists within the home audit programs, but not because of repeat audits. Program policy requires customers wait three years before receiving another audit. However, follow-up work to an audit in 2013, such as weatherization, could occur in 2014. One account, therefore, would appear as a unique participant in two different years.
    - For the Company's 2012 and 2013 Year End Reports, the program participation counts did not remove this double counting. The program participation counts for 2012 and 2013 below, therefore, may differ from how they were reported in the 2012 and 2013 Year End Reports.

[1] 2016-2018 Massachusetts Joint Statewide Three Year Electric and Gas Energy Efficiency Plan. Appendix J. Participant Definitions: Residential Lighting Assumptions

- Additive
    - The sum of Annual Program Counts.

- Cumulative
    - Eliminates all double counting within a program across multiple years. For example, if a customer participated in the HVAC program in 2013 and then again in 2016, they would only be counted once. Therefore, the cumulative count may be less than the additive count since it removes customers that participate in the same program more than once.

- Sector (Residential, Income Eligible, and Commercial) Subtotals
    - Eliminates all double counting across programs for a given year. For example, if a customer participated in the HVAC program and the EnergyWise program in 2017, they would only be counted once. Therefore, the sector subtotal may be less than the sum of all the annual program counts in a given year.

- Portfolio Total
    - Eliminates all double counting across sectors for a given year. For example, if a customer participated in the Income Eligible Single Family Program and also the ENERGY STAR® Products program in 2017, they would only be counted once. Therefore the portfolio total may be less than the sum of all annual participant counts.

- Percent Unique Accounts:
    - This represents the ratio of cumulative to additive program participation counts. The result is the percentage of customers that only participated in a given program one time from 2012-2017.

- Percent Unique Program Participants:
    - This represents the ratio of the sector subtotal (unique counts) to the sum of annual participant counts in a given year. The result is the percentage of customers that only participated in one program during a given year.

- Portfolio Cumulative
    - The set of unique accounts across all programs and years, with all overlap removed. For example, if an account is found in EnergyWise for 2013 and ENERGY STAR® Products for 2014, it would only appear once in the Portfolio Cumulative Count.

- Important Exclusions
    - The counts shown below do not include participants in Home Energy Reports, ENERGY STAR® Lighting, and C&I Upstream Lighting (an initiative tracked under Commercial New Construction before 2016 and under Commercial Retrofit starting in 2016). While Home

Energy Reports is an important program that reaches broad participation and savings while driving customers to other program opportunities, it was excluded because its hundreds of thousands of participants would overwhelm the cumulative counts, thereby obscuring any trends that could otherwise be observed. Neither ENERGY STAR® Lighting nor Commercial Upstream Lighting collects account information so neither could be included in this analysis. The electric and gas participants for these programs, however, are included in tables E-1 and G-1 in Attachments 1 and 2 respectively.

- Not all rebates processed through the ENERGY STAR® Products contain account information. Therefore, rebates without account information are not included in this analysis. For this reason, annual program counts below are lower than the total number of customers that participated in this program. For example, in 2016, 25,171 rebates were processed through the program compared to 2,622 participants shown below. Likewise, the number of rebates in the ENERGY STAR® Products program reported in E-1 will be higher than the number of accounts detailed below because not all rebates include account information.
- In the year-end report, the Company counts EnergyWise Multifamily and EnergyWise Multifamily Income Eligible participation by units in treated buildings. When units are used, if 51% of the building is income-eligible, the whole building and all units within are treated and counted as income eligible. However, since this analysis uses account numbers, and account numbers track with a rate class, the results below will show a higher split of market rate to income eligible multifamily participants. Multifamily programs are included in this unique account analysis to remove overlaps with other programs to the best extent possible.
- 2012 was chosen as the baseline year because it represents the first year of 2012-2014 Three Year Plan.

Trends in EE Program Participation

The tables and figures below provide insight into participation trends across programs and years. Overall, 2017 program participation at the sector-level remained at a similar level to 2016 participation. The program-specific observations on participation trends from 2016 and 2017 are highlighted below.

- Residential HVAC participation increased by more than 50% while Energy Star Products participation more than doubled. The Company will continue to offer a wide array of energy efficiency measures through these programs to reach more customers.
- For single family programs, EnergyWise participation slightly increased while Income Eligible Services participation remained similar to 2016 levels. The Company will continue to focus on marketing and promotions of these programs to encourage participation.
- For multifamily programs, EnergyWise participation declined by approximately 34% for electric and 19% for gas. As noted in 2017 Year-End Report, the EnergyWise program saw a shift to serving more customers in condominium complexes, which traditionally have lower participation rates and the lead vendor met was met with fewer opportunities for retrofit while on site due to high historical program participation and measures previously installed. On the

other hand income eligible participation increased by 15% for electric and dropped by 75% for gas. The notable decline in the number of gas accounts served under income eligible services program is due to serving a large number of master metered facilities with large measures such as central boiler replacements.

- For C&I programs, new construction participation declined by approximately 20% for electric and increased by 30% for gas while the reverse is observed for retrofit program with approximately 50% higher participation for electric while gas participation declined by 60%. The C&I retrofit gas participation also includes the C&I multifamily program. The large drop in C&I retrofit gas participation is largely due to a lower number of gas accounts served through the multifamily program in 2017.
- Overall, the Company reached approximately 144,000 electric customers and 53,600 gas customers from 2012 to 2017

Examining the percentage of unique program participants in a single year, it is evident that there is little overlap between programs. This trend is seen across all three sectors (C&I, Income Eligible, Residential). These results are not surprising in the Income-Eligible Sector where customers would either participate in the single family or multifamily program, nor are they in the C&I sector where programs are more segmented. However, in the residential sector, customers are encouraged to participate in multiple programs in any given year. These results indicate there may be more the Company can do in terms of cross-program promotion to drive more participation in the same year. In addition, these results can be shared with the marketing team to further promote a collaborative approach. The Company recently brought back the cross-vendor meeting to encourage promoting all programs across vendor channels.

Another trend can be found in the difference between the additive versus cumulative participation in a single program across multiple years, shown in the Percent Unique Accounts column. At the sector level, electric C&I customers appear to participate in the same program, in multiple years. While one can infer that these C&I customers see enough value in these programs to participate multiple times, it also may indicate that the Company is reaching a smaller portion of the total C&I customer pool. There are several reasons this could be occurring. In the C&I sector, many customers that have not participated face barriers such as lack of financing and tenant/owner split incentives. In order to address this issue, the Company continues to grow its on-bill repayment fund to provide financing to more C&I customers. In addition, the introduction of Commercial PACE should drive new participants from sectors like commercial office buildings and nursing homes.

In 2017, the Company continued its efforts to reach new C&I customers through its market sector approach where marketing is directed and customized to an entire commercial sector such as the grocery industry or hospitality sectors. The Company also continues to attract new C&I customers through the expansion of upstream delivery to more lighting products, gas water heaters, and HVAC products.

The multifamily program-level trends are not likely representative due to the fact that the Company generally counts all units in a participating facility. In Spring 2016, the Company started tracking participating units in addition to counting all units in a multi-family facility. Section III of this memo provides details on units served through the multifamily programs.

Table 1. Electric Cumulative Participation 2012-2017

Participation by Accounts

		Annual Counts						Additive	Cumulative	% Unique Accounts
Sector	**Program**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2012-2017**	**2012-2017**	
Residential	**Energy Star® HVAC**	1,414	3,049	2,445	2,091	1,978	3,023	14,000	13,165	94%
	ENERGY STAR® Products	9,520	6,254	6,922	4,461	2,622	6,630	36,409	34,305	94%
	EnergyWise	6,760	8,645	9,898	11,665	9,567	10,159	56,694	50,104	88%
	EnergyWise Multifamily	2,626	3,531	5,277	8,014	11,408	7,516	38,372	27,898	73%
	Residential Subtotal	19,726	20,774	23,776	25,561	25,103	26,411	141,354	113,603	80%
	% Unique Participants	97%	97%	97%	97%	98%	97%			
Income Eligible	**Single Family – Income Eligible Services**	2,654	2,646	3,054	2,851	3,016	3,074	17,295	14,686	85%
	Income Eligible Multifamily	1,410	2,010	3,104	1,383	1,999	2,289	12,195	9,495	78%
	Income Eligible Subtotal	4,062	4,656	6,158	4,234	5,023	5,322	29,447	24,151	82%
	% Unique Participants	100%	100%	100%	100%	100%	99%			
Commercial	**Large Commercial New Construction**	162	167	169	236	251	195	1,180	969	82%
	Large Commercial Retrofit	405	350	432	459	400	593	2,639	1,908	72%
	Small Business Direct Install	1,282	1,175	960	1,049	797	718	5,981	5,191	87%
	Commercial Subtotal	1,808	1,651	1,513	1,682	1,380	1,450	9,484	7,430	78%
	% Unique Participants	98%	98%	97%	96%	95%	96%			
Portfolio Total		25,545	27,032	31,307	31,448	31,449	33,086	179,867	143,868	80%

Table 2. Gas Cumulative Participation 2012-2017

Participation by Accounts

		Annual Counts						Additive	Cumulative	% Unique Accounts
Sector	**Program**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2012-2017**	**2012-2017**	
Residential	**Energy Star® HVAC**	6,383	4,865	3,037	1,980	1,652	2,949	20,866	19,682	94%
	EnergyWise	1,413	1,946	2,737	2,830	3,252	3,387	15,565	14,438	93%
	EnergyWise Multifamily	1,792	762	3,146	4,291	5,394	4,380	19,765	14,402	73%
	Residential Subtotal	9,338	7,352	8,662	8,909	10,112	10,461	54,834	45,375	83%
	% Unique Participants	97%	97%	97%	98%	98%	98%			
Income Eligible	**Single Family – Income Eligible Services**	388	398	539	529	722	700	3,276	3,098	95%
	Income Eligible Multifamily	48	261	531	532	1,121	282	2,775	2,282	82%
	Income Eligible Subtotal	436	659	1,070	1,061	1,841	934	6,001	5,377	90%
	% Unique Participants	100%	100%	100%	100%	100%	95%			
Commercial	**Large Commercial New Construction**	112	161	115	134	206	268	996	915	92%
	Large Commercial Retrofit[1]	431	476	159	656	611	240	2,573	2,348	91%
	Small Business Direct Install	160	111	297	121	50	122	861	835	97%
	Commercial Subtotal	678	725	549	892	852	614	4,310	3,774	88%
	% Unique Participants	96%	97%	96%	98%	98%	97%			
Portfolio Total		10,437	8,728	10,271	10,462	12,406	11,963	64,267	53,581	83%

[1]Includes C&I multifamily program

Figure 1. Electric and Gas Participation by Sector, 2012-2017

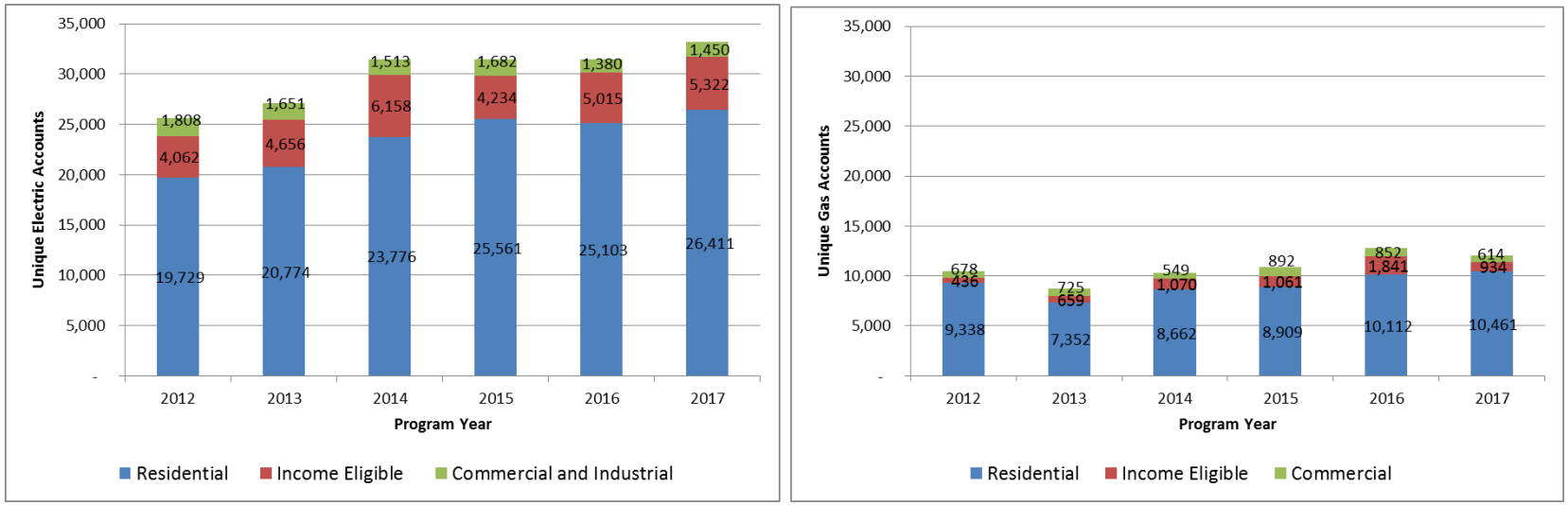


Figure 2. Electric and Gas Participation, Residential Sector by Program, 2012-2017

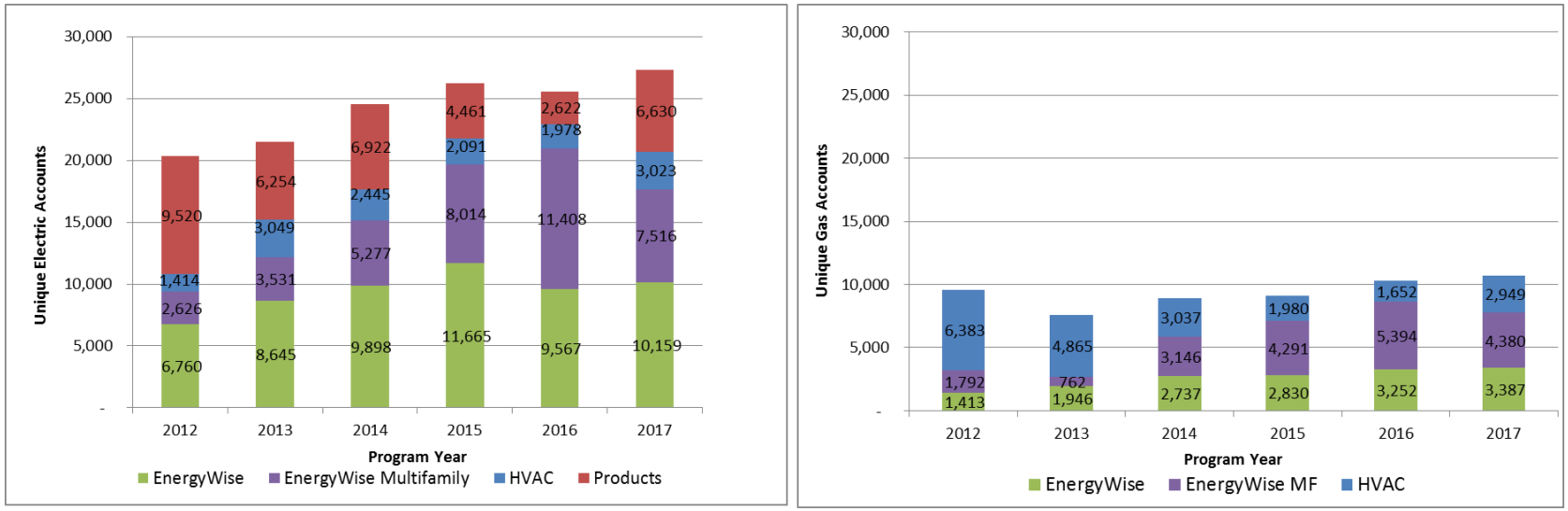
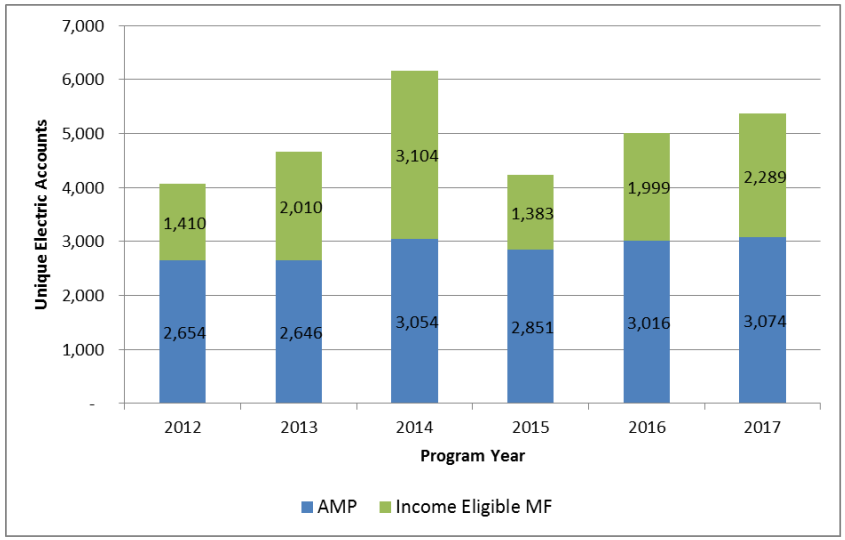


Figure 3. Electric and Gas Participation, Income-Eligible Sector by Program, 2012-2017



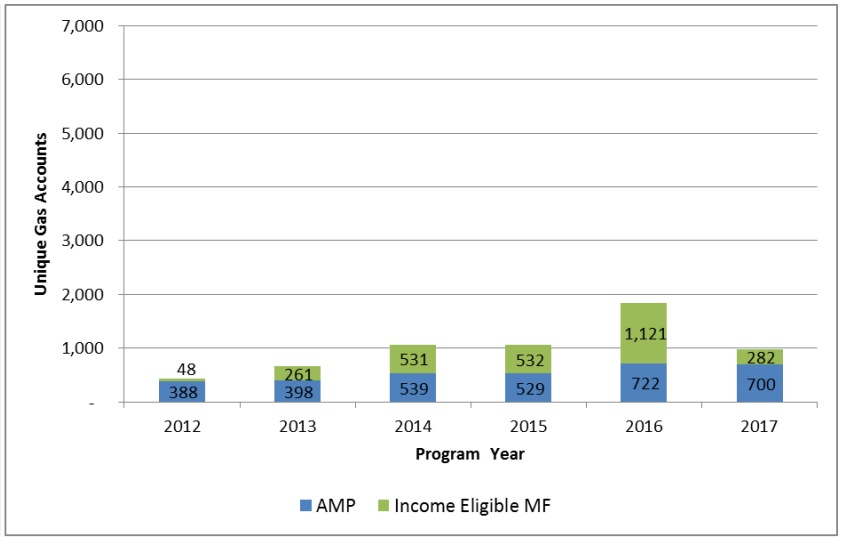
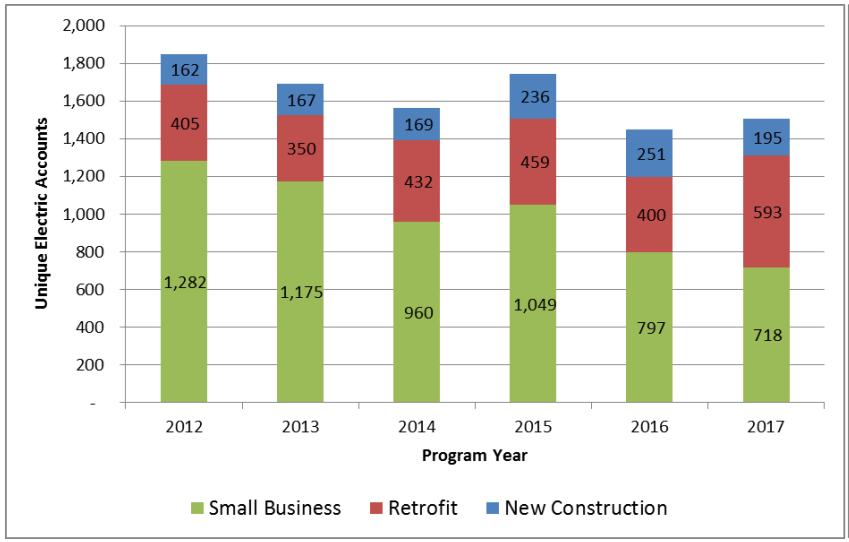
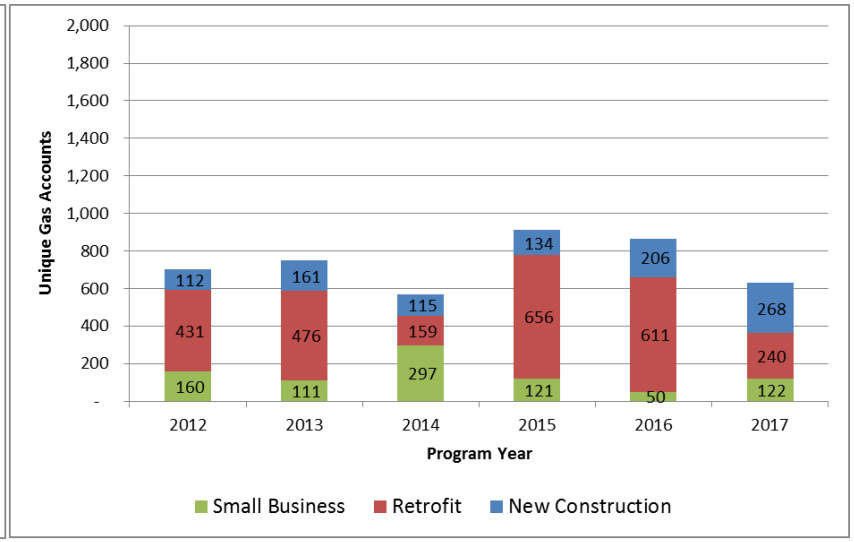


Figure 4. Electric and Gas Participation, Commercial Sector by Program, 2012-2017





III. Housing Units

The annual housing units are defined as unique in the same sense as billing accounts. Housing units are presented below for the Electric and Gas EnergyWise Multifamily program, Electric and Gas Income Eligible Multifamily program, the Commercial and Industrial (C&I) Multifamily Gas program, and the Electric and Gas Residential New Construction Program.

In multifamily programs, the unique number of account shown in the previous section (Tables 1 and 2) do not fully represent the participation trend for these programs. That is because not all individual units have separate accounts as a building might be master metered. Therefore, in Table E-1 and G-1 of the year-end report, the Company counts all housing units in treated buildings for participation, which is also shown below. Please note that multifamily housing units cannot be shown as cumulative because the Company does not have specific unit data within a treated facility and therefore cannot remove overlap between years.

Participation in the Residential New Construction program is also defined by housing units since accounts do not yet exist. In this program, housing units are only reported once, at the time of completion, so there is no overlap between units across multiple years. Therefore, the Company can show this program in terms of cumulative unique participation.

Table 3. Electric Participation by Housing Units

	Annual Housing Units*						Additive
Program	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2012-2017**
Residential New Construction	406	473	573	442	526	680	3,100
EnergyWise Multifamily	2,660	3,539	5,322	7,710	7,783	3,557	30,571
Income Eligible Multifamily	3,878	5,370	5,977	4,610	5,366	5,162	30,363
Portfolio Total	**6,944**	**9,382**	**11,872**	**12,762**	**13,675**	**9,399**	**64,034**

*For multifamily programs, 2016 and 2017 counted only participating housing units in participating facilities while 2012-2015 counted all housing units in a participating facility.

Table 4. Gas Participation by Housing Units

	Annual Housing Units*						Additive
Program	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2012-2017**
C&I Multifamily	0	1,066	939	2,345	2,982	1,997	9,329
Residential New Construction	252	425	500	366	341	353	2,237
EnergyWise Multifamily	1,569	984	2,496	3,147	2,232	3,984	14,412
Income Eligible Multifamily	977	2,773	3,090	3,956	4,701	3,840	19,337
Portfolio Total	**2,798**	**5,248**	**7,025**	**9,814**	**10,256**	**8,262**	**43,403**

* For multifamily programs, 2016 and 2017 counted only participating housing units in participating facilities while 2012-2015 counted all housing units in a participating facility.

IV. Estimate of Customers Reached 2012-2017

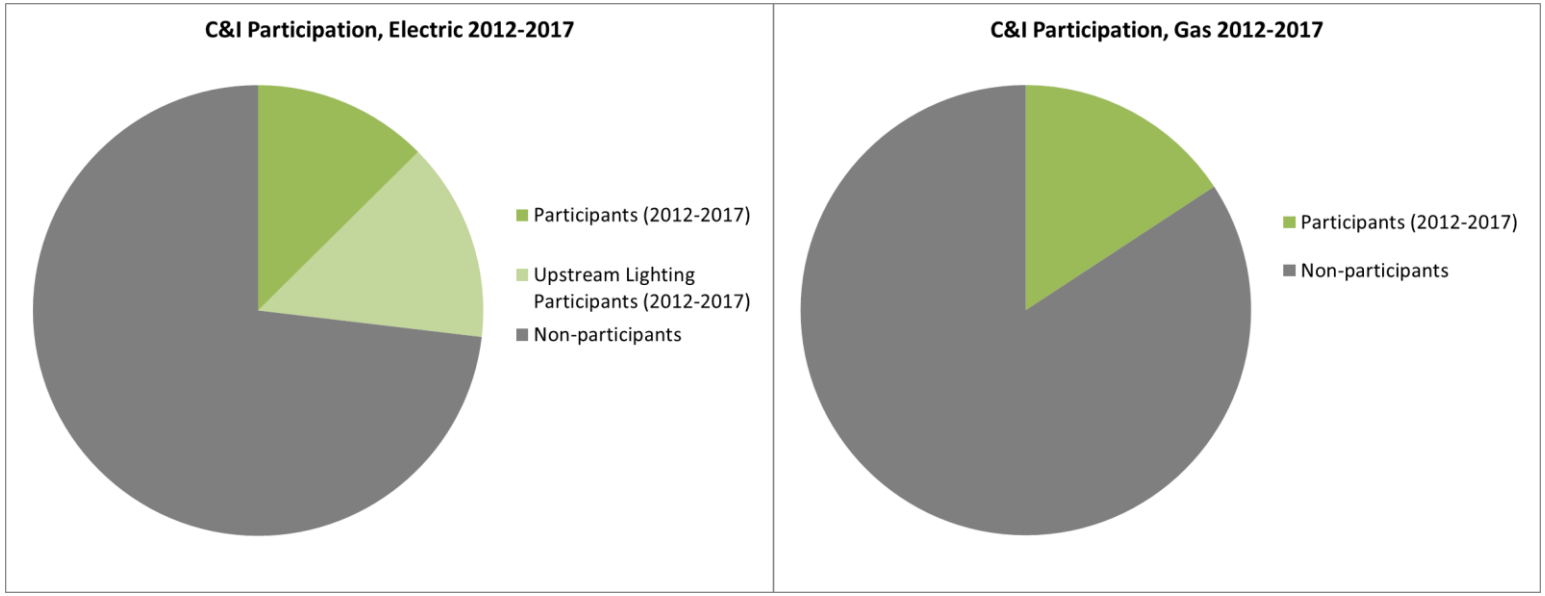
This section estimates the portion of each customer class that has participated in an energy efficiency program from 2012-2017. Figures 9 to 12 represent a visual estimate of the combination of unique participant counts from 2012-2017, plus residential new construction units, Home Energy Reports, and C&I upstream lighting. ENERGY STAR® Lighting participants are excluded from the counts because the program's broad participation among a large number of customers would overwhelm the data, making it difficult to analyze participation in other programs. Purchasing pattern research indicates that an estimated 435,656 participants purchased efficient bulbs through the program in 2017 alone. Similarly, C&I upstream lighting is also excluded from the unique participation count since the Company does not have detailed information and cannot remove overlap with other C&I programs. The Company does have customer information to remove overlap across years and includes an estimate of unique C&I upstream lighting participants in the graphs below.

The graphs show that from 2012 through 2017, 29% of electric customers and 21% of gas customers participated in National Grid's energy efficiency programs at least once. This is significant when one considers this analysis does not include data back to 2009, when energy efficiency programs under the construct of Least Cost Procurement began, and does not include ENERGY STAR® Lighting. Had this data been included, the penetration rates would undoubtedly be higher.

When Home Energy Reports and C&I upstream lighting participation is added to these counts, a total of 86% of electric customers and 74% of gas customers participated over this period. Home Energy Reports are included here because the program offers significant savings and benefits to customers as well as drives customers to participate in other energy efficiency programs.

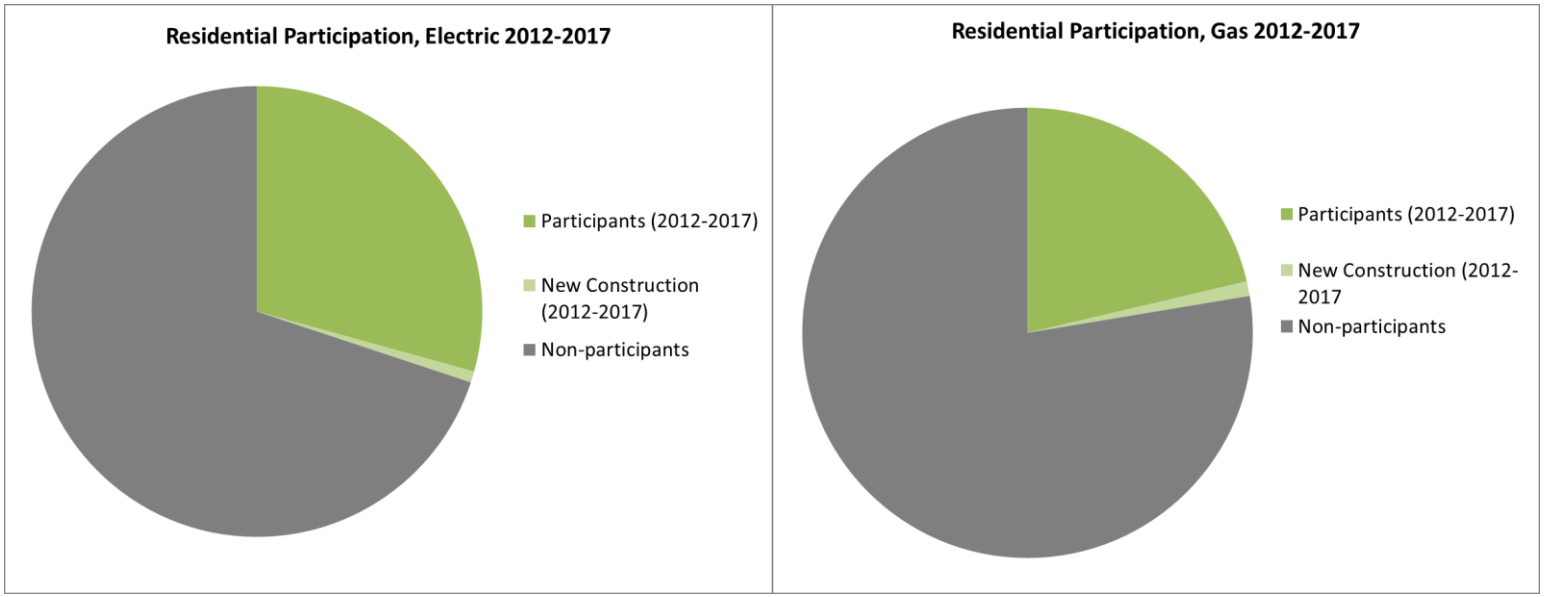
The Company will continue to conduct this analysis each year to help provide more visibility around participation levels to help gain insight into programmatic changes and improvements to reach even more customers in the future.

Figure 9. Commercial and Industrial (C&I)



*While cumulative counts remove overlap between years (2012-2017), it is not possible to remove overlap between upstream lighting and other C&I programs. Therefore there may be customers in the upstream count that are also captured in the unique participation counts for 2012-2017.

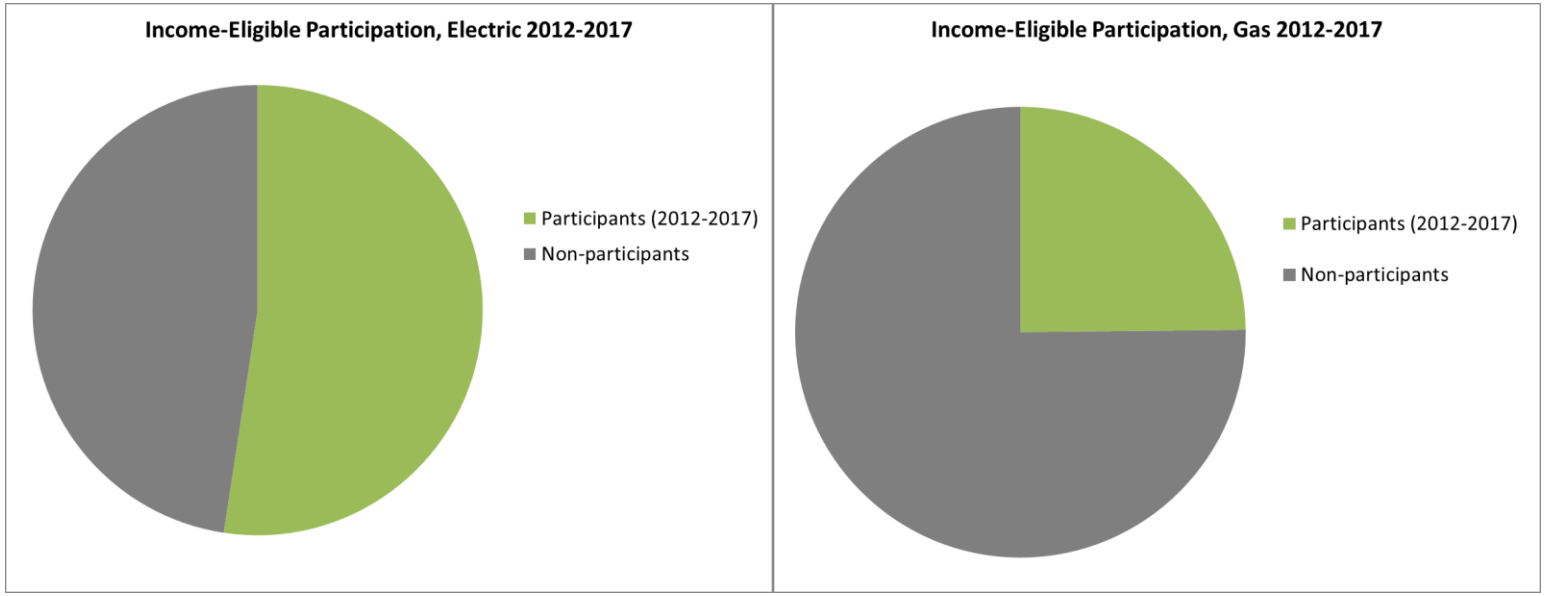
Figure 10. Residential Participation



*Does not include ENERGY STAR® Lighting and Home Energy Reports

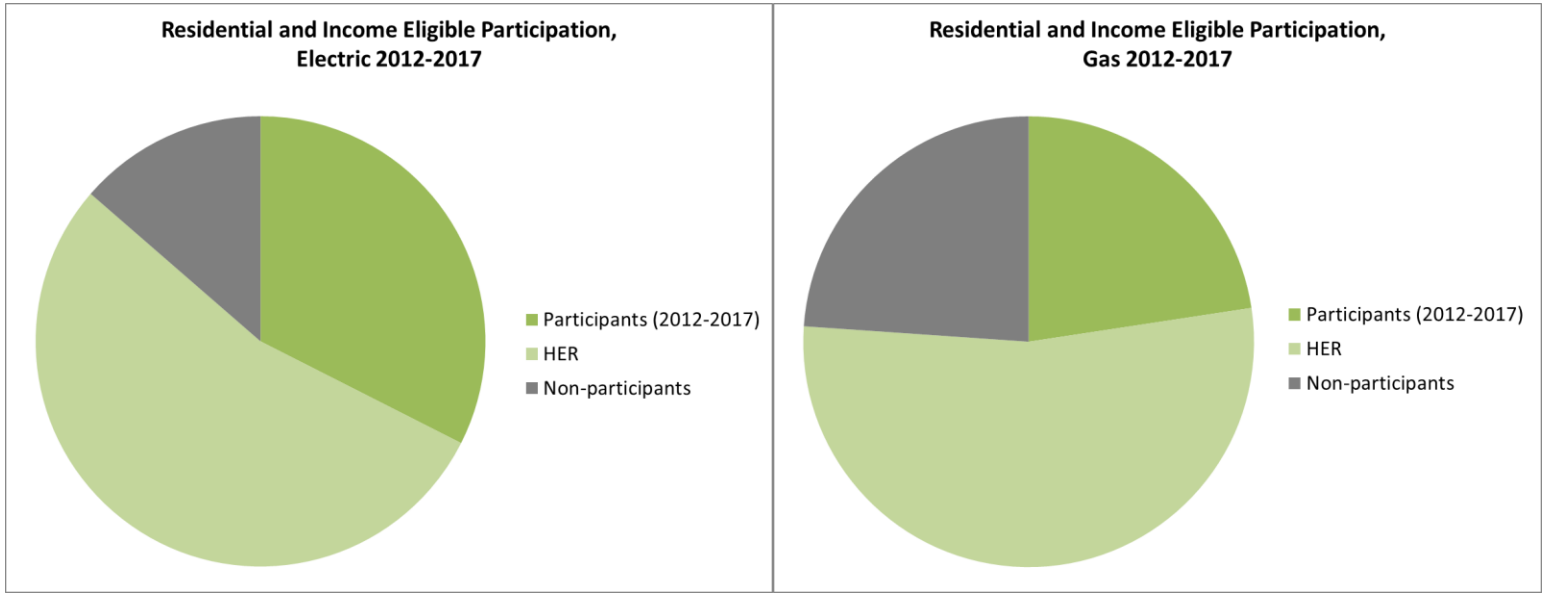
**Does not include ENERGY STAR® Products Program rebates that did not contain detailed level information

Figure 11. Income Eligible Participation



*While the Company counts Home Energy Reports, ENERGY STAR® Products, and ENERGY STAR® HVAC participation in the market rate residential sector, it's important to note that Income Eligible customers also participate in these programs as well as in the ENERGY STAR® Lighting program. Therefore, the above graphs likely under-represent the total number of Income Eligible customers served.

Figure 12. All Residential and Income Eligible Services including Home Energy Reports Program



*Home Energy Report participation has been reduced to account for estimated cross particpation with other programs based on 2017 evaluation results[2].

[2] Rhode Island Home Energy report Program Impact and Process Evaluation. Illume Advising. 2017.

Attachment 5
2017 RI Employment Rept.

Attachment 5

2017 Employment Supported by Energy Efficiency in Rhode Island Report

ANALYSIS OF JOB CREATION from 2017 Expenditures for Energy Efficiency in Rhode Island by National Grid

Prepared for National Grid

Prepared by:

Peregrine Energy Group, Inc.
2 Oliver Street
Boston, Massachusetts 02109

April 25, 2018

Table of Contents

Executive Summary

National Grid has commissioned Peregrine Energy Group, Inc. (Peregrine) to study the job impacts of National Grid's Rhode Island energy efficiency electric and gas programs and services delivered in 2017. This study meets the requirements of General Law 39-2-1.2, enacted by the Rhode Island General Assembly in 2012.

In 2017, National Grid spent a total of $117,525,163 on electric and gas energy efficiency programs and services for Rhode Island that saved a reported 232,061 annual megawatt hours (MWh) of electricity and 468,211 million British thermal units (MMBtus) of natural gas. Electric and gas energy efficiency programs and services sponsored, supported, and provided by National Grid in Rhode Island not only helped to reduce unnecessary energy use, but also saved money for customers, lowered CO2 emissions, and increased the health, comfort, and safety of homes and businesses.

In 2017, as in previous years, all programs experienced continuing strong levels of customer participation as well as demand for and acceptance of energy efficiency services. All markets continue to be positively affected by strong growth in energy efficient lighting installations, fueled by falling prices for and expanded availability and increased diversity of light emitting diode or "LED" lighting products. For electric and gas programs, all sectors exceeded energy savings and customer participation goals.[1]

That said, the focus of this study is less *what* was accomplished by National Grid programs than *how* it was done, and by whom. Although job creation is not a formal goal of National Grid's energy efficiency programs and services, employment represents a significant additional economic benefit that investments in energy efficiency contribute to Rhode Island and to the businesses participating in National Grid's programs.

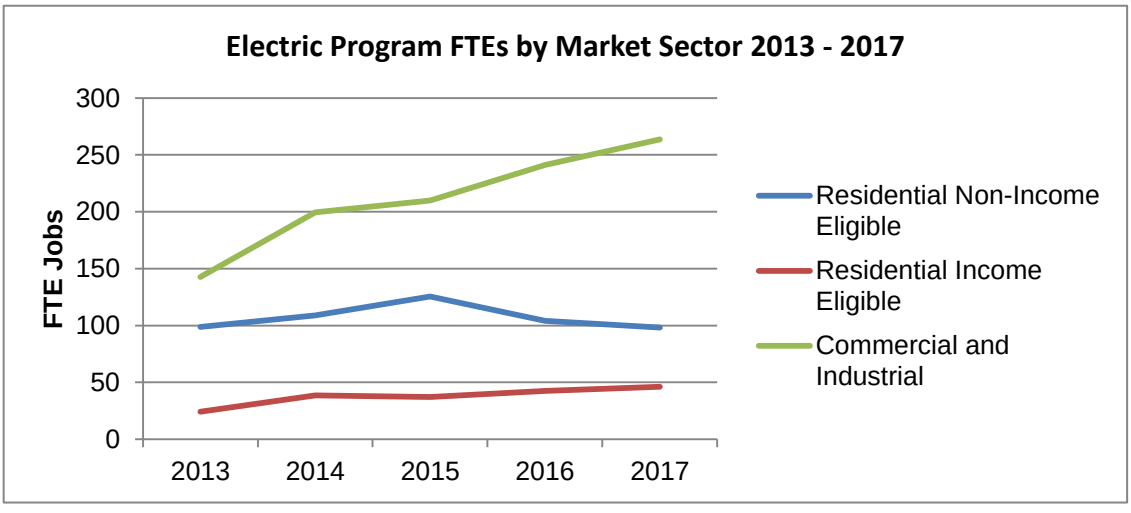
Peregrine has calculated that 726.4 full-time equivalent (FTE) workers were employed in 2017 as a result of National Grid expenditures for energy efficiency programs provided to its Rhode Island electricity and natural gas customers. For purposes of this study, Peregrine and National Grid agreed that one FTE would equal 1,760 work hours, or the total of one person working 8 hours a day for 220 work days in an average year. Because a "full-time equivalent" employee very often represents the labors of more than one person over the course of a year, the number of individual workers employed as result of Rhode Island energy efficiency programs funded by National Grid is far greater that the total number of FTEs. The vast majority of the jobs created

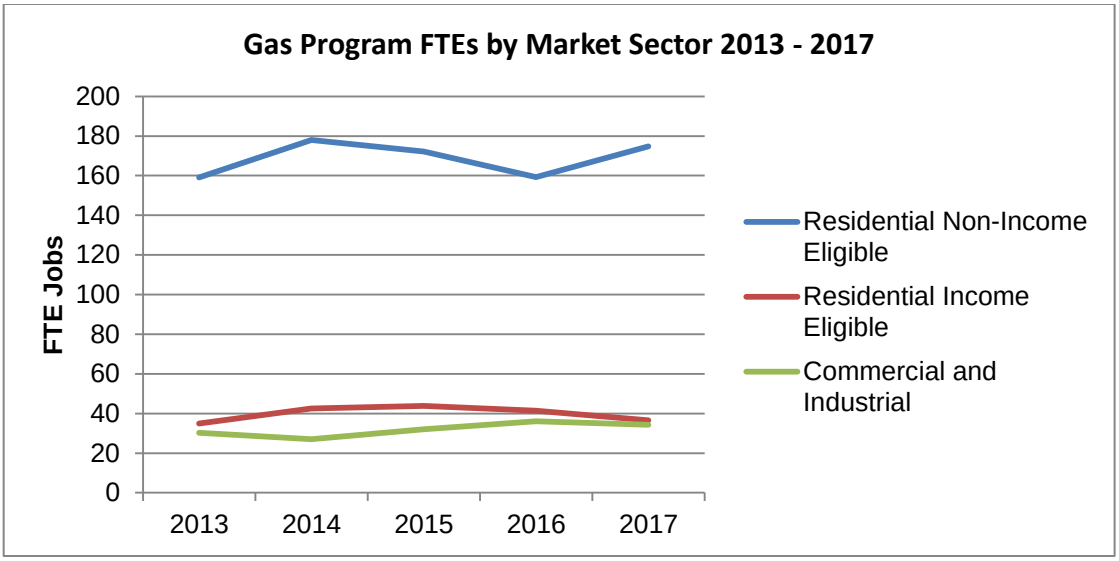
[1] National Grid Rhode Island Energy Efficiency report, Fourth Quarter 2017, February 8, 2018

as a result of energy efficiency investments were local because they were tied to installation of equipment and other materials.

Successful delivery of the 2017 energy efficiency programs to National Grid's customers has required the active involvement of a broad range of workers associated with a diverse set of businesses. Workers were employed in energy program design, management and delivery. Participating employers included program design consultants, energy program management specialists, marketing and advertising specialists, equipment manufacturers and suppliers, equipment and appliance retailers, architectural firms and developers, engineers and energy analysts, installation companies and independent contractors, plumbers and electricians, quality assurance inspection companies, utility rebate processing houses, waste material recyclers, and program evaluators, as well as National Grid. In addition, six Community Action Program agencies under contract to the state Department of Human Services delivered low-income energy efficiency services co-funded by National Grid and the federal Weatherization Assistance Program (WAP).

National Grid's programs and delivery strategies were substantively the same in 2017 as they had been in 2016, with some minor adjustments and reallocations. That said, there were material changes, up and down, in 2017 to total numbers of jobs resulting from National Grid programs targeting individual market sectors (residential, residential income eligible, and commercial and industrial). The following charts show changes to and relative contributions of the gas and electric programs by market sector to total FTE jobs identified.





Specifically, with regards to residential programs, electric program FTEs associated with program delivery declined slightly while natural gas program FTEs increased. Reductions in electric program FTEs are attributable to reduced installation of replacement oil heating systems, while gas program increases are attributable to increased numbers of weatherization projects and high efficiency heating system installations in gas heated homes. For income eligible single and multifamily residential programs, the total FTE's remained more or less the same as in 2016. Finally, for commercial and industrial retrofit programs, FTE totals associated with electric programs increased significantly, driven largely by continued conversion of all lighting sources to LED technology, while FTEs associated with the delivery of gas programs remained about the same.

Peregrine's analysis for 2017 identifies 917 companies and agencies involved in National Grid's Rhode Island programs, approximately 79% of which had Rhode Island business addresses. A list of companies involved in the 2017 Rhode Island energy efficiency programs, organized by business address, is provided at the end of this report.

These findings for 2017 confirm that, in addition to the energy savings that program participants realize, job creation remains a significant and growing benefit that National Grid's investments in energy efficiency contribute to Rhode Island's economy and directly to the Rhode Island business owners and their employees that deliver these programs and services.

Introduction

As mandated by and with the formal approval of the State of Rhode Island, National Grid provides and funds a state-approved portfolio of energy efficiency programs and services to all market sectors it serves in Rhode Island. The Rhode Island energy efficiency programs focus on both new construction and retrofit of existing buildings. These programs deliver cost-effective services and energy savings to building owners and tenants, to all-income residential customers residing in single family and multifamily buildings, to government and non-profit institutions, to small and large commercial businesses, and to manufacturers.

Overall, the 2017 program offerings and budgets have been similar to those in 2016, with some modest adjustments based on emerging opportunities and learnings. In 2017, National Grid spent a total of $117,525,163 on electric and gas energy efficiency programs in Rhode Island. These programs created 232,061 megawatt hours (Mwh) of electricity savings and 468,211 million British thermal units (MMBtus) of natural gas savings.

Job creation is not a formal goal of National Grid's energy efficiency programs and services. However, employment directly associated with National Grid programs is a significant additional economic benefit that investments in energy efficiency contribute to Rhode Island and to participating businesses. Peregrine Energy Group, Inc. (Peregrine) has prepared this study of the job impacts of National Grid's energy efficiency programs and services delivered in 2017 to Rhode Island electricity and natural gas customers. This is the fifth year Peregrine has conducted this analysis. This study meets the requirements of General Law 39-2-1.2, enacted by the Rhode Island General Assembly in 2012.

Peregrine's research objective has been, again, to count or otherwise estimate the number of jobs directly attributable to National Grid's 2017 energy efficiency programs. Unlike energy savings resulting from National Grid's energy efficiency programs that are predicted, analyzed, measured, and recorded, job impacts from energy efficiency spending are tracked, if they are tracked at all, as labor expense. Number and types of employees engaged, be they full-time or part-time, and number of hours worked to deliver programs and services are not captured and reported, except by employers themselves for payroll and business planning purposes. For this reason, calculating job impacts from the outside looking in can be more art than science.

As in previous years, Peregrine has endeavored to "follow the money" and find and count the full-time equivalent (FTE) employees engaged in all aspects of National Grid's energy efficiency programs. In many instances, if not most, each FTE attributable to a National Grid program represents the actual part-time labors of many individuals who are employed not only in delivery of National Grid programs in Rhode Island but also in other endeavors. Peregrine assumes that one FTE, regardless of job type or responsibilities, equals for purposes of this study

1,760 work hours, or the equivalent of one person working 8 hours a day for 220 work days in an average year.

As has been the case with prior years' studies, this year's study findings were developed through direct interviews with employers and through analysis of installed energy efficiency improvements that had been documented by National Grid. Peregrine interviewed managrs at energy services companies, equipment vendors, and contractors identified by National Grid for Peregrine or identified as sub-contractors by companies that Peregrine interviewed. These companies voluntarily shared information on how they staff their contracts and services. In some cases, they researched payroll records to provide payroll hours and FTE counts. Where possible, the study cites the companies that provided information to Peregrine.

Peregrine also completed a detailed review of National Grid's records of all energy efficiency measures installed in homes, apartment buildings, businesses and industrial facilities throughout Rhode Island in 2017. Peregrine then calculated typical or average labor hours required for each installed energy savings measure, based on industry standards and discussions with the contractors themselves and other experts. Peregrine has extrapolated and calculated total FTE employment from project expenditures and counts of installed measures that were reported to and by National Grid, labor rates or time required for each installation, and a standard 1,760 hours per FTE.

The report is divided into four primary sections:

1. An Efficiency Workforce Overview that describes the types of companies and workers engaged in providing efficiency program-related services and support in Rhode Island
2. The Delivery Approach used for individual programs
3. Summary Counts of FTEs with observations on their significance, with discussion of any year-to-year changes in job impacts attributable to National Grid investments comparing 2017 to previous years' study results.
4. Attachments describing Peregrine's methodology in more detail, providing Peregrine's interview guide, and listing specific companies that supplied the workforce.

Efficiency Workforce Overview

Peregrine recognizes two main categories of employers/employees that participate in the delivery of National Grid's energy efficiency programs. These categories are:

– "Program Support Service Providers" that are employers and employees involved in program planning / administration, marketing, rebate processing, and evaluation and market research.

– "Direct Service Providers" who are responsible for sales, technical assistance and training, and for supplying and installing approved efficiency measures that National Grid promotes and encourages with incentives and rebates.

Program Support Service Providers

The Program Support Services category includes:

- Companies engaged by National Grid to provide marketing, outreach, public information, and other related support services, including media placement and design of collateral marketing materials;
- Specialized firms processing and paying out rebates offered for purchase and installation of install high efficiency equipment; and
- Evaluators of the overall performance of National Grid programs against annual goals and the cost-effectiveness of specific programmatic strategies.

National Grid Employees

Program Support Services category includes all National Grid staff engaged in energy efficiency program design, regulatory matters, administrative management of contractors, marketing, and evaluation. Information provided by National Grid for 2017 identified 76,969 person-hours of time associated with Rhode Island energy efficiency program activities, equal to 38.2 FTEs, down slightly from 2016. Peregrine is reporting all National Grid FTEs as a separate category for purposes of this study and not allocating them to specific programs or groups of programs.

Support Services Contractors

Peregrine interviewed the majority of lead vendors who supported National Grid in these activities to obtain information on their roles and responsibilities in program delivery as well as FTE counts. Often, these FTEs represented the aggregation of small numbers of hours by many employees. In some instances, this was because a contractor's role may have been limited in duration and/or required contributions from a multi-disciplinary team. In other instances, it was because a vendor team with the multi-disciplinary capabilities necessary to provide effective program support, will, for reasons of cost effectiveness, deliver similar services to National Grid in multiple states, including Rhode Island; or the team supports National Grid and one or more other utility companies.

Depending on the nature of the services the vendor provided and whether the support provided could be associated with specific programs, labor hours and FTEs of Support Services Contractors were allocated across the three major program sectors (Residential, Income Eligible Residential, Commercial and Industrial), consistent with the ratios of actual 2017 gas and

electric program expenditures by program sector, or were allocated to a specific program sector.

Program Planners and Administrators

Vermont Energy Investment Corporation (VEIC) and its partners Optimal Energy (Optimal) and Energy Futures Group (EFG) continued to serve as the primary consultants to Rhode Island's Energy Efficiency and Resource Management Council (RI EERMC) in 2017. This team assisted with ongoing program planning and refinement, provided guidance for spending of Regional Greenhouse Gas Initiative (RGGI) funds for efficiency, and helped with oversight of programs offered by National Grid.

The distribution of effort on a budgeted basis by these firms in 2017 was 40% by Optimal, 38% by VEIC, and 15% by EFG. The remainder of the budget was used for additional technical assistance from two smaller firms, as well as attorney costs for filings with regulators and a website developer. Over the course of the year, thirteen staff from the primary consultant organizations, most of them market sector specialists, as well as five other supporting consultants provided services, equal to approximately 2.5 FTEs of time. Most of these firms were concurrently working in Massachusetts, providing similar support and services for energy efficiency program design and oversight of utility programming there.

Marketers

National Grid's energy efficiency marketing and advertising spend for Rhode Island in 2017 was just over $4,997,870, equal to nearly 5% of the total Rhode Island energy efficiency expenditure. Most of marketing budget spend was for media message placement, printing and direct mailing, and electronic communications.

Energy Efficiency marketing was expanded in 2017 with significant increases in advertising, additional diversification of media used, and new approaches to affect customer behaviors and secure their participation in program offerings. National Grid expanded "native advertising" that included actionable advice for customers, more aggressive targeting, and new messaging that reflected customer interests and concerns. As a result of these efforts, National Grid's commercial and industrial and residential programs had the highest customer awareness scores in 2017 that had ever been measured

Kelliher Samets Volk (KSV), a Vermont-based, regional marketing firm specializing in the utility sector, continued as National Grid's primary marketing consultant for both energy efficiency and other customer communications regarding storm outages, billing, and safety. Additional firms that provided energy efficiency marketing support for Rhode Island in 2017 included Oracle America, Inc., Innerworkings Inc., Questline Inc., and Ideas Agency Inc., among others. KSV collaborated and coordinated with Direct Service Providers to help them maintain and regulate

demand for program services. In addition to coordinating its own media placement, web-based initiatives, social media campaigns, and phone messaging with activities of other specialized marketing firms engaged by National Grid, KSV's role included developing marketing strategies and designing targeted brand marketing campaigns directed at residential, commercial and industrial customer segments. Campaigns targeted trade allies and other implementers to encourage them to use National Grid incentives and product discounts National Grid had secured to expand their business with National Grid customers.

Marketers took on a variety of specific assignments to increase general energy efficiency awareness, connect specific customer segments and sub-segments to programs and services, and engage and promote trade allies. They sent out mailings to customers and trade allies, provided telemarketing services, and disseminated emails. KSV coordinated marketing activities with National Grid's program delivery contractors to help them maintain and regulate demand for program services.

While KSV 2017 hours for energy efficiency marketing equaled only 3.1 FTEs, as many as thirty individuals at the firm touched the Rhode Island account in one way or another, including: brand and project managers; creative, art, and media directors; media and brand strategists; media buyers; a production designer, video producer, and copywriters; and the KSV executive leadership team. As in 2016, ten KSV staffers accounted for 80% of the total hours billed to Rhode Island in 2017. Among these was a three-quarter (0.75 FTE) time Senior Brand Manager based in Little Compton who focused on trade ally relationships.

Marketing FTEs calculated for Rhode Island totaled 3.9 FTEs, included the efforts of all marketing firms engaged by National Grid. Marketing FTEs have been allocated across all program sectors, consistent with the ratios of actual 2017 gas and electric program expenditures.

Rebate Processors

National Grid contacted with two firms in 2017, Blackhawk Engagement Solutions, now doing business as Hawk Incentives (Hawk), based in Texas, and Energy Federation, Inc. (EFI), based in Westborough, Massachusetts, to process rebates and incentives offered to program participants. Program participants include consumers, i.e. National Grid customers, who purchase targeted products and then apply for rebates. That said, increasingly, National Grid is offering instant rebates though point-of-sale efficiency initiatives, also called "upstream programs," described in detail in the Delivery Approach discussion below. Rebate processors also coordinate payments to equipment distributors and suppliers who support the point-of-sale programs and to equipment installers who convince customers to install a more energy efficient product.

Hawk processed incentives offered by National Grid for purchase of preferred energy efficient products installed under residential heating programs (Gas High Efficiency Heating Equipment

Rebate and Programmable & WI-FI Thermostat Offer), commercial heating programs (Commercial Kitchen Equipment Incentive and Commercial High Efficiency Heating Equipment Incentive), and the Rhode Island hot water and cooling programs (Cooling Rebate Offer and Heat Pump Hot Water Heater). Hawk scanned, data-entered, and validated rebate applications, processed payments, and cut and mailed checks. The staffing roles required included a senior manager, account management, data entry operators, quality assurance specialists, customer service, reward fulfillment staffing, and IT support. All told, Hawk required approximately 1.7 FTEs to service Rhode Island programs. Hawk also supports National Grid programs in other states and other utility clients nationwide.

EFI provided rebate processing for programs provided by National Grid in both Massachusetts and Rhode Island, with Rhode Island accounting for about 20% of the total workforce hours for this effort. Initiatives supported included Connected Solutions Demand Response, Upstream circulator pump programs, ENERGY STAR® Appliances, and ENERGY STAR® Lighting. Supporting the ENERGY STAR® Lighting program was far and away EFI's largest rebate processing effort for National Grid. Working closely with Lockheed Martin which managed ENERGY STAR® Lighting, EFI reimbursed manufacturers and others for point-of-sale discounts provided to residential customers. Rhode Island's share of the combined incentive processing operation for the two states was about 0.4 FTEs.

Evaluators

Contracted firms specializing in utility program evaluation included Navigant Consulting, Inc. DNVGL, NMR Group Inc., Illume Advising, Tetra Tech MA Inc., Opinion Dynamics Corporation, and others. Generally, outside evaluator time is attributable to specific programs serving specific market sectors. Peregrine adds the FTEs associated with those hours to individual market sector FTE totals or allocates them across gas and electric market sectors based, depending on the specific evaluation work completed. Peregrine calculated 10 FTEs associated with evaluator activity in 2017, up from 4 FTEs in 2016. This increase was proportionate to the increase in National Grid's evaluation spending in 2017, compared to 2016.

Direct Service Providers

The Direct Service Providers are specialized firms, sometimes directly under contract to National Grid, that promote and deliver the Rhode Island energy efficiency programs, contribute engineering and other technical support, and supply and install energy saving equipment.

This category includes, but is not limited to:

- **National Grid account managers.** National Grid staff provides outreach and direct technical assistance to customers, particularly for large commercial and industrial retrofits, and new construction.[2]

- **Energy services companies specializing in providing field services and installation program management.** National Grid has contracts with such firms to deliver individual programs to particular market sectors. In this capacity, they will often provide a "turnkey" service that includes: outreach and intake of customer requests; scheduling site visits; technical assistance; engineering; material and equipment installations; referrals to and engagements with trades people; administration, management and supervisions; warehouse materials purchasing and handling; quality assurance inspections; bookkeeping; and data entry and tracking.

- **Energy services companies specializing in logistical management and support.** These firms engage, manage, and coordinate product suppliers and distributors, retail store offerings, and service networks.

- **Electrical and mechanical engineers employed by contracted consulting firms.** National Grid assigns and dispatches these technical specialists to identify potential projects in customer facilities, quantify potential costs and savings, recommend actions that customers should take, and perform post-installation inspections to ensure that installed measures are performing as intended.

- **Equipment suppliers.** National Grid encourages suppliers throughout the Rhode Island service territory to market and sell targeted energy efficient equipment and approved materials directly to National Grid customers and installation contractors. Many of these suppliers participate in National Grid-sponsored "upstream" point-of-sale programs offering instant rebates.

- **Independent installation contractors.** These independent contractors, often licensed electricians and plumbers, but with other specialties as well such as weatherization, are the "feet-on-the ground" installing energy efficient equipment and approved materials for National Grid customers. Many of these installation contractors are active in more than one market sector, often as subcontractors to National Grid-designated Program leads, but also, increasingly, as self-directed installation vendors.

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[2] As noted above in the National Grid description under Program Support Services, all National Grid FTEs are reported together in a separate category for purposes of this study and not allocated to specific programs or groups of programs.

- **Quality assurance inspectors.** National Grid also contracts with inspectors that are independent of service delivery contractors who are responsible for installing equipment. The inspectors check a sample of completed installations or a sample of energy efficient equipment acquired by point-of-sale purchasers to ensure that program standards are being met, equipment is installed properly, that projected savings will likely be realized.

The role and contributions of Direct Service Providers is described in detail in the next section.

Energy Efficiency Program Delivery

National Grid designed and implemented multiple, targeted energy efficiency program delivery strategies for Rhode Island in 2017. Programs designed for each market reflect the differences in the buying habits, drivers, and technical and financial resources of each market sector (residential, residential income-eligible, commercial and industrial) and their sub-sectors. Delivery strategies will vary with fuel type (i.e. electric vs. natural gas customers), characteristics of different customer rate classes, cost and benefits to customers of different end-use technologies, and whether a program's objective is to affect energy efficiency in current operations or future energy use in new construction.

While most program strategies have remained relatively constant from 2016 to 2017, individual programs have been adjusted and tweaked in response to emerging technology, market opportunities, and observed results. Strategies that National Grid has found to be particularly successful have been expanded to additional markets and technologies. For example, point-of-purchase incentives featured in Upstream Lighting have been expanded to HVAC and pumping. Also, the more open participation by contractors in the Large Commercial Retrofit program is now a significant element of the Small Business program through the Customer Directed Option or CDO.

This section describes how National Grid delivered specific electric and gas energy efficiency programs and services in 2017 and who was responsible for program delivery.

Residential Programs

In 2017, National Grid's residential programs continued to offer a range of services and incentives to encourage residential electric and natural gas customers, be they owners or tenants, to install energy efficient equipment and materials and to operate their homes with energy efficiency in mind. Electric programs targeted all customers who used electricity, and also provided weatherization services for customers living in homes heated by electricity-powered equipment or by delivered liquid fuels (propane and fuel oil) or wood. Gas programs provided weatherization and heating system replacement support to customers d with natural gas heat.

Program services included home energy audits with installation of low-cost materials, facilitation of full weatherization (insulation and air sealing), heating system replacement with high efficiency natural gas-fired equipment, rebates through National Grid-sponsored market channels to encourage purchase of high efficiency appliances and lighting, and a number of behavioral modification initiatives. Programs sought energy use reductions by all residential customers, regardless of income level, living in single-family dwellings, 2 to 4 unit buildings, and larger multi-family residences of 5 to 20 units and 20 units or greater.

Getting customers' attention and ensuring they follow through on recommended energy saving opportunities are among the greatest challenges National Grid faces in providing programs and services to the diverse residential customers across Rhode Island. To address these challenges, National Grid's residential programs have been designed as a suite of market interventions that use mass-marketing, branding, multiple messaging, and targeted follow-up to deliver services at scale and achieve annual savings goals.

Large energy services companies who specialize in supporting utility energy efficiency initiatives are under contract to manage and deliver individual programs. The energy service company's role is, typically, to engage a wide range of players, including both buyers and sellers of energy efficiency products and services, who are needed to make a residential sector sub-market work. The company then brings these players together, provides education, training, and technical support, and facilitates investments that result in energy use reduction.

The focus of residential programs in 2017 continued to be building weatherization and heating system replacement, conversion of residential lighting to LED technology, encouraging purchase of energy efficient appliances and equipment, and promoting and facilitating more energy efficient new construction. National Grid staff described 2017 as a "strong year" for programs, which achieved most goals and significantly exceed many[3]. Marketing budgets were held steady and some financial incentive levels were increased. New outreach and sales strategies were tested, including pop-up retail in shopping malls, using Amazon and other online retailers as a source of product (e.g. wifi thermostats), adding products to upstream programs.

Delivery information on each program is detailed below.

EnergyWise Single Family (gas and electric)

In 2017, EnergyWise provided residential customers living in single-family homes (defined as 1 to 4-unit buildings) with a comprehensive energy assessment of energy use and building-specific recommendations for actions to take to increase home energy efficiency.

- Participants received technical assistance to identify how and where to improve building insulation and whether to replace appliances, heating systems, and thermostats with high efficiency models.
- As part of the energy assessment, field staff installed energy efficient lighting, low-flow showerheads, faucet aerators and smart power strips.
- They also wrote work orders for weatherization services (insulation and air sealing) by insulation contractors and for new high efficiency heating and hot water system installations

[3] Interview with National Grid Residential Lead Analyst Angela Li, February 16, 2018.

by plumbing and heating contractors, if warranted. EnergyWise would pay a significant portion of the cost of weatherization and/or a qualifying replacement heating system.
- After the installation of insulation and heating equipment, quality assurance inspections were provided to confirm that equipment was installed properly.
- The program continued to offer the Rhode Island Heat Loan, which provides 0% interest financing to eligible single-family customers to support the adoption of recommendations made during the assessment.

Delivery:

For 2017, National Grid again contracted with RISE Engineering, based in Cranston, Rhode Island, to manage and deliver the EnergyWise Single Family program. The number of RISE employees involved in the program in 2017 totaled 54.5 FTEs, up slightly from the prior year. Staff had a wide range of program roles: program managers, office and field staff supervisors, field auditors, field installers and technicians, field inspectors, intake staff and schedulers, warehouse and material management staff, electricians, quality assurance / quality control inspectors, database management, and accounting and contract oversight personnel.

RISE reported that the number of individual residential energy assessments performed through the EnergyWise Single Family program declined by 15% from 9,522 in 2016 to 8,041 in 2017, reflecting a big dip in spring/summer demand.[4] RISE had again sub-contracted for some 200 assessments and related installations to Ocean State Energy Audits in 2017, amounting to 0.7 FTEs.[5]

While 2017 audit totals decreased from 2016, completed building weatherization projects (i.e. insulation and air sealing) increased from 2,674 in 2016 to 2,732 in 2017.[6] More significant, the ratio of weatherization projects completed to assessments performed improved by 18%, improving from one weatherization project per 3.56 assessments in 2016 to one weatherization project per 2.94 assessments in 2017. RISE attributed this significant increase in the ratio of projects completed to assessments performed to a number of procedural improvements adopted by the company[7]. These included system software updates and programming improvements that generated "reminders" to staff to re-contact customers about weatherization recommendations and work orders, resulting in higher rates of customer follow-

[4] Peregrine interview with Brian Kearny of RISE Engineering, February 23, 2018

[5] Ocean State Energy Audits also provides audits for income-eligible National Grid customers on a subcontracted basis for RI Community Action Agencies.

[6] RISE provided its internal tracking data for all work performed in 2017. These numbers may differ from what is included in the National Grid 2017 Annual Report due to timing of when projects were invoiced and paid.

[7] Peregrine interview with Brian Kearny of RISE Engineering, February 23, 2018

through. RISE reported significant investment of internal time by its Database Administrator and external hours by a consulting Systems Programmer in 2016/2017 to create this capability[7]. Follow-up by staff would address customers' individual barriers to proceeding with weatherization to get them to more forward with a contractor.

26 independent insulation contractors, 17 of which were based in Rhode Island, installed the insulation and air-sealing materials recommended by RISE. Insulation crews were led by a BPI-certified crew chief. RISE received a program management fee for its services for this program that included a fee per audit, a fee per item installed by RISE staff, and a percentage mark-up (i.e. cost plus) on insulation work completed by contractors.

Independent heating contractors installed high efficiency heating system components, again using work orders generated by field auditors. 1,084 gas-fired boilers and furnaces were installed, some of which were oil to gas conversions. As part of EnergyWise Single Family, RISE helped customers to secure HEAT loans to finance the installation of these more efficient heating systems and hot water systems, as well as insulation upgrades. The HEAT Loan Program closed 388 loans for heating system replacements, of which 184 were oil to high efficiency gas system conversions. 12 electric heat pumps were also installed in 2017 as a result of program recommendations.

CMC Energy Services, Inc. provided 1,061 quality assurance (QA) inspections of a sample of EnergyWise Single Family residential customers served, up from 864 in 2016.[8] QA addressed all phases of service delivery and included review of field auditors' performance, post-audit counts of installed measures, and post-weatherization site visits to confirm proper installation technique and customer satisfaction with results. A unified workforce of 21.5 field inspectors, five of whom resided in Rhode Island, conducted single family and multifamily residential QA visits, as well as commercial program inspections, in Rhode Island and Massachusetts, supported by schedulers and data entry staff. Approximately 2.6 FTEs of this team serviced National Grid's residential programs (single family and multifamily) in Rhode Island.

EnergyWise Multifamily (gas and electric)

In 2017, EnergyWise Multifamily continued to provide comprehensive energy services to multifamily customers in buildings with five or more units, including energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting, and appliances. These same services were available to both market rate and income-eligible multifamily properties. A designated primary point-of-contact managed and coordinated

[7] Peregrine interview with Vin Graziano, President of RISE Engineering, April 12, 2018

[8] Source: CMC Energy Services, Inc.

services offered across a portfolio of National Grid programs, including EnergyWise Multifamily, Commercial Multi-family, Income Eligible Services (i.e. Low Income) for Multi-family Buildings.

Delivery:

RISE Engineering managed the EnergyWise Multifamily Program for National Grid. RISE staff included the Multi-family Operations Manager, a technical services director, field coordinators, field auditors, warehouse materials handlers, and project intake and coordination staff. In 2017, RISE added 15 additional new multifamily installers, of whom 7.5 FTEs worked on Rhode Island programs, to do select installations in 5 – 20 unit multifamily buildings.

This RISE staff also was responsible for servicing the Commercial Multifamily Program that served centrally metered properties and providing the Income-Eligible Multifamily Program described below. RISE had a combined 25 FTEs working on multifamily programs.[9]

RISE engagements in this sector resulted in a total of 15,166 units (11,279 income-eligible and 3,887 market rate units) participating in the program in 2017, compared to 5,501 income-eligible and 5,901 market rate units in 2016.[10] Market rate units were in 57 apartment sites and 86 condominium complexes. Income-eligible units were at 76 different sites.

RISE staff served as project managers for retrofit projects, meeting with building facility managers, making presentations to condominium boards and owners, and writing work orders and scopes of work (e.g. for air sealing, attic insulation, lighting fixtures, hot water systems and boiler resets, and even replacement refrigerators from retailers for low-income residents). RISE assigned weatherization, electrical, and plumbing installation work to 30 sub-contractor companies for 5-20 unit buildings. For larger buildings over 20 units, work was competitively bid out to independent contractors who installed weatherization materials (insulation and air sealing) and electrical equipment. This program was coordinated with the Commercial Multi-family program for gas heating systems in centrally gas-metered buildings.

As noted earlier in the description of the EnergyWise Single Family program, National Grid engaged CMC Energy Services to perform independent quality assurance checks on multifamily services.

[9] Source: RISE Engineering

[10] Source: RISE Engineering Multifamily Program Director

Residential New Construction (gas and electric)

The Residential New Construction program promoted the construction of high-performing energy efficient single family, multifamily, and low-income homes in both 1 to 4 unit buildings and multifamily buildings up to five stories. To that end, it educated builders, developers, housing agencies, tradesmen, designers, and code officials regarding the construction requirements, performance benefits, and costs for such buildings. Changes driven by the Residential New Construction program improve lifecycle energy performance. This is primarily attributable to better materials selection and improved construction methods. Builders say that the incremental cost of these enhancements are more than offset by faster home sales and fewer call backs to address owner concerns.

In 2013, the program had adopted a performance-based tier structure with corresponding financial incentives and began to capture savings from the Renovation/Rehabilitation and Deep Energy Retrofit offerings. This continued in 2014, 2015, 2016, and 2017, with additional incentives being offered, but with increases in performance verification as well. Incentives paid were based on the percentage of improvement over an established baseline.

Program performance in 2017 exceeded performance in 2016 according to National Grid. The number of customer homes increased by 29 %. 680 units of housing and homes received Home Energy Rating System (HERS) ratings, the highest number to date in the history of the program, up from 526 the year before.[11] 399 of these units rated in 2017 were multifamily housing units, up from 351 in 2016. The increase in multi-family units was due to increased participation of larger multi-unit properties in the program. The program team continued to bring new builders and developers into the Residential New Construction program in 2017, continuing National Grid's success with market transformation. The availability of better heat pumps continued to drive an increase in the number of electrically heated homes that met program guidelines.

Delivery:

National Grid continued to contract with CLEAResult to deliver the Residential New Construction program in 2017. CLEAResult had purchased Conservation Services Group (CSG), based in Westborough, Massachusetts, in mid-2015. CSG has delivered this program since 1998.

Total program staffing for Rhode Island totaled four (4) FTEs. CLEAResult provided program management, data management, and administrative support to this program out of its Westborough, Massachusetts, office, with three staff equal to one FTE. Three full-time staff, a field manager and two project managers based in East Greenwich (Warwick), Rhode Island,

[11] Source: CLEAResult

provided field support and project management services for individual projects. Field personnel provided trainings and reviewed plans submitted by builders and developers. A continued emphasis has been to try to reach out to all Rhode Island builders to continue to expand the impacts of the program statewide. Field staff also modeled proposed buildings and completed inspections that verified and certified that construction practices for participating buildings receiving performance ratings.

With approval from National Grid, Peregrine has not included labor hours associated with any new construction affected by the program, beyond the hours for program implementation services provided by CLEAResult. While incentives offered by National Grid influence the installation of more efficient materials and products in a new home, such installations do not substantially increase total labor hours. The labor needed to construct a high-efficiency home is more or less the same as for buildings that meet current code requirements. In addition, these new homes would likely have been built without the intervention and support of the program, even though they would not achieve the same standards for efficiency in their design and function. Therefore, no construction labor component is counted for purposes of this study.

Residential Codes and Standards Initiative

The Codes and Standards Initiative has been the complement to the New Construction program, providing information, training, and technical support to the construction / design community and to code officials in municipalities to increase code compliance. National Grid's goal has also been to promote advanced and stretch codes like the Rhode Island Green Construction Code so that new construction is mandated to meet higher standards for energy efficiency performance.

The Rhode Island Building Commission had anticipated adopting a new energy code in 2016, but the Office of Regulatory Reform requested that all sections of the building code undergo an economic analysis. This has resulted in a delay in adoption of the new energy code. While the energy code was reviewed first and successfully passed the economic test, review of the remainder of the code remains ongoing, was not completed in 2017, and now is projected for formal adoption in 2018. National Grid had planned to support trainings concerning the new energy code in 2017, but that effort was put off until the code is fully adopted. Instead, training in 2017 continued to focus on areas of the existing code where compliance has been most problematic.[12]

[12] Source: CLEAResult

Delivery:

National Grid contracted with CLEAResult in 2017 to lead this initiative in parallel with the Residential New Construction program it also manages. Altogether, staffing, including the program manager, a trainer/technical support specialist, and a logistics and administrative coordinator totaled one (1) FTE for Rhode Island. CLEAResult coordinated and conducted 15 residential trainings in 2017, lasting from 1.5 to 3 hours and targeting HVAC contractors, architects, builders, and code enforcement officials.[13] In addition, trainers delivered nine commercial classroom trainings. Two subcontractors assisted with these trainings: Energy Resource Solutions from Andover, Massachusetts, and Steven Turner, Inc. from Providence, Rhode Island. CLEAResult also fielded circuit riders to provide on-site technical assistance to developers and municipalities as needed.

Residential Home Energy Report Program (gas and electric)

National Grid began offering Home Energy Reports (HER) to all residential customers in April 2013 as the first statewide behavioral program in the country and has continued the program through 2017. The Rhode Island HER program uses historical energy usage benchmarking and social comparisons to encourage energy efficient behaviors by residential customers.

The program provides emailed reports to customers 12 times per year and mailed reports six times per year containing customer-personalized energy usage information, recommendations, and links to National Grid's other residential energy efficiency programs and services. For each mailing cycle in 2017, these data-driven, software-generated reports were sent to, on average, 283,526 residential electric and 128,835 residential gas National Grid customers in Rhode Island. The goal of reports has been to generate actual energy savings by providing "tips" for reducing energy use as well as to increase demand for and participation in other residential programs offered by National Grid. In 2017, the program expanded, providing High Bill Alerts each billing cycle to 100,000 to 150,000 customers whose monthly usage exceeded expected consumption based on modeled norms.

Delivery:

In mid-2016, Oracle Utilities, a division of Oracle America with offices in Arlington, Virginia, purchased OPower, which had originally developed the Rhode Island HER program, using proprietary behavioral analysis and energy audit software. A Northeast team, composed of six individuals, manages accounts and optimizes delivery services to clients in Rhode Island, Massachusetts, and New York. Oracle's HER service group continues to be staffed with

[13] Source: CLEAResult

behavioral scientists, marketing experts, engineers, and software product developers, with support staff, operating in cross-functional teams to develop and deliver Home Energy Reports across the U.S. Comparing program participants to a control group, Oracle estimates that their reports result in a 10% – 20% lift in program participation.[14]

Residential Community Based Initiatives (gas and electric)

Rhode Island Energy Challenge has been multi-year series of local marketing initiatives that have leveraged trusted community-based relationships in order to promote National Grid's residential energy efficiency programs in targeted communities. Community-based initiatives resemble political campaigns that are trying to get out the vote. As in past years, community-specific goals were established. Participating communities established Energy Committees made up of volunteers that would continue to serve a local champions for energy efficiency after the campaign ended. In 2017, the Challenge targeted the communities of Richmond, Cumberland, and North Kingston. While in past years, the emphasis was primarily on encouraging changes in everyday behaviors to reduce energy use while increasing awareness of National Grid programs and services, in 2017, there was a shift to quantifying increased participation in the EnergyWise Single Family program resulting from these community-based efforts. By the end of the year, 1,300 residents had signed up for EnergyWise building assessments, 20% more than the average of the three prior years. Each participating community received a $10,000 reward from National Grid for achieving its campaign goal.

Delivery:

National Grid once again contracted with Connecticut-based Smart Power to coordinate the Rhode Island Energy Challenge. Smart Power runs similar community challenges elsewhere in the United States, working with utilities, state government, and the U.S. Department of Energy. In Rhode Island, the program had two community outreach managers who worked with individual communities, and it received additional logistical support from other Smart Power staff. FTEs totaled around 1.3 staff[15].

ENERGY STAR® Lighting (electric)

ENERGY STAR® Lighting is an "upstream" or "point-of-purchase" initiative implemented jointly with other regional utilities. The program's approach is to have retailers discount lighting products that National Grid would like residential customers to purchase, providing instant rebates and special promotions at retail stores. A mail-order catalog and online store are also

[14] Source: Oracle Utilities

[15] Source: Smart Power

available to customers for lighting purchasing.

LED lighting is at the center of this program, displacing both traditional incandescent lights and the compact fluorescent lights that dominated screw-in incandescent lighting replacement in recent years. By bringing the cost of these highly efficient and long-lasting LED lamps in line with incandescent lamps at the check-out line, the program has accelerated the transformation of this market. According to National Grid, the price of LEDs reached $1 per bulb in 2017, with savings from new sales achieving 130% of goal. RISE reported that EnergyWise Single Family Program installers found it increasingly difficult to find locations to install free LEDs because participants had already purchased and installed them. Meanwhile, discounted LED products were being placed at an increasing number of smaller, independently owned, retail outlets in 2017, in addition to the major chains and big box stores that were early program participants.

Delivery:

Lockheed Martin Services, with an office in Marlborough, Massachusetts, again supported the residential consumer lighting initiative in 2017, providing direct outreach and education to both product retailers and manufacturers. Lockheed works with corporate decision makers to enlist new retailers into the program. They have monthly calls with corporate trade allies and manufacturers to facilitate getting new products to retailers and assist retailers with design and set up of displays and signage in stores.

Staffing in 2017 included two full-time Rhode Island-based field representatives and a quarter-time School Funding Coordinator. Field staff worked with retailers statewide, providing product information, training them to upsell to more efficient products, offering staff events, conducting in-store surveys and point-of-sale promotions, and helping organize school-based lighting product and power strip purchasing and distribution.

As noted earlier in this report, Massachusetts-based Energy Federation, Inc. (EFI) processed incentive payments to retailers and manufacturers that provided point-of-purchase discounts for lighting. EFI also provided a product catalogue and online store for National Grid and other regional utilities to promote and supply qualified products and to provide technical assistance to customers. This fulfillment function employed a manager, required a call center that took orders, and included warehouse personnel serving orders from Rhode Island customers, customers from elsewhere in New England, and nation-wide.

With respect to job impacts of the program, while the numbers of both participating Lockheed Martin and EFI staff are counted by Peregrine, retail outlet employees are not included in study counts since the stocking and sale of discounted LED products had no discernible incremental effect on store employment.

ENERGY STAR® Appliances (electric)

In 2017, ENERGY STAR® Appliances was again run in collaboration with other regional utilities to promote the purchase of high efficiency household appliances, including kitchen appliances, and electronics. These appliances carry an ENERGY STAR® label. The program also offered refrigerator and freezer recycling, which helped address a significant barrier to purchasing a more efficient appliance. This appliance disposal program also helped remove non-efficient units from the market (eliminating additional, older units in customer basements and garages), recycled appliance components, and captured and properly disposed of refrigerants.

Meanwhile, market transformation to more energy efficient appliances has accelerated and ENERGY STAR® has increasingly become the standard for new refrigerators. Incentives are lower compared to the cost for the next level of increased refrigerator efficiency available, and consumers are resistant to the higher purchase price. Additional utility incentives are not cost effective for many products, given the incremental savings they create. To secure additional appliance energy savings, National Grid ran a promotion in the fall, increasing refrigerator and freezer recycling incentives, that resulted in significant increases in appliance pick-ups for recycling.

Further, other consumer products like WIFI thermostats, Tier 2 Advanced Power Strips, energy efficient dehumidifiers, and pool pumps have proven to be applicable to this upstream, point-of-purchase strategy and volumes of these products sold increased in 2017.

Delivery:

As is the case with ENERGY STAR® Lighting, ENERGY STAR® Appliances is primarily a retail-store based initiative. And as was the case with ENERGY STAR® Lighting, retail outlet employees were not counted for this study since the sale of these products had no discernible incremental effect on store employment (i.e. it primarily resulted in different appliance choices by consumers). Again, as with ENERGY STAR® Lighting, Lockheed Martin Services engaged major retail outlets, providing the same support as for ENERGY STAR® Lighting. Lockheed Martin also subcontracted for disposal and recycling of replaced air conditioners and dehumidifiers.

National Grid and the other regional utilities contract with ARCA Recycling Inc. to recycle older refrigerators and freezers as part of the holistic strategy to encourage the purchase of energy efficient products. ARCA, operating in Franklin, Massachusetts, is responsible for refrigerator collection, dismemberment, and material recycling. In 2017, ARCA collected, transported, disassembled, and processed 5,578 refrigeration units from Rhode Island. The ARCA workforce included a Recycling Center Manager, 18 employees in transportation, and five warehouse employees who took apart and processed the collected appliances. ARCA estimated that 30% of the annual hours of this 24-person workforce were attributable to Rhode Island activity, based on volumes handled, equal to 7.2 FTEs.

ENERGY STAR® HVAC (gas and electric)

The Rhode Island Heating and Cooling program (formerly the High-Efficiency HVAC programs: *Gas Heat* [heating] and *CoolSmart* [cooling]) promotes the installation of high efficiency gas heating and electric cooling systems via tiered rebate levels for more efficient technologies including ductless mini-splits, heat pumps, heat pump water heaters, boilers, furnaces, Wi-Fi thermostats, boiler reset controls, and furnaces equipped with high efficiency fans. The program has provided in-depth contractor training for design, installation, and testing of high efficiency systems. Furthermore, the program provided quality installation verification training, ensuring that all equipment is properly sized, installed, sealed, and performing. In 2017, the high price point for condensing gas water heaters, their relatively low efficiency, and a lack of utility incentives for purchasing this equipment resulted in very little activity in this market. With respect to electric heating products, the volume of heat pump water heaters purchased and the installation of mini-splits providing both heating and cooling has increased.

Delivery:

Westborough, Massachusetts-based CLEAResult delivers this program, providing training, technical support, and marketing assistance to trade allies to promote electric mini-splits and higher efficiency water heating systems. Staffing associated with this program is quite modest. Lockheed Martin Services has also been involved in this program, promoting advanced thermostats and energy efficient water heaters to big box home improvement retailers.

In evaluating FTEs associated with the program, Peregrine counted the employees of vendors under direct contract to National Grid, but did not include labor associated with installation of this equipment, since it did not increase incrementally as a result of the Program.

Income Eligible Residential Programs

National Grid offers Income Eligible (low-income) programs to its electric and gas customers residing in single family (1-4 unit) dwellings and multifamily (5 or more unit) buildings or developments who are eligible for the Low Income Heating Assistance Program (LIHEAP). This target audience was already eligible to receive energy-related assistance through federal and state programs. National Grid's program strategy in this market is to support, complement, and leverage the resources and services provided by these other programs.

Specific 2017 Income Eligible Residential Programs included:

Income Eligible Single Family (gas and electric)

National Grid's Income Eligible Single Family program provides low-income customers in 1-4 unit buildings with home energy assessments, installation of energy efficient lighting, appliances,

heating systems, domestic hot water equipment, and weatherization measures. For many decades, energy services have been, and continue to be, provided to this market sector through local non-profit Community Action Program (CAP) agencies under contract to the Rhode Island Department of Human Services (DHS). These agencies deliver the federally funded Weatherization Assistance Program (WAP) and the Low Income Heating Assistance Program (LIHEAP). These services are fuel-blind and available to income-qualified gas, oil, and electric heat customers as budgets allow. Six CAP agencies provide statewide coverage to Rhode Island residents.

With the participation of National Grid in energy efficiency services delivered by the CAP agencies to this market, WAP budgets have been significantly leveraged and energy efficient installations significantly expanded. In 2017, 35 full-time staff in the six CAP agencies provided weatherization-related services across Rhode Island. Under the Income Eligible Single Family program, CAP agencies provide three types of building audits: audits focused on lighting and appliances only that install lighting products; audits providing detailed recommendations and work orders for insulation contractors, heating system installers, and fans; and comprehensive audits that do both. BPI-certified auditors complete building assessments and work orders. Special AMP (Appliance Management Program) auditors install lights and refrigerator measures.

Delivery:

In July 2013, CLEAResult, working out of offices in Providence, Rhode Island, was selected by National Grid to manage its Income Eligible Single Family program and continued in that role through 2017 when it received a new multi-year contract. CLEAResult serves as the conduit for National Grid payments to the CAP agencies and works closely with the Rhode Island DHS staff to coordinate and optimize delivery of National Grid-funded services and traditional Weatherization Assistance. CLEAResult staffing included a program manager, an installation quality assurance / quality control inspector, and administrative support.

Under CLEAResults' management, productivity and quality of service delivery to low income residents has continuously improved. CLEAResult has expanded training for current auditors, increased quality control, and improved oversight of National Grid-funded services and installations delivered through CAP agencies. The result, according to CLEAResult is "more and better work than ever." Further, CLEAResult also has connected with Technical Schools in Rhode Island to recruit new, well-trained auditors for Community Action Program agencies.

In 2017, program participants included 700 gas customers and 3,886 electric (i.e. not-gas) customers, significantly exceeding participation goals.[16] 2,581 AMP installations were provided,

[16] Interview with Laura Rodormer, National Grid Lead Analyst, February 16, 2018

up slightly from 2016.[17] CAP agencies delivering the combined National Grid program and WAP achieved weatherization (insulation and air sealing) installations for 584 National Grid gas customers and the installation of 200 high-efficiency, gas-fired heating systems. In addition, 25 electricity-heated homes and 419 oil- and propane-heated buildings received weatherization, and 271 received new oil heating systems.[18]

18 independent contractors are active in income-eligible weatherization, installing insulation and completed air sealing for the CAP agencies. Many of these contractors also are active in the EnergyWise Single Family program. Contractors are selected off a state-approved list and offer fixed pricing statewide for installed measures. Each agency had three to five insulation contractors it typically worked with. The CAP auditing staff inspects completed insulation work post-installation to ensure it was properly installed. 21 Heating system repair and replacement contractors are active in this market. Heating system upgrades are put out to bid to contractors, and heating contractors also are used for post-installation inspections. There are also two electrical contractors that are approved to repair and install bathroom fans to address humidity issues and to replace or disable antiquated knob and tube wiring (a code requirement that must be done for safety purposes before insulation can be installed in walls and ceilings).

ACTION, Inc., based in Massachusetts, manages the refrigerator replacement service provided to income eligible residential customers. This included product procurement, ordering, delivery, removal and disposing of old appliances, and conducting quality assurance surveys.

Income Eligible Multifamily (gas and electric)

Since 2013, National Grid has consolidated energy efficiency offerings for income eligible multifamily properties with five or more units into the EnergyWise Multifamily program. This suite of programs addresses both gas and electric opportunities. Comprehensive energy services available to these customers included energy assessments, incentives for heating and domestic hot water systems, cooling equipment, lighting and appliances. Services provided to income-eligible and market rate units through EnergyWise Multifamily program are tracked separately.

Additionally, and in parallel, the Residential New Construction program works with Rhode Island Housing, local housing authorities, and developers of income-eligible housing to encourage construction of energy efficient properties.

[17] Source: CLEAResult

[18] Source: CLEAResult

Delivery:

In conjunction with its delivery of EnergyWise Multifamily services, RISE Engineering, based in Cranston, Rhode Island, had primary responsibility for delivery and coordination of Income Eligible Multifamily services. RISE staff serve as project managers for retrofit projects, meeting with building facility managers and writing work orders and scopes of work (e.g. for air sealing, attic insulation, lighting fixtures, and even replacement refrigerators from retailers for low-income residents. Independent contractors installed weatherization materials (insulation and air sealing) and heating equipment components.

Support for energy efficient construction of new income-eligible units is provided by CLEAResult through the Residential New Construction program.

Commercial and Industrial Programs

In 2017, Commercial and Industrial (C&I) programs, gas and electric, continued to encourage installation contractors, both technology specialists and tradespeople, to take the lead in achieving National Grid's energy efficiency goals for large and small businesses. These C&I programs also target municipal facilities and large non-profit institutions (e.g. colleges and universities and healthcare facilities). At the same time, National Grid increasingly made use of "upstream" or "point-of sale" strategies, particularly for LED lighting, that discounted the purchase price of preferred, more energy efficient equipment to accelerate market transformation and replacement of older technology.

C&I programs differentiate between "prescriptive" and "custom" energy efficiency measures. Prescriptive measures, often lighting, qualify for pre-determined incentives or discounts from National Grid based on cost-effectiveness guidelines (e.g. hours of operation or equipment life). Custom or "comprehensive" measures are evaluated and approved for incentives based on actual total savings these often more complex measures are projected to produce. In particular, the Large Commercial and Industrial Retrofit program encourages customers and their installation contractors to incorporate or "bundle" a mix of shorter payback, more certain, energy savings measures and longer payback, more complex, energy savings measures into projects, providing enhanced incentives for more "comprehensive" or "deeper" efficiency improvement.

National Grid Senior Analyst Ben Rivers identified the following trends with respect to commercial and industrial programs targeting electricity use:

- The Upstream Lighting program, described below, with its strategy of bringing LED lighting to customers at discounted prices is cutting into customer participation in the Small Business Direct Install program and also opportunities for electrical contractors to develop

comprehensive projects for large customers. Further, this growing availability of inexpensive, long-lasting LED lighting is anticipated to result in lighting market saturation before long, likely making it more difficult and expensive to achieve electricity savings in this market in the future.

- Participation by municipalities in energy efficiency initiatives is increasing, with conversion of streetlights to LED technology a continuing part of municipal energy reduction strategies.
- Customers continue to install more combined heat and power systems, finding applications for this technology in housing complexes, hotels, and smaller industrial facilities.
- More industrial process improvements are being identified and installed through targeted industrial services, and grocery stores are continuing to opt for improvements to energy efficiency in refrigeration and controls.
- An increasing number of three-year Strategic Energy Plans for large comprehensive retrofits are being negotiated with large organizations and institutions.

Over the past five years, the delivery of C&I offerings has become increasingly "market-based", compared to residential programs (though the Small Business program, described below, uses a preferred contractor to install energy conservation measures, primarily lighting, at a heavily subsidized cost to customers, in the same way EnergyWise does in the residential market).

C&I programs are largely structured to allow and encourage independent product and service providers to market and deliver services to National Grid customers, driving sales using incentives available to them from National Grid for purchase and installation of qualifying products. This strategy enables customers to work within existing contractor relationships to receive program incentives, and likewise allows contractors to work within existing customer relationships to identify opportunities for installing energy efficient equipment that National Grid wants to promote. It also meant that multiple vendors can compete for a customer's business, while assuring the customer that they could bring the same National Grid incentives. From both a jobs and a savings perspective, this has resulted in significantly increasing numbers of energy services businesses directly participating in National Grid programs and has created new and additional opportunities for diverse vendors to promote emerging energy efficient technology to new and existing clients.

Small Business Direct Install (electric)

In 2017, the Small Business Direct Install program continued to provide direct installation of prescriptive energy efficient lighting, non-lighting retrofit measures, and minor gas efficiency measures. Electric customers with average monthly demand of less than 200 kW were eligible to participate. While the program met its goal for the year due to some larger projects and continued to be driven by new opportunities to replace linear fluorescent lighting with new linear LED products, the number of participating customers has continued a downward trend.

This drop may reflect higher market saturation levels or the direct availability of discounted LED lighting to customers through the Upstream Lighting program.

Delivery:

The Direct Install program's lighting measures were delivered by RISE Engineering of Cranston, Rhode Island and sourced from one product vendor (Rexel, formerly Monro Distributing). Both RISE and Rexel were selected through a competitive bidding process.

There were 830 customers who participated in the Direct Install program in 2017, down from 1,111 customers in 2016 and from the 1,340 customers who participated in this program in 2015.[19] RISE provided turnkey installation services to this market, with annual goals, and accounted for just under 79% of customers served (down from 88% the year before) The remaining 21.5% of customers served was through the Customer Directed Option or "CDO", described below. CDO projects secured 27% of incentives provided through the Direct Install program, reflecting that these projects were larger on average than those completed by RISE.

RISE employees engaged in the Small Business program were responsible for marketing and lead generation as well as staffing an intake center that was responsible for pre-qualifying potential customers. RISE energy specialists performed field audits of customers' facilities, and data entry staff used completed audits to generate proposals for customers. Audits also resulted in referrals to the Commercial and Industrial Gas Program. RISE electricians/installers active in the Small Business program were down to 6 FTEs in 2017 from 8 FTEs in 2016, reflecting the fewer number of total projects and the increased percentage of projects performed by CDOs.

RISE maintained a supervised warehouse for material distribution and materials handlers. Electricians were both RISE employees and employees of sub-contractor Superior Electric. RISE also employed back office and accounting staff to service this program. In general, RISE employees supporting this program were salaried or hourly, while subcontractors were paid for installation work on a piece basis.

When a customer accepted a RISE proposal, a RISE project manager ensured that sufficient product was available for the installation, issued that product to the installer/electricians, and closed out the work order when the installation was completed. In 2017, total employment from RISE and its sub-contractor Superior Electric associated with the Small Business program totaled 31.5 FTEs in 2017, down from 38.9 FTEs in 2016 and from 43.5 FTEs in 2015.[20] As noted above,

[19] Source: RISE Engineering. These numbers may differ from National Grid's year-end report participation counts due to the fact that the year-end report applies net-to-gross factors and ratios to obtain an estimate of unique participants.

[20] Source: RISE Engineering

21.5% of customers (totaling 178) chose their own preferred electrician through the "Customer Directed Option" of the Small Business program.[21] Peregrine calculated that CDOs employed 9 FTEs on these projects.

As was the case with residential programs, National Grid used CMC Energy Services, Inc. to provide quality assurance inspections of Small Business projects. Field inspectors conducted QA visits in Rhode Island and Massachusetts for the Small Business program as well as for the Large Commercial Retrofit and Upstream Lighting programs (described below), supported by schedulers and data entry staff. Approximately 2.4 FTEs of this team were engaged in National Grid's commercial and industrial programs in Rhode Island.

Large Commercial Retrofit (electric)

Large Commercial Retrofit is a comprehensive program designed to promote replacing old, but still operating, less efficient energy equipment and systems with prescriptive and custom configurations of energy efficient electric equipment. Energy efficiency improvements installed through the program include: lighting; motors and drives; heating, ventilation and air conditioning (HVAC) systems; building controls; combined heat and power systems; and street lighting.

As a retrofit program, it targeted replacement of existing equipment or reconfiguration of existing systems. All commercial, industrial, and institutional customers were eligible to participate. Participating customers tended to be larger (i.e. have a monthly demand of 200 KW or more) or were pursuing "custom" electricity saving measures not available through the prescriptive Direct Install program. As was the case for the Small Business program, National Grid paid incentives to assist with defraying part of the material and labor costs associated with installing energy efficient equipment; but incentives available through this program were generally less generous than through the Direct Install program, with customers paying a larger percentage of the installed cost of measures.

National Grid also offered engineering assistance to customers to help them identify cost-effective conservation opportunities.

Delivery:

The Large Commercial Retrofit program in 2017 continued to be primarily a market-based initiative with no formal program administrator or designated suppliers. National Grid established performance standards for energy measures and allowed customers to select suppliers and installation vendors. Again, as described above, National Grid paid incentives that

[21] Source: RISE Engineering

helped defray a portion of the material and labor costs associated with installed energy efficient equipment.

National Grid statistics for the 2017 Large Commercial Retrofit program identified 748 project applications up from 520 in 2016, for 580 individual customer account numbers, up from 394 in 2016. Installers of record for these projects, based on National Grid statistics, were National Grid-approved Project Expeditors or "PEX" (341 applications, 46%, up from 177 in 2016), other installation contractors (288 applications, equal to 39%, up from 246 projects in 2016), and the customers themselves (119 applications, 16%, up from 96 projects in 2016). It is likely that the 119 customer-installed projects also involved installation contractors though no FTEs for these projects are included in counts since installer information is not available.

National Grid's program statistics for 2017 showed that the total value of project installations performed through the electric Large Commercial Retrofit program was just over $68,518,000 (up from $40,400,000 in 2016). Of this amount, 70% of Large Commercial Retrofit projects, based on project value, were lighting retrofits (totaling almost $48,000,00, up from $27,500,000 in 2016). This figure includes custom and standard lighting installations completed, as well as municipal LED streetlight conversion projects.

Large Commercial Retrofit Installers of Record 2017

EI	**748**	
Customer	**119**	
CUSTA	24	20%
HVAC	3	3%
LIGHT	80	67%
MPS	2	2%
VSD	10	8%
Installation Contractor	**288**	
CUSTA	54	19%
HVAC	23	8%
LIGHT	178	62%
VSD	33	11%
Project Expeditor	**341**	
CUSTA	104	30%
HVAC	19	6%
LIGHT	205	60%
VSD	13	4%

A total of 14 Project Expeditors pursued, secured, managed, and installed 341 Large Commercial Retrofit projects. Per the table above, generated from National Grid project data, 205 (60%) were lighting retrofits I"LIGHT"), 19 (6%) were HVAC projects including controls (HVAC), and 13 (4%) were variable speed drives (VSD). The remaining 104 (30%) were "custom" or comprehensive projects (CUSTA), often involving multiple energy efficient technologies that could also include lighting retrofits, that received customized incentives from National Grid.

Four PEX vendors installed 301 (89%) of the 341 projects developed and installed by the PEX vendor group. Two of these same PEX, Energy Source, Inc. (with 113) and RISE Engineering (with 137), installed 73% of the total. Continuing a trend Peregrine has observed since 2013, the most aggressive of the PEXs engaged dedicated sales / project management staff to pursue potential customers, in many cases subbing out the field work to licensed electrical contractors and technology specialists who received unit-based fees for completing installations.

In addition to the Project Expediters, 108 other named Installation Contractors were active in 2017 in the Large Commercial Retrofit program, using the program to induce customers to upgrade existing systems to improve energy efficiency or to purchase and install qualifying energy efficient equipment. These vendors included general energy contractors and energy services companies, as well as purveyors of energy saving technologies, such as energy management systems, advanced lighting systems, process equipment, HVAC components, etc. Again, between them, they completed an additional 288 projects. Of these projects, 178 were for lighting (62%), 54 (19%) were "custom" projects, 33 were for variable speed drives, and 23 were HVAC projects (including energy management systems).

Finally, there were 119 projects classified as "customer-installed," two-thirds of which (80) were specifically categorized as lighting projects (LIGHT), though some of the 24 custom projects may also have included lighting. It is likely that some portion of these customer-installed projects were also completed by outside contractors, though no information was available for Peregrine to confirm that.

Upstream Lighting (electric)

National Grid's Commercial and Industrial Upstream Lighting program encourages customers to choose higher efficiency lighting products at the point of purchase. The original big idea that launched this program was the recognition that commercial customers were going to larger lighting distributors to purchase stocks of replacement lighting to have on hand as lamps burned out and for large-scale change-outs. National Grid reasoned that if a customer again purchased and installed the same product as was being replaced, this could be a major lost opportunity for efficiency improvement. But if the customer could be induced to purchase and install a more efficient product, both National Grid and the customer would realize the benefits and savings of energy use reduction.

Upstream Lighting's success has been driven by three key program design elements: first, bring the incremental cost of the more efficient National Grid-preferred lighting products available from distributors in line with now-conventional products so customers would opt for high efficiency; second, offer instant rebates by working with manufacturers and distributors to create purchase price parity at the point-of-sale and eliminate the stigma of the mail-in rebate process; and third, stipulate that the purchased products could not be purchased and stored to

replace failed lamps in the future or be resold, but must be installed immediately to generate savings for National Grid and the customer.

The rapid advent and availability of these more efficient, longer-lived, and increasingly inexpensive LED alternatives to fluorescent and incandescent lighting changed this program significantly. National Grid no longer wanted customers to install high efficiency fluorescent lamps upon burnout. LED products were now the replacement of choice.

From 2014 to 2017, 842,567 units of LED lighting were sold through the Upstream Lighting program in Rhode Island. Three market segments (education, hotel/motel, and public assembly) accounted for 50% of this volume, each sector purchasing over 100,000 units of product. For the same four-year period, a total of 384,194 units of fluorescent lighting were sold through the program.

By the beginning of 2017, fluorescent lighting was no longer available from Upstream, instead replaced by a growing range of LED products that could be installed into existing fixtures. Expanding earlier efforts, National Grid decided to drive more LED luminaire and fixture sales (e.g. stairway fixtures) that would result in additional savings by also replacing the ballasts in older fluorescent fixtures with the lower watt LED drivers in new fixtures. By 2017, a growing variety of LED-only fixtures, including ceiling troffers, were available through Upstream, and, if priced right, these products could be installed proactively to economically replace still functional lamps and fixtures.

- In 2014, 429,034 units of lighting were sold through Upstream Lighting. Of these, 261,820 (61%) were high efficiency linear fluorescent lamps (LFLs). There were also 167,214 units of LED product sold.
- In 2015, the total volume of product sold through Upstream Lighting fell to 327,420, in part due to less promotion of the program by National Grid, a drop of 24%. During that year, the number of LFLs sold fell 75,520, a drop of 71%, while sales of LEDs increased to 251,900, growing 50%.
- In 2016, 292,156 units of lighting were sold through Upstream Lighting. Of this sales volume, only 46,882 units of LFLs were sold, down 82% from 2014. LED sales through upstream represented 245,274 units of lighting, equal to 84% of total sales.
- In 2017, no new products were added to the program, LFLs were discontinued in the program and A-shaped lamp incentives were reduced. Total sales fell to 178,151. LED product sales through upstream equaled 100% of total sales. LED fixture sales totaled

35,329 in 2017, up from 33,764 in 2016. New products being added in 2018 would, the program manager predicted, create a significant sales volume lift in 2018.[22]

Delivery:

In 2017, National Grid contracted with ECOVA, who had been managing the program since its inception, to administer, support, and promote Upstream Lighting. CLEAResult purchased ECOVA in early 2018.

ECOVA had engaged manufacturers and enlisted a growing number of distributors, offering incentives from National Grid, if they would reduce list prices of specified energy efficient products to electrical contractors and businesses, all with the goal of transitioning and transforming stocking practices and customer purchasing behavior. 32 Rhode Island distributors participated in the program in 2017. ECOVA processed reimbursement of suppliers for discounts provided and managed a quality assurance process to ensure that recorded sales were legitimate. In 2017, new products continued to be added to what had been available through the program to continue to accelerate the market transformation process.

CMC Energy Services conducted inspections of 5% of sales in 2017, down from 10% in 2016. ECOVA provided monthly lists to CMC of inspection targets to confirm that purchased product had been installed.[23] Larger distributors also were audited to verify that product sold through the program was, in fact, going to the customers of record.

Reviewing records maintained by ECOVA that identified who was purchasing products from distributors, Peregrine found that both the customer of record and installation contractors were the buyers of record, indicating that installation contractors were participating in the Upstream Lighting program. It appeared that they were using the discounted pricing available from participating distributors as a tool to convince their customers to replace standard-efficiency lighting with high efficiency LED product, further driving the market transition, while marketing their services. Program data provided by ECOVA and National Grid showed that 69,789 units of product (39% of the total 178,179 units sold in 2017) were purchased by electricians, who were, presumably, installing these products at customer facilities. Further, much of the product purchased by customers required an electrician to do the installations under the electrical code.

Peregrine applied the same product-specific per-unit installed times for Upstream products sold that Peregrine uses to calculate FTEs for lighting installations by electricians under the Direct Install and Large Commercial Retrofit programs. We reasoned that, because those installation times reflected the high productivity of experienced electricians incentivized to work quickly,

[22] Source: Ecova, now CLEAResult. March 9, 2018.

[23] Source: CMC Energy Services

the FTEs we calculated for Upstream would be a conservative number that did not overstate labor hours. Using this methodology, we calculated that 12.3 FTE electricians would be needed to install the production purchased through Upstream Lighting by installation contractors. And we also determined that an additional 4.1 FTEs of electrician labor would be required to install the hardwired fixtures sold through Upstream Lighting where customers were listed as the purchasers of record.

Technical Support Services (gas and electric)

Engineering support

To further support large commercial customers, National Grid contracted with consulting engineers who could be requested by an account manager to assist a customer. Engineers would identify potential custom projects, evaluate or model the energy savings that would result, and help the customer complete incentive applications. Some of these consultants brought expertise in specialties like data center energy efficiency improvement or laboratories and clean room technology. In other situations, the customer could propose a scope of work with his own engineer that National Grid could elect to support. Support from contracted consulting engineers was available through National Grid to witness project commissioning, to confirm that the installed measures were operating and performing as anticipated, and to ensure that predicted savings would be achieved.

Energy Smart Grocer

In a similar vein, National Grid contracted with CLEAResult, through its Massachusetts office in Westborough, to offer the Energy Smart Grocer sub-program, which helped large and small supermarket chains identify and implement energy efficiency improvements. Participating customers were part of local and regional chains and secured through outreach in partnership with the RI Food Dealers Association. Working in 60 kW or larger supermarkets, CLEAResult focused on refrigeration improvement, controls, and lighting. CLEAResult employed auditors and other technical staff to identify and develop efficiency improvement projects, helped them engage contractors to complete upgrades, provided technical support as needed, and performed quality assurance inspections of installations.

In 2017, as a result of CLEAResult's efforts, 16 independent contractors engaged by customers completed 67 jobs at 33 sites for 11 customers.[24] Savings achieved were 3,274,891 kWh and over 38,000 therms of natural gas. Gas savings were in HVAC equipment operation, resulting from dehumidification and keeping cold air in refrigerated cases rather than letting it spill into

[24] Source: Peregrine interview with CLEAResult

supermarket aisles. Three CLEAResult field staff visited and worked on-site with Rhode Island retailers to develop these projects. In total, CLEAResult staff logged 2.3 FTEs providing support services, with actual installations completed with incentives from the Large Commercial Retrofit program by the 16 contractors selected by customers. Interestingly, 10 of the 11 customers participating in 2017 had participated in this program in prior years. Having seen the benefits of the program, these customers progressed to additional improvements such as adding doors to open cases, upgrading energy management systems, and replacing equipment motors.

Industrial Energy (gas and electric)

In 2017, National Grid expanded the support provided by Reston, Virginia-based Leidos Engineering, Inc. to help Rhode Island and Massachusetts manufacturers to identify and implement energy efficiency improvements in industrial processes. With offices in Framingham, Massachusetts, Leidos assisted National Grid customers to develop 66 projects for custom electric measures through the Large Commercial Retrofit Electric program and 23 projects for gas measures through the Large Commercial Retrofit Gas program. Electric savings for 2017 activity totaled over 9,000,000 kWh, 120% of program goal; gas savings total almost 621,463 therms, 245% of program goal.

Leidos provided targeted engineering support to participating customers, functioning as an owner's representative as customers developed projects with specialty vendors and contractors. A typical engagement included meetings with a customer to review existing operations, major energy uses, and current production issues. Following a guided walk-thru of the facility, Leidos engineers prepare a summary of opportunities and suggested next steps. Depending on the specific interests expressed, Leidos helped identify vendors/contractors and prepared applications for National Grid incentives. The majority of industrial projects were process-related, and, increasingly in 2017, projects used customer employees for installation and construction.

Nine Leidos staff supporting Rhode Island and Massachusetts manufacturers in 2017, up from six in 2016, indicative of the growing success of the program. Staff assisting with Rhode Island customers equaled 2.25 FTEs. According to Leidos management,[25] 40% of their compensation was performance based, making them "totally engaged" in moving projects forward.

[25] Source: Peregrine interview with Ronald Gillooly, Director/Manager, Leidos

Large Commercial New Construction (electric)

The Large Commercial New Construction program encouraged energy efficient design and construction practices in new and renovated commercial, industrial, and institutional buildings. The program also promoted the installation of high efficiency equipment in existing facilities during building remodeling and at the time of equipment failure and replacement. The program offered incentives to eliminate or significantly reduce the incremental cost of high efficiency equipment over standard efficiency equipment and provided technical support to assist customers to identify opportunities for incremental efficiency improvement in eligible buildings.

Delivery:

The New Construction program was administered and promoted internally by National Grid staff. As noted above, it offered both technical and design assistance to customers to identify opportunities for incremental efficiency improvement in new building designs and to help customers and their architects/engineers to refine their designs to capture these opportunities. Outside consultants were assigned to assist customers to identify and incorporate energy efficiency solutions into new construction designs and to complete detailed studies that model and quantify energy savings. Commissioning or quality assurance was also offered to ensure that the equipment and systems operate as intended.

For purposes of this study, only the engineering support assigned by National Grid has been counted towards the labor impacts associated with National Grid programs in 2017. As is the case with Residential New Construction, construction jobs associated with commercial new construction were not counted because National Grid's involvement primarily impacts what equipment is installed, and construction labor does not measurably increase in these projects.

Commercial and Industrial Gas Programs

Commercial and Industrial Gas programs supported installation of energy efficient gas heating and water heating systems, certain thermal envelope measures, and custom gas systems in existing buildings and in new construction. The program guidelines for measure eligibility were the same as for the Large Commercial Retrofit program and the New Construction program. All commercial, industrial, and institutional customers, large (>40,000 therms) or small (<40,000 therms), were eligible to participate.

The Commercial and Industrial Gas programs offered technical assistance to customers to help them identify cost-effective conservation opportunities and paid incentives to assist in defraying part of the material and labor costs associated with the energy efficient equipment. A retrofit measure must demonstrate that it will increase energy efficiency above the performance of the still-functional equipment it will replace. For new construction or in the case of failed

equipment, “lost opportunity” rules apply. New equipment, to be eligible for incremental incentives, must exceed the efficiency of what codes require.

Delivery:

RISE Engineering served as National Grid’s Program Administrator for gas programs. RISE employees working on this project included the director of gas program services, a program manager, who managed the project pipeline, and a project coordinator, who was responsible for customer “hand-holding” and data management as customers moved through the process. Technical staff included engineers, field staff performing audits and minor installations, and administrative personnel, and a quality assurance specialist who validated engineering work. A total of 5.4 FTEs from RISE serviced the Rhode Island program.

RISE described its role in the program as “the gears that keep moving applications forward.” In 2017, 120 Large Gas custom applications were completed and paid in Rhode Island, with an additional 160 applications handled and still being processed. RISE received leads from a variety of sources, including project expeditors, mechanical contractors, and suppliers of equipment. RISE generated a Program application and, as necessary or appropriate, reviewed the customer proposal or completed a scoping study. If the project proposed was acceptable (i.e. met National Grid’s criteria), RISE issued an offer letter to the customer authorizing the project to proceed. Customers had responsibility for arranging for and completing the installation. RISE performed a post-installation inspection and closed out the application so that the rebate could be issued. Project energy conservation measures included weatherization, controls, process automation, combustion efficiency, heat recovery, combined heat and power, steam traps, and hot water upgrades.

Employment Impacts of National Grid Programs

2017 Program Budgets and Full Time Equivalent Employment

Peregrine found that in 2017 an estimated 726.4 full-time equivalent jobs or "FTEs"[26] resulted from National Grid Rhode Island energy efficiency programs. The following table, "2017 Full Time Equivalents by Program," summarizes the estimated job impacts from the 2017 electric and gas energy efficiency programs, by program sector and by individual program. In the table, Program Support Service Provider FTEs have been allocated and integrated into individual program FTE counts and program sector FTE counts based on 2017 program expenditures. These are added to the Direct Service Provider count for each program. Smaller programs with limited FTE counts, including pilots and community initiatives were combined into the category titled "other". Community Action weatherization assistance program staff and National Grid staff are counted in the 726.4 FTE total, but presented separately in the table.

Head counts vs. FTE counts

Peregrine was not able to develop actual head counts of the individual workers who participated in delivering and supporting the 2017 National Grid programs in Rhode Island. However, Peregrine can say with confidence, based on interviews with companies directly involved in the implementation of National Grid's energy efficiency programs and though our analysis of field delivery of program services, that the number of individual workers employed in and compensated for activity that directly related to National Grid's energy efficiency programs in Rhode Island far exceeds the total FTEs.

Many companies we interviewed told Peregrine that they employed multiple individuals with specialized skills or in discrete roles who were necessary and important to delivering a comprehensive, high quality product or service; but only a portion of each employee's total annual hours were attributable to Rhode Island energy efficiency activity. Some examples:

- National Grid reported 76,969 employee hours billed against Rhode Island energy efficiency program-related accounts, equal to 38.2 FTE employees. Those hours and that FTE count represent not only the aggregate contributions of Rhode Island-dedicated employees, but also employees with system-wide or similar other-state responsibilities who contributed fractionally to the Rhode Island FTE total.

[26] Peregrine and National Grid have defined a FTE for purposes of this study as an average 1,760 annual hours of employment (or 220 total days of employment per FTE).

2017 Full Time Equivalents by Program

PROGRAMS	2017 SPEND	2017 FTES
ELECTRIC PROGRAMS		
COMMERCIAL & INDUSTRIAL (C&I)		**263.5**
Large Commercial New Construction	$ 5,183,241	2.0
Large Commercial Retrofit	$ 24,964,595	221.8
Small Business Direct Install	$ 8,184,615	39.5
Other	$ 298,557	0.2
LOW-INCOME RESIDENTIAL		**46.0**
Single family Income Eligible Services	$ 8,210,659	30.9
Income Eligible Multifamily	$ 2,858,638	15.1
RESIDENTIAL		**98.2**
Energy Wise	$ 9,371,174	65.6
EnergyStar Appliances	$ 2,307,393	10.3
EnergyWise Multifamily	$ 2,039,150	13.3
Home Energy Reports - Residential	$ 2,389,752	2.6
Residential New Construction	$ 1,142,231	2.7
Energy Star HVAC	$ 1,587,059	0.3
Energy Star Lighting	$ 8,965,913	2.4
Other	$ 1,445,258	1.0
NATURAL GAS PROGRAMS		
COMMERCIAL & INDUSTRIAL (C&I)		**34.4**
Large Commercial New Construction	$ 2,082,456	0.4
Small Business Direct Install - Gas	$ 125,010	0.8
Large Commercial Retrofit	$ 4,608,150	27.8
Commercial & Industrial Multifamily	$ 794,841	5.4
Other	$ 2,621	
LOW-INCOME		**36.5**
Single family Income Eligible Services	$ 3,925,322	29.0
Income Eligible Multifamily	$ 1,916,051	7.5
RESIDENTIAL		**174.7**
Energy Star HVAC	$ 1,584,257	0.3
Energy Wise	$ 7,742,817	154.8
EnergyWise Multifamily	$ 1,145,476	16.8
Home Energy Reports - Residential	$ 504,745	0.5
Residential New Construction	$ 920,170	2.2
Other	$ 186,923	0.1
COMMUNITY ACTION AGENCY STAFF		**35**
NATIONAL GRID STAFF		**38.2**
GRAND TOTAL		**726.4**

- National Grid's commercial and industrial customer base in Rhode Island is relatively small, and the call for engineering support is very intermittent. Further, the engineering expertise that different customers will need varies. Rather than paying engineers with a variety of skills to be available to assist customers, National Grid has entered into master services agreements with multiple consulting engineering firms from whom expert engineering can be purchased as needed. However, since business economics necessitate that these consulting engineering firms' keep their staff utilized and billable most of the time, the majority of preferred engineering firms also have other contracts. Some provide similar energy efficiency services to multiple electric and gas utility companies, in multiple National Grid-served states, to a range of non-utility clients, or to a combination of these. Other firms that address specific customer sub-sectors, manage programs and offer market-specialized engineering services in multiple utility jurisdictions. The Energy Smart Grocer program delivered by CLEAResult and the Industrial program delivered by Leidos, Inc. exemplify this dynamic. Both companies are headquartered outside of New England, and they have local offices in Westborough and Framingham, Massachusetts, respectively. Both have field staff that spent a portion of their time helping National Grid customers in Rhode Island, but supported many times that many projects for National Grid customers in Massachusetts, dispatching staff, as required, to advance individual projects.

On the other hand, for other large energy services providers whose business focus is supporting one or more of National Grid's larger, labor-intensive Rhode Island programs, the total FTE counts and the number of individual personnel contributing to those counts may be nearly equal. For example, Cranston, Rhode Island-based RISE Engineering has been the lead vendor for many of the largest programs offered in Rhode Island by National Grid, including EnergyWise Single Family, EnergyWise Multifamily, Small Business Direct Install, and the Commercial and Industrial Gas programs.

The larger size of these programs required and enabled RISE to employ full-time staff to serve in specific program roles, such as auditors and inspectors. Also, similarities between staffing needs across multiple programs, e.g. for engineering, materials handling, or accounting, allowed RISE to pool staff to provide higher levels of utilization and improved staffing economies. Additionally, similarities in technical needs between programs, e.g. for electricians, allowed RISE to employ a baseline number of full-time technical specialists, but then supplemented them on an as needed basis with sub-contracted assistance. This staffing has, in turn, also enabled RISE to be a major player as a Project Expediter in National Grid's Large Commercial Retrofit program, generating business opportunities, managing more complex installations, securing equipment and materials, and providing or contracting for installation labor. And, at the same time, as new business opportunities have emerged and been secured in neighboring states, RISE has been able to grow further, shifting specialized staff back and forth between states as demand for services dictates, while maintaining or increasing the efficiency of staff utilization and improving labor economics.

Program budgets and FTE counts

A comparison of program spending and program FTE counts in the previous table shows that the number of FTE jobs attributable to a program is not proportionate to the expenditure by National Grid on a program. Simply put, every dollar spent does not result in the same number of jobs:

- Some program expenses are less labor intensive than others (e.g. marketing and advertising vs. weatherization services)
- Some program designs are more labor intensive than others (e.g. installing LED products for businesses through the Large Commercial or Small Business programs vs. selling discounted LED products through distributors via the Upstream Lighting program)
- Certain energy savings measures are more complicated and laborious than others (e.g. one electrician working alone may install 15 LED ceiling fixtures in a day vs. a team of two may convert 20 streetlights to LED in a day).

Whether energy efficiency measures installed, on a per dollar spent basis, are more labor intensive or equipment intensive also influences the number of FTEs associated with program spending.

- Weatherization materials, for example, (e.g., cellulose for installed insulation, and caulking and foam for air sealing) to improve thermal performance and reduce air leakage in residential buildings are simple and inexpensive. Most of the cost associated with weatherization is for labor during the installation process.
- Other energy efficiency measures such as energy management controls systems, chiller and boiler replacement, or major HVAC upgrades deploy sophisticated, factory-manufactured equipment where the equipment is perhaps the greatest portion of the measure cost. While these measures often require design engineering as well as field labor to install, the considerable manufacturing labor hours is not represented in program FTE counts, so the FTEs per dollar spent is lower.

A counteracting force in terms of job creation resulting from National Grid-supported energy efficiency continues to be the importance of program cost-effectiveness. Regulators, program administrators, and consumer advocates want to increase and maximize the energy saved for each dollar spent. As noted earlier, if point-of-sale discounts through Upstream Lighting are seen as a less expensive strategy to reach certain customers, then installation-based strategies may not be used for those customers. Where installation-based strategies are preferred, National Grid will use competitive bidding where practical to secure labor vendors, requiring would-be contractors to devise strategies to “tighten their belts” and structure their workforce evermore cost effectively. Contractors are increasingly paid a fixed fee for services or compensated based on work completed, encouraging contractors to keep their actual cost of

labor lower, not only to be more competitive, but also to maximize margins. A vendor delivering a program or performing an installation that is not compensated on an hourly basis naturally looks for ways to maximize worker productivity, resulting in less labor required overall to achieve energy reduction goals and fewer FTEs for Peregrine to count.

Finally, with respect to program budgets and FTE counts, there is the reasonable question of which jobs should National Grid get legitimate credit for creating. Peregrine and National Grid agreed that jobs Peregrine should count as resulting from National Grid programs should only include jobs or work hours that meet a "but for" test, meaning that but for National Grid's intervention in the market, this work would not occur. In other words, what incremental impact does National Grid's energy efficiency programs have on total Rhode Island FTE jobs?

- The Large Commercial Retrofit program had a significant jobs impact because it convinces customers to replace still functioning equipment in an existing facility with new energy efficient equipment, requiring significant incremental expense as well as installation labor. In this case, Peregrine has counted the labor associated with installations.
- EnergyWise single and multifamily programs similarly encourage customers to replace operational heating systems with new high efficiency systems even though energy savings would not justify that decision without additional incentives. Likewise, the programs pay most of the cost of weatherization, an expense that most customers would be hard pressed to do without that incentive. In this case, Peregrine has counted program management costs and installation labor costs.
- On the other hand, Commercial New Construction had limited job impacts despite its significant budget. The New Construction program pays a customer's incremental cost of opting for higher efficiency, impacting the customer's choice of materials, equipment, and construction techniques, but not significantly increasing the amount of labor and time needed to construct the building and install equipment and systems. For this program, Peregrine counts costs and services associated with program management and engineering support to customers, but does not count the installation jobs associated with building the project or installing high efficiency equipment because those jobs would have been there regardless.
- Finally, for ENERGY STAR® Lighting, Peregrine again only counted the time associated with program management. Big box stores and other retailers are already staffed to sell lighting products. Their decision to stock LED lamps and related products does not increase the number of their sales and floor staff, and, therefore, these staff are not counted. Likewise, for Upstream Lighting, Peregrine does not include the counter staff of lighting distributors in its FTE totals.

Comparing 2017, 2016, 2015, 2014, and 2013 FTEs

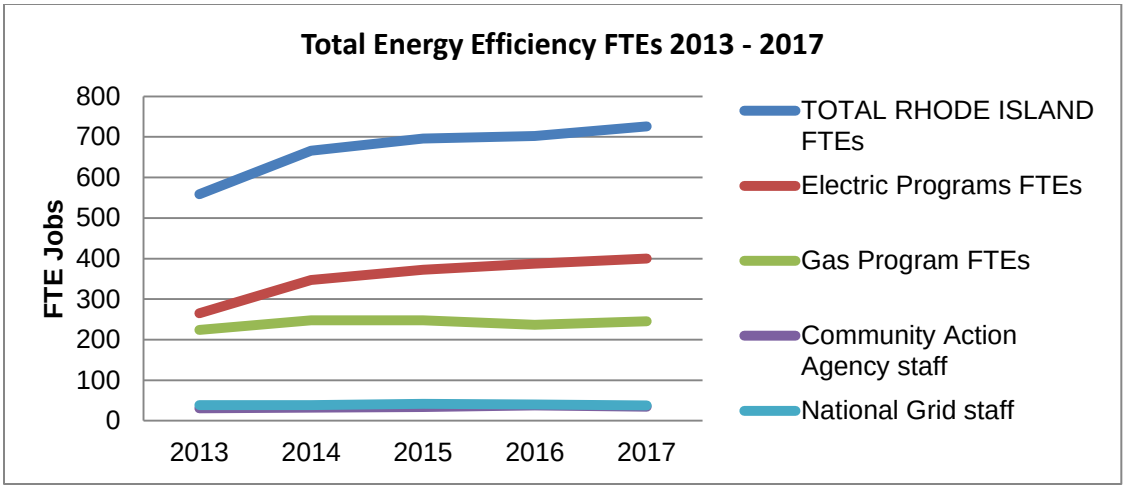
Over the past five years, National Grid's program designs have remained relatively constant, except for the expanding use of Upstream-type strategies.

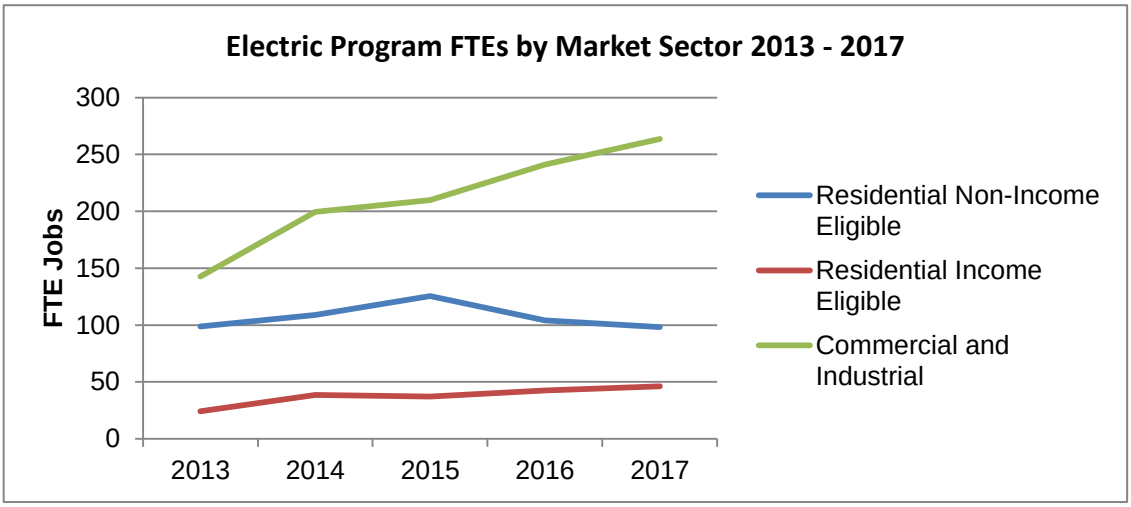
FTE Job Impacts by Market Sector: 2017, 2016, 2015, 2014, and 2013

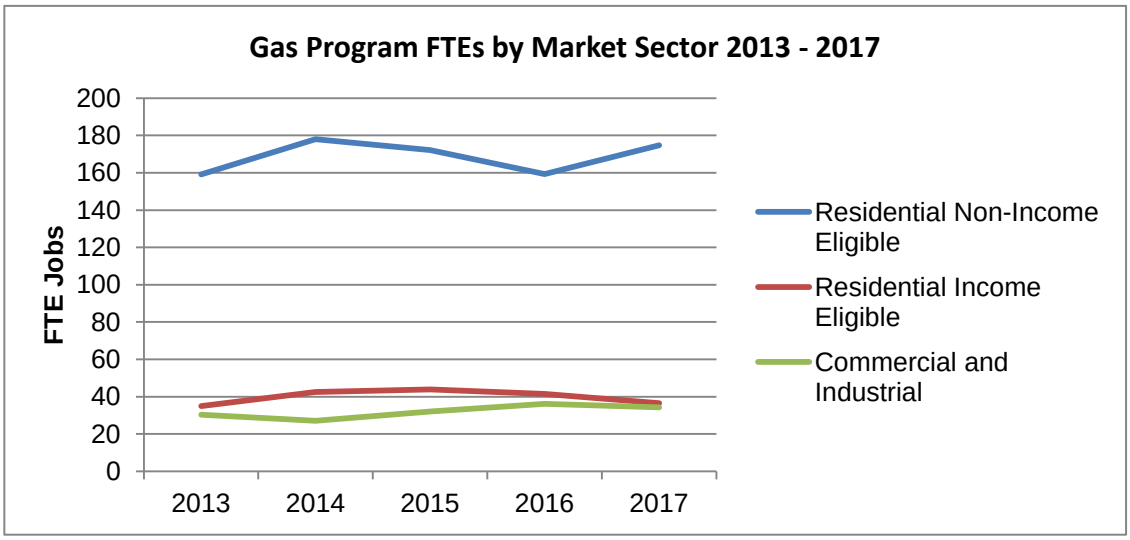
	2017 FTEs	2016 FTEs	2015 FTEs	2014 FTEs	2013 FTEs
Electric Programs					
Residential Non-Income Eligible	98.2	104.0	125.4	109.0	98.8
Residential Income Eligible	46.0	42.3	37.0	38.6	24.1
Commercial and Industrial	263.5	241.1	210.0	199.5	142.6
Gas Programs					
Residential Non-Income Eligible	174.7	159.3	172.1	178.0	159.1
Residential Income Eligible	36.5	41.4	43.8	42.5	34.9
Commercial and Industrial	34.4	36.1	32.0	27.0	30.3
Community Action Agency staff	35.0	38.0	34.0	32.5	30.7
National Grid staff	38.2	39.9	41.6	38.9	38.5
TOTAL RHODE ISLAND FTE JOBS	**726.4**	**702.2**	**695.8**	**666.1**	**558.9**

Peregrine counted or calculated 726.4 full-time equivalent jobs or "FTEs" attributable to National Grid's energy efficiency program spending in 2017. This increase over the 702.2 FTEs identified in 2016 maintains the historic trend of job impact growth since 2013. In addition to changes in the total numbers of FTEs identified in 2017 and 2016, Peregrine found there were increases and decreases in total jobs counted associated with individual market sectors.

Observed changes in year-to-year job counts mostly reflect adjustments to program budgets, new marketing initiatives that have increased customer and trade ally participation, shifts in weather and energy prices year to year, and new opportunities created by emergence of new energy efficient products.


Total Energy Efficiency FTEs 2013 - 2017
FTE Jobs
800
700
600
500
400
300
200
100
0
2013
2014
2015
2016
2017
TOTAL RHODE ISLAND FTEs
Electric Programs FTEs
Gas Program FTEs
Community Action Agency staff
National Grid staff


Electric Program FTEs by Market Sector 2013 - 2017
FTE Jobs
300
250
200
150
100
50
0
2013
2014
2015
2016
2017
Residential Non-Income Eligible
Residential Income Eligible
Commercial and Industrial


Gas Program FTEs by Market Sector 2013 - 2017
FTE Jobs
200
180
160
140
120
100
80
60
40
20
0
2013
2014
2015
2016
2017
Residential Non-Income Eligible
Residential Income Eligible
Commercial and Industrial

Residential Non-Income Eligible

Total FTEs associated with National Grid programs targeting the single family and multifamily residential sector (non-income eligible) are primarily associated with identification and installation of energy efficiency opportunities to manage heating costs. Measures installed are weatherization (insulation and air sealing) and heating equipment replacement with high efficiency equipment. Audit goals set by National Grid vary from year to year, but not so much that RISE, the Program Manager for installation programs in this market sector, needs to adjust the workforce it employs. On the other hand, weather and the cost of energy have a significant impact on requests for audits from customers and how likely it is that customers will follow through with opportunities to weatherize or replace heating equipment. A cold winter is a big driver for customers to look for ways to reduce energy expense and act on recommendations.

In 2017, delivery of EnergyWise Single Family building audits declined, dropping from 9,522 in 2016 to 8,041, reflecting a big dip in spring/summer demand. At the same time, the ratio of completed weatherization projects to building audits completed improved by 18%, reflecting increased RISE follow-up with customers who had work orders written and the institution of a much improved customer tracking system. Increases in gas FTEs are attributable to increases in weatherization of gas-heated homes and increased replacement gas heating systems with high efficiency units. Reductions in electric single family FTEs are attributable to a reduced program support for replacing older oil heating systems with new oil systems (though weatherization assistance to these customers continued unchanged). Where oil systems were converted to high efficiency natural gas equipment, FTEs associated with these installations were credited to EnergyWise gas programs.

There are also some additional FTE jobs associated with programs promoting purchase of energy efficient lighting and appliances, Home Energy Report distribution, new construction technical assistance, and others, but these are more technical support and program administration, which do not vary much year to year..

Residential Income Eligible

For the Residential Income Eligible sector, combined gas and electric FTEs stayed about the same as in 2016. National Grid has protected the budgets of these income-eligible programs and even supplemented them as additional funds were available. The electric program showed a combined net FTE increase for the combined Residential Income Eligible market, single family and multifamily, of almost 4 FTEs in 2017 compared to 2016. Gas program FTEs declined slightly due to installation of less weatherization materials in gas-heated income eligible multifamily buildings. Overall, FTEs associated with this market sector have been extremely steady over the 2013 – 2017.

Commercial and Industrial

In 2017, the Commercial and Industrial market sector showed another strong increase in FTEs associated with electric programs, up 22.4 FTEs to 263.5 FTEs, an increase of just over 9% compared to 2016. While there was a fall-off in electric installations and FTE jobs associated with the Small Business Direct Install program, the Large Commercial Retrofit electric program grew in 2017, in large part due to expanding availability of cost effective LED products and a continuing surge in LED products being installed to replace older technologies. Increases in numbers of combined heat and power projects also contributed to electric savings. Commercial and Industrial FTEs associated with gas programs continued their slight trend upward from 2013 levels, though they were down slightly from 2016. Generally, both gas and electric commercial and industrial customers have benefited from increased installation of newer, better energy management technology, which results in savings for both heating and cooling costs.

National Grid has continued to promote and expand opportunities for trade allies to initiate projects with their existing or new commercial and industrial customers, supported by direct access to National Grid incentives. In both the Large Commercial Retrofit electric program and Large Custom Retrofit gas program, installation contractors and equipment suppliers, often assisted by program facilitators engaged by National Grid (i.e. RISE Engineering, CLEAResult, and Leidos Engineering), have driven the identification, acceptance, and installation of energy efficient projects. Likewise, through Upstream Lighting, electrical contractors have been able to use the discounted pricing of products available from lighting distributers to convince customers to replace standard efficiency lighting with high efficiency product, further driving the LED market transition.

Conclusions

Peregrine anticipates that the number of FTE jobs associated with National Grid's expenditures for energy efficiency will remain stable during the short term as long as qualifying customers can be found and motivated to participate in National Grid programs. At the same time, installation jobs in market subsectors that have grown on the back of the LED revolution may begin to decline as market saturation of this technology inevitably occurs. Future energy efficiency job growth will depend on the next technology or price breakthrough.

There are also other factors in play that may dampen or increase these jobs over time.

- Markets are limited in size, and the cost of securing customers will increase as market penetration levels grow for well-established technologies, potentially causing installation companies to rethink their business strategies and retrench and shrink their workforce or exit certain markets altogether.

- Changing energy costs will affect customer behaviors, encouraging or discouraging customer interest in investing in energy efficiency improvements.
- Continuing evolution of and price drops for energy technology, as has been demonstrated by the emergence and growth of LED lighting, could create new cost-effective installation opportunities for energy efficient products. The availability of low-cost, long lasting, energy efficient LED linear lamps in the past couple of years created the opportunity to cost-effectively replace even nearly new linear fluorescents, re-opening a huge, labor-intensive lighting retrofit market that had been maxed out by the limits of fluorescent technology.
- Further program design adjustments that encourage all natural trade allies to make use of incentives available from National Grid, enabling them to sell products and services to existing and new customers, could lead to increases in FTE jobs resulting from National Grid programs and initiatives.

Of course, the level of funding available for individual National Grid's energy efficiency programs also will significantly impact the future number of FTE jobs in the energy efficiency sector. Many employers interviewed for this study stated definitively that without the program management funds they receive from National Grid and/or the availability of sufficient financial incentives from National Grid to entice customers to proceed with installations, they would likely not be doing business in Rhode Island.

Companies providing similar management services for National Grid in both Rhode Island and Massachusetts have a hedge against such changes. If Rhode Island is 20% of their business, then a 20% decline in Rhode Island funding will only result in a 4% loss of their total business. They may be able to continue working in Rhode Island on the margin. On the other hand, if a company's core business is, as with RISE, to provide field services and installations to National Grid's Rhode Island customers, a 20% reduction in program funding will not only likely result in lay-offs at RISE, but also have a downstream ripple effect with staff reductions for weatherization contractors and perhaps cutbacks for heating contractors. Further, in the case of the Large Commercial Retrofit program where much of the installation work sold by project expediters is subcontracted to electricians, funding reductions will affect electrical contractors as well.

Finally, any funding cutbacks will necessitate choices about where remaining funds should go, and these choices will certainly affect FTE jobs.

Attachment A: Methodologies used for Assessing Employment

Program Support Service Providers

National Grid

National Grid provided to Peregrine a summary of billed hours and FTE counts for employees involved with individual energy efficiency programs in Rhode Island in 2017. Responsibilities of these employees included program planning and development, program administration, regulatory affairs, marketing, evaluation, and market research. Peregrine is reporting National Grid FTEs as a separate category for purposes of this study and not allocating them to specific programs or groups of programs. For the 2018 Analysis of Job Creation, National Grid and Peregrine will examine the impacts of Net to Gross ratios on the calculation of jobs created as a result of the energy efficiency programs in Rhode Island.

Support Services Contractors

Peregrine interviewed most of the larger contractors who supported National Grid in these activities, and they described their roles and responsibilities and provided counts and hours for employees supporting National Grid in Rhode Island. Often, the FTEs Peregrine is reporting represent the aggregation of small numbers of hours by numbers of employees. Often, this was because the contractor's role was required contributions from many members of a multi-disciplinary team. Depending on the nature of the services provided and whether the support role could be associated with specific programs, time of these contractors is assigned to programs according to the overall allocation of gas and electric spend by program sector (Residential, Residential Income Eligible, Commercial and Industrial), or allocated to a specific program sector.

Direct Service Providers

Employee numbers reported by Direct Service Providers was a primary input to FTE counts. Peregrine Interviewed the major contractors directly engaged by National Grid to support or deliver Rhode Island programs to get information about type, number, and responsibilities of personnel employed. Some of these contractors provided the same services in 2017 to National Grid customers in multiple states and in some cases to multiple utilities, often using the same team of employees. Peregrine relied on their informal calculations of allocations of time to Rhode Island when formally reported hours from time cards were not available.

Where employer-sourced information on employment was not available, Peregrine relied on program records and statistics for 2017 to calculate person-hours, person-days, and ultimately annual full time equivalent field staff. Peregrine used totals for individual energy efficiency measures installed or, in some cases, total dollar value of categories of projects completed in

2017 to calculate FTEs. Depending on the information available, Peregrine would multiply the average time required (in person-hours or person-days) for each installation by the number of installations and converting the result to FTEs based on an assumed 1,760 work hours per year or 220 work days per year. These unit-based installation times were secured from representative installation companies that performed this work or from organizations that supervised installation activity. In other cases where the only information available was total project cost, Peregrine would estimate the labor cost component of projects and determine total hours required for installations using average hourly billing rates, again converting those total hours into annual FTEs. Finally, in cases where major employers could provide actual installer hours of work to Peregrine, those actual hours or days of work were used instead of calculated FTEs.

Central to these calculation methodologies was an effort to use the same approach year on year for individual programs.

Residential Programs

EnergyWise 1 – 4 Unit Residential Program

For the EnergyWise Residential program, RISE Engineering's program manager provided to Peregrine an overview of how the program functions and any changes from 2016, as well as updated FTE counts of RISE employees in various roles based on payroll tracking. Peregrine then allocated this total number of FTEs to gas and electric programs, using the relative size of National Grid electric and gas budgets as the basis for these allocations.

In 2014, RISE had shared general rules of thumb with Peregrine concerning how weatherization contractor crews and heating contractors perform site work. These typical installation scenarios were borne out by direct interviews with installation companies, as well as by interviews with Community Action Program supervisors with similar responsibilities for low-income residential services. Peregrine has continued to use these rules of thumb in 2017 to estimate numbers of FTE insulation and heating system contractor personnel that installed major energy efficiency measures.

Peregrine assumes it takes a weatherization crew made up of three insulation specialists an average of two days to complete an insulation and air sealing job. National Grid provided counts of numbers of weatherization jobs completed in 2017. Peregrine then used the total numbers of insulation jobs and the average number of man-days required for each installation to calculate a total number of FTEs (again, assuming work 220 days per person per year) providing insulation services in 1-4 unit buildings. FTEs were marked up by 20% to account for a contractor's support and management staff.

For heating system installations, we assume that it takes a two-person team four days on average to remove and replace a hydronic heating system. Peregrine secured counts of high efficiency heating systems and related equipment installed in 2017 from Hawk Incentives, which processes the incentives paid out for these installations. Since Peregrine had received differentiated counts for replacements furnaces and boilers, Peregrine assigned less installation time to replacement furnaces (due to less piping work) and adjusted time estimates accordingly. Replacement residential gas equipment was allocated to the gas program and any replacement residential oil or propane heating equipment or electric heat pump installations were treated as an expense of the electric program. We multiplied average total hours required for an installation by the total number of items installed. The total number of calculated hours was then divided by 1,760 hours to convert it to FTEs, and the FTEs were marked up by 20% to account for a contractor's support and management staff.

EnergyWise Multifamily Residential Program

As with the EnergyWise 1-4 Unit Residential Program, Peregrine interviewed RISE's program manager and was provided with staffing counts. In addition to general program supervision, responsibilities included technical leadership, auditing, field coordination and inspections, and electrical installation work. Again, RISE was able to convert staff counts to FTEs associated with this particular program. Peregrine relied on installation counts from National Grid to determine numbers of individual measures that had been installed by independent weatherization contractors and heating contractors in these buildings. As was the case for contractors installing measures in 1 to 4 unit buildings, these counts were multiplied by average times for installations in hours or portions or hours, and the resulting total hour counts were divided by 1,760 hours per FTE to arrive at annual FTE counts.

Residential New Construction
Residential Home Energy Report Program
Residential Community Based Initiatives
ENERGY STAR® HVAC Program

For each of these programs, there was no significant incremental labor impact associated with product installed or purchased because the program did not so much affect whether product was installed as it did which product was installed. Peregrine generated FTE counts through interviews with contractors that facilitated these programs and provided support services (e.g. marketing assistance, informational mailings, technical assistance, trade ally training, quality assurance inspections). These businesses provided staffing counts for 2017 from their accounting records. Total FTEs were then allocated to gas or electric based on the ratio of spending in each residential gas and electric program.

ENERGY STAR® Lighting
ENERGY STAR® Products

Both of these programs were funded solely through the residential electric budget. For both programs, there was no significant incremental labor impact associated with amount of product installed or purchased. Further, retailers' staff engaged at the point-of-sale were not counted as incremental FTEs. Peregrine generated FTE counts through interviews with individual contractors engaged by National Grid to supply services in support of the programs. These businesses provided staffing counts for 2017 from their accounting records. Total FTEs were then allocated to the residential electric spend.

Low Income Residential Programs

Income Eligible 1-4 Unit Residential

FTE counts for this program for 2017 include program management staff by the program vendor CLEAResult, Community Action Program (CAP) agency staff counts, and calculated labor required to complete installations. CLEAResult staff FTE counts came from direct interviews with CLEAResult's program manager. We determined CAP agency energy staffing for each of the six agencies operating in Rhode Island with the assistance of CLEAResult and then aggregated them to establish the statewide Community Action Agency staff count. CLEAResult also provided counts of weatherization and heating system installations completed in 2017. Peregrine used CAP agencies guidance on contractor crew sizes and installation practices to calculate the numbers of FTE installers who performed this work.

Income Eligible Multifamily Residential

Peregrine used the same approach to calculating FTEs for the Income Eligible Multifamily program as for the EnergyWise Multifamily Residential Program since both programs were administered by RISE Engineering and used the same delivery strategy.

Commercial and Industrial Programs

Small Business Direct Install Program

Peregrine used counts of employees provided by RISE Engineering, the regional program administrator, to generate FTEs for RISE staff involved in program management and measure installations and for their sub-contractors as well. No actual measure counts and calculated FTEs were used to compile job counts attributable to the work of RISE and its subcontractors, as all workers were accounted for without a piecework analysis. Peregrine also calculated additional FTEs associated with the "customer-directed option" (or "CDO") that allowed customers to use an electrician they had an existing relationship with to install program measures and receive the

same incentives as were available through RISE. These numbers were based on information from RISE about numbers of electrical contractors that were active through CDO and the numbers of customers they work with and then cross-tabulated installation time that would be required for actual items installed.

Large Commercial Retrofit Program (electric)

Installations

As described in the section on energy program delivery, the Large Commercial Retrofit program was the most market-based of all electric programs offered. Customers initiated projects, as did businesses that had products or services they were trying to sell. Installations included prescriptive lighting, motors and drives, compressors, and HVAC control measures. FTEs for installation work was calculated in a number of ways, depending on which and how much information was available to Peregrine in the data sets supplied by National Grid. For prescriptive Large Commercial Retrofit installations that were part of a specific technology group (e.g. lighting, drives), we used installed item counts to generate total installation times or total project cost to generate labor cost estimates and converted this information to FTEs. For larger, more complex custom projects, National Grid helped disaggregate total project costs into costs for sub-categories by technology. Installation labor ratios of FTEs associated with non-custom installations of specific equipment and total project costs were applied to total costs of custom measure sub-categories. Once the total dollar value of the project was determined, we could apply assumptions about the ratios of labor cost to material cost for different technologies, calculate the type and number of labor hours this represented, aggregate the total hours, and convert them to FTEs.

Upstream Lighting-related installations were rolled into the Large Commercial Retrofit FTE counts. Peregrine calculated the FTEs required for installations by electrical contractors that purchased these materials through Upstream on behalf of customers, taking counts of product purchased by the contractor, applying per unit labor times, and then calculating the total FTEs for installations. We also applied these same unit labor times to Upstream Lighting sales where customers were the purchaser of record and the item installed required an electrician to hard-wire it.

Sales and project management

As in past years, Peregrine interviewed the larger Project Expeditors to get counts of sales and project management staff they were employing in 2017 to secure and oversee projects. Similarly, Peregrine estimated the number of sales and project management personnel that were employed by other installation contractors active in Large Commercial Retrofits. We extrapolated the sales and project management staffing identified for Project Expediters to calculate numbers of like staff employed by other installation contractors. This extrapolation

used the total dollar value of Large Commercial retrofit projects installed by PEX and by other contractors under to estimate the additional sales and project management staff employed by these other installation contractors.

Engineering support

For engineering support services provided to commercial customers, Peregrine used the recorded payouts for technical assistance services provided in 2017 to calculate workforce FTEs. National Grid provided engineering services to customers through retained contractors, in particular where "custom" energy efficiency solutions required technical support to determine what could be done, what should be done, what energy savings would result, and what incentive levels were appropriate. To calculate the FTEs associated with technical assistance support provided by engineers under contract to National Grid, Peregrine took the total dollars paid out for this work and calculated how many hours of labor it represented at an assumed $120 per hour. Total hours were then converted to FTEs. Finally, for the Smart Grocer and Industrial initiatives, Peregrine interviewed and secured staff counts from CLEAResult and Leidos Engineering.

Commercial and Industrial Gas Programs

For Commercial and Industrial Gas programs managed by RISE Engineering, Peregrine interviewed RISE to secure counts of RISE employees and FTEs. A variety of contractors installed energy efficiency measures installed and much of this work was done under the Large Custom Retrofit program. Due to a lack of specific details about the cost of these projects, Peregrine relied on statistics about incentives levels paid to develop order of magnitude estimates of total project costs for labor and equipment and then conservatively calculated hours of installation labor and total FTEs assuming an average labor rate of $100/hour.

Attachment B: Interview Guide

National Grid 2017 RI Labor Study
Organization Interview Guide

Interview date: _____

National Grid Program: _____
[Program overview/Targets/How delivered/Program volumes in 2017]

Supplier company/organization [with primary address]: _____

Interviewee/position/phone/email: _____

- Company role (i.e. services provided):
- How long has company been involved in the program? ____
- Location(s) of office(s) providing services and activities: _____
- RI based staff? [Y/N] Head count? _____

Changes from prior year(s):

- Employees? [More/Less] _____
- Payroll hours? [More/ Less] _____
- Customers served? [More/ Less] _____
- Revenue? [More/ Less] _____
- Other? _____

Were you aware of the budget cap placed on EE programs by the RI Legislature in 2017 and budget cuts that took place as a result of this cap? [Y/N]

How dependent is your business on National Grid's EE programs?

What would be the impact to your business if National Grid EE programs were cut by 20%?

Additional comments:

Staff assigned:

[Title/Role/Name	Count/FTEs	Compensation (salary, hrly, piece, commission)]
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Sub-contractors used?

[Name/Address	Roles	comp type	Add'l contact info]
1			
2			
3			
4			

Are installation contractors involved in service delivery to Nat Grid customers?

[Name/Address	Roles	comp type	Add'l contact info]
1			
2			
3			
4			

Attachment C: Participating Companies

The following list includes contractors and subcontractors performing work directly for National Grid Energy Efficiency programs in 2017 that were counted in the FTE analysis and additional companies who assisted customers to secure equipment rebates, for example through the New Construction, High Efficiency HVAC programs, and upstream lighting. The list also includes the Community Action Program agencies and their subcontractors involved with the delivery of the low-income program, whether under National Grid funding or WAP/LIHEAP/ARRA funding.

The list is organized by state, with companies then listed alphabetically. Rhode Island firms are listed first. Of the 917 companies, agencies, contractors and sub-contractors listed here, 79% are either headquartered in Rhode Island, or have a physical presence in Rhode Island. Nearly 14% are Massachusetts-based companies with no physical presence in Rhode Island. Just over 1% of companies are Connecticut firms. The remaining firms have offices in the other New England states or outside of New England.

Vendor	Town	State
2 Sons Electric LLC	East Providence	RI
A & I Electric	Pawtucket	RI
A & L Plumbing Mechanical and Consulting	Westerly	RI
A & M Compressed Air Products Inc.	Providence	RI
A E Costa Electrical Contractor LLC	Warwick	RI
A Santurri Electric	East Greenwich	RI
A.T. ELECTRIC Co.	Pawtucket	RI
Accurate Trades LLC	Providence	RI
Ace Electric	Providence	RI
ACR Construction and Management Corporation	Johnston	RI
Adell Construction LLC	Cranston	RI
Advance Electrical Corporation	Providence	RI
Advanced Comfort Systems Inc.	North Smithfield	RI
Advanced Heating and Cooling	Greenville	RI
Aero Mechanical Inc.	Johnston	RI
Affordable Building and Weatherization, Inc.	East Greenwich	RI
Affordable Heating and Air Conditioning Services	North Providence	RI
Air Conditioning Services Of New England Inc.	Cranston	RI
Air Metalworks Ltd	North Providence	RI
Air Quality LLC	Warwick	RI
Air Synergy Cooling and Heating Systems Specialists	Providence	RI
Aire Serv Of Central Rhode Island	Pawtucket	RI
Airhart Electric Inc.	Coventry	RI
AJS Plumbing and Heating	North Providence	RI
Aladdin Electric Co. Inc.	Johnston	RI

Alan Menard Plumbing LLC	Pawtucket	RI
Alan Paul Electric	Warwick	RI
Albert S Koenig Electrician	Pawtucket	RI
All Electrical Solutions	Providence	RI
All Phase Heating Concepts	Woonsocket	RI
All Seasons Heating and Air Inc.	Johnston	RI
All Star Insulation	Providence	RI
All State Electric Inc	Newport	RI
All Weather Heating and Air	Providence	RI
Allen Plumbing and Heating	North Providence	RI
Allen's Electric	Woonsocket	RI
Alliance Plumbing Heating and Air Conditioning	Cumberland	RI
Allied Electrical Group	Providence	RI
Alpha Electrical Contractors Inc.	Riverside	RI
Alpha Mechanical	East Providence	RI
Al's Electric	North Providence	RI
American Development Institute Inc.	Warwick	RI
American Electric Service Inc.	Cranston	RI
American Heating, Plumbing & Sprinkler Inc.	North Providence	RI
American Home Heating and Air Conditioning Inc.	Cranston	RI
American Pride Plumbing and Heating LLC	Warwick	RI
AMERITEST	North Providence	RI
Amity Electric	Wyoming	RI
AMS Development	Portsmouth	RI
Anchor Insulation Inc.	Pawtucket	RI
Anchor Plumbing and Heating Company Inc.	Providence	RI
Andrew Cantone	Johnston	RI
Andrew R McMahon Electrician	Lincoln	RI
Angelo DeFeo	Providence	RI
Anibal J Cante	Central Falls	RI
Anthony De Angelis	Lincoln	RI
Anthony J Santurri Jr	East Greenwich	RI
Anthony Silva	Pawtucket	RI
Anthony Simas	Woonsocket	RI
Anthonys Quick Plumbing and Heating	Johnston	RI
Antonio J Improta LLC	Cranston	RI
APB Plumbing and Heating	Cumberland	RI
APCO LLC	Johnston	RI
Apple Valley Alarms	North Scituate	RI
APuzzo Plumbing and Heating	North Scituate	RI
Aquidneck Services LLC	Portsmouth	RI
AR Heating and Cooling Inc.	Cranston	RI
Arden Engineering Constructors LLC	Pawtucket	RI

Ardente Supply Co., Inc.	Providence	RI
Arkwright Inc.	Fiskeville	RI
Arthur Lettieri	Providence	RI
Arthur W Adler	Bristol	RI
Astro Electric	Middletown	RI
ATC Group Services LLC	Providence	RI
Aten Energy	Pawtucket	RI
Atlantic Plumbing and Heating	Coventry	RI
Atlantis Comfort Systems Corp	Smithfield	RI
Auburn Electric Company	Cranston	RI
Autiello Plumbing and Heating LLC	Cranston	RI
Automatic Temperature Controls	Cranston	RI
AZ Corporation	Hopkinton	RI
Azverde Electric Company	Cumberland	RI
B & B Consumers Natural Gas Service	Woonsocket	RI
B & K Electric LLC	Cranston	RI
B and M Plumbing and Heating	Warwick	RI
B Mechanical AC & Heating Inc.	Exeter	RI
B&D Boiler Removal Inc.	Pawtucket	RI
B&W Building Maintenance Electrical Contractors	North Providence	RI
Baptista Electric	Cumberland	RI
Barlow Heating LLC	Warwick	RI
Barrington Plumbing and Heating	Barrington	RI
Bashaw Electric	East Greenwich	RI
Basics Group	Providence	RI
Baum Energy	Warren	RI
Baynes Electric	Westerly	RI
Bayside Electric Company	Warwick	RI
Belcher Electric LLC	Woonsocket	RI
Beneficial Energy Products	Pawtucket	RI
Berard Heating and Mechanical	Warwick	RI
Bermudez Plumbing and Heating	Pawtucket	RI
Bert Gardiner Plumbing	Charlestown	RI
Bertrand Plumbing Inc.	Pascoag	RI
Betco Plumbing and Drain Cleaning	West Greenwich	RI
Biello Electric Co	Fall River	RI
Bill Ellis Plumbing and Heating	Johnston	RI
Bill Gornostai Electric	Warwick	RI
Bill The Plumber	North Smithfield	RI
Bills Heating Service Inc.	Warwick	RI
Blackstone Valley Community Action	Pawtucket	RI
BMB Services LLC	Cranston	RI
Bob Larisas Plumbing and Heating Inc.	Barrington	RI

Bob Martel Plumbing and Heating	Central Falls	RI
Bob Sequeira Plumbing and Heating	West Warwick	RI
Bodell Plumbing and Heating	South Kingstown	RI
Boss Heating & Cooling	Westerly	RI
Boucher HVAC Inc.	Wakefield	RI
Boulevard Plumbing and Heating	Middletown	RI
Brian Mellor	Warren	RI
Brian's Fire Alarm System Solutions, LLC	North Smithfield	RI
Brian's Heating Concepts, Inc.	Tiverton	RI
Brien Godin	Cumberland	RI
Brittain Electric Inc.	Jamestown	RI
Bruno & Son Electric Inc.	Providence	RI
BSH Heating and Appliance	Barrington	RI
Buckley Heating and Cooling	Peace Dale	RI
Burbanks Plumbing and Heating, Inc.	North Kingstown	RI
Burns Cold Heating and Air	West Warwick	RI
Burns Plumbing	Newport	RI
Butler and Sons Plumbing and Heating, Inc.	Providence	RI
BZ Electric, Inc.	West Warwick	RI
C & K Electric Company Inc.	Providence	RI
C & L Energy Corp	Cranston	RI
C and D Mechanical	Cranston	RI
C Carr Electric LLC	Cumberland	RI
C J Nemes Inc.	Woonsocket	RI
C J Pereira	Portsmouth	RI
Caiazzo Plumbing	Middletown	RI
Cal Supply Co., Inc.	Cranston	RI
Calyx Retrofit	Lincoln	RI
Capwells Heating and Air Conditioning	Greene	RI
Carbone Plumbing Heating and Air	Johnston	RI
Cardillo Electric LLC	Providence	RI
Carjon Air Conditioning and Heating Inc.	Smithfield	RI
Carl Gross	Providence	RI
Carl Pecchia Heating Contractor	Warwick	RI
Carlino Electric Inc.	Coventry	RI
Carnevale Electric	Johnston	RI
Carpentier Home Services	North Smithfield	RI
Carter Brothers Inc.	Pascoag	RI
Carter Plumbing and Heating Co.	Warren	RI
Casa Buena Builders	Providence	RI
Cassana HVAC LLC	North Providence	RI
CBRE	Providence	RI
CD Heating Inc.	Cranston	RI

Century Heating	Smithfield	RI
Charland Enterprises Inc.	Pawtucket	RI
Charles Burton	Lincoln	RI
Charles Doherty	Warwick	RI
Charlie's Heating LLC	North Kingstown	RI
Chris Electric Co.	Newport	RI
Christopher Coppolino	Warwick	RI
Cinco Plumbing and Heating Inc.	Coventry	RI
Cipriano Plumbing and Heating	Wakefield	RI
CLEAResult	Providence	RI
Clermont Mechanical Plumbing & Heating Services	Glendale	RI
Climate Controlled Systems Inc.	Cranston	RI
CM Gifford Plumbing & Heating	Little Compton	RI
CMAGS Heating and Air Conditioning	Warwick	RI
Coast Modern Construction	Providence	RI
Coastal Electric Inc.	Newport	RI
Coastal HVAC & Refrigeration	Wakefield	RI
Cobra Electric and Compaction Services, Inc.	Providence	RI
Cohen Heating Supply, Inc.	Providence	RI
Cola Plumbing and Heating Inc.	North Kingstown	RI
Collard Enterprises Inc.	Coventry	RI
Comfort Systems & Solutions Inc.	Cranston	RI
Commercial and Residential Services	Johnston	RI
Community Action Partnership of Providence	Providence	RI
Compass Electric LLC	Riverside	RI
Competitive Chimney Sweep Inc.	Woonsocket	RI
Comprehensive Community Action	Cranston	RI
Computer Sciences Corporation	Warwick	RI
Consumers Propane - Bousquet Oil	Woonsocket	RI
Conti Brothers Inc.	Providence	RI
Continental Heating and Cooling Indoor Air Quality	Johnston	RI
Cooley Incorporated	Cranston	RI
Cooper Heating and Cooling LLC	Exeter	RI
Cotoia Electric	Johnston	RI
Cox Electric LLC	Narragansett	RI
Craig R Committo Electrician	Tiverton	RI
Cross Insulation	Cumberland	RI
Crystal Plumbing and Heating Inc.	Providence	RI
CSV Mechanical Inc.	Wakefield	RI
Custom Comfort	Woonsocket	RI
CW Cummings Plumbing Co.	Coventry	RI
D & D Electric Company	East Greenwich	RI

D & D Home Industrial Services	North Providence	RI
D & E Electric, Inc.	Warwick	RI
D & J Electric Corporation	Warwick	RI
D & J Plumbing and Heating Inc.	Cumberland	RI
D & S Construction Company	Lincoln	RI
D & V Mechanical Inc.	Westerly	RI
D F S Plumbing Services	Cranston	RI
D Gomes Electric LLC	Pawtucket	RI
D.S. Plumbing and Heating LLC	Hope	RI
D'Ambra Construction Co Inc.	Coventry	RI
Danico LLC	North Providence	RI
Dave Venancio Electric	Tiverton	RI
David J O'Brian Electrician	North Kingstown	RI
David Seddon Electrician	Rumford	RI
David R Gince Electrician	Woonsocket	RI
Davidson's Plumbing and Heating	Warwick	RI
Dayco Electric	Warwick	RI
Deal Electric	East Greenwich	RI
Delmonico Enterprises -Plumbing and Heating	Cranston	RI
Desarro Electric LLC	Hope Valley	RI
Desmarais Plumbing and Heating Inc.	Johnston	RI
Dessaint Electric Co.	Warwick	RI
DeVivo Plumbing and Heating	North Smithfield	RI
Dg Electric	Woonsocket	RI
Dimery Electrical	Barrington	RI
Dion Signs	Central Falls	RI
Diorio Plumbing and Heating, Inc.	Barrington	RI
DJL Electric	Warren	RI
DLD Plumbing & Mechanical Co	Tiverton	RI
Don Jesting & Sons LLC	Middletown	RI
Donald E. Lemay Electrician	Bristol	RI
Donovan and Sons Inc.	Middletown	RI
Drain Right Sewer & Drain Cleaning Services LLC	Pawtucket	RI
Drivers Plumbing and Mechanical Inc.	Providence	RI
DS Plumbing	Coventry	RI
DSA Mechanical	Barrington	RI
DSC Heating and Air Conditioning	North Kingstown	RI
DSL Properties, LLC	North Kingstown	RI
Dual Voltage Electric LLC	Johnston	RI
Dudek Oil Co.	Warren	RI
Dupuis Energy	Pawtucket	RI
Durante Electric	Lincoln	RI
DWI Group Ltd	Johnston	RI

Dynamic Air Systems Inc.	East Providence	RI
E Whitford Plumbing Services	Exeter	RI
E.W. Audet & Sons Inc.	Providence	RI
EA Marcoux and Son, Inc.	Woonsocket	RI
Eagle Electric	Ashaway	RI
East Bay Plumbing and Heating Inc.	Bristol	RI
East Coast Electric	Johnston	RI
Eastbay Community Action	Riverside	RI
Eastern Plumbing Co Inc.	North Kingstown	RI
Eastland Electric	Lincoln	RI
Ecologic Spray Foam Insulation Inc.	Jamestown	RI
Econ Electric Contractors	Bristol	RI
Ed Beaudoin Plumbing and Heating	Cranston	RI
Eddy's Weatherization	Providence	RI
Eirich Electric	Portsmouth	RI
Electrical Concepts Inc.	East Greenwich	RI
Electrical League of RI	Warwick	RI
Electrical Wholesaler Inc.	Cranston	RI
Emergency Response Plumbing Heating and Air Conditioning	Warwick	RI
Energy Conservation Inc.	South Kingstown	RI
Energy Efficient Exteriors, Inc.	Lincoln	RI
Energy Electric Co, Inc.	Woonsocket	RI
Energy Geeks	North Smithfield	RI
Energy One Southern Mechanical	West Warwick	RI
Energy Source LLC	Providence	RI
Eurotech Climatesystems LLC	Pawtucket	RI
Eveready Electric	Barrington	RI
Evergreen Plumbing and Heating Co., Inc.	Warwick	RI
Exodus Construction LLC	Narragansett	RI
F & S Electric Inc.	Bristol	RI
F. W. Webb Company	Warwick	RI
Ferreira Electric	Bristol	RI
Feula Plumbing and Heating LLC	Johnston	RI
FG Lees and Son Plumbing and Heating	Providence	RI
First Class Plumbing	Woonsocket	RI
Five Star Plumbing and Heating	Johnston	RI
Fleet Plumbing and Heating Inc.	North Scituate	RI
Fletcher Heating Burner Repairs	Ashaway	RI
Foremost Electric Service	Cranston	RI
Foster Electric, Inc.	Tiverton	RI
Francis Heating and Hydronics	East Providence	RI
Frank Knight Plumbing and Heating	Warwick	RI

Frederick Bailey Plumber	Johnston	RI
Frontier Mechanical LLC	Providence	RI
Furtado Lighting & Design LLC	Bristol	RI
G & B Electric	Exeter	RI
G & L Electric Inc.	Woonsocket	RI
G Hill Plumbing and Heating, Inc.	Westerly	RI
Gallo Electric LLC	West Greenwich	RI
Gamache Enterprises	North Smithfield	RI
Gambit Electric Inc.	Johnston	RI
Gary Fernandes Electrician	Woonsocket	RI
Gas Doctor	Providence	RI
Gem Plumbing and Heating Services Inc.	Lincoln	RI
General Construction & Painting LLC	Pawtucket	RI
George Gaulin Electrician	Cranston	RI
Georges Electric	Warwick	RI
Gerald M Lepore Jr.	Cranston	RI
Gilbane Building Company	Providence	RI
Ginos Plumbing	Warwick	RI
Giorno Plumbing and Heating	Cranston	RI
Global Plumbing and Heating	Pawtucket	RI
GM Control Systems Inc.	North Smithfield	RI
Grace Construction LLC	Providence	RI
Granite City Electric	Pawtucket	RI
Greenwich Insulation	West Greenwich	RI
Griff Electric LLC	Portsmouth	RI
Grillo Electric	Ashaway	RI
Gronski Plumbing and Heating, Inc.	Cranston	RI
Groom Energy Solutions	Providence	RI
Guarino Power Systems LLC	Smithfield	RI
Guy Clermont Plumbing and Heating	Cranston	RI
H V Holland Inc.	Jamestown	RI
Harris Plumbing and Heating	Narragansett	RI
Haven Plumbing and Heating Co	Cranston	RI
Hawkes Plumbing and Heating Co Inc.	Chepachet	RI
HD Supply Facilities Maintenance	Warwick	RI
Heffernan Mechanical Services	Warwick	RI
Henderson Electric	Warwick	RI
Heritage Restoration Inc.	Providence	RI
HH Heating	Lincoln	RI
Hilario Quezada Electrician	Providence	RI
HK Heating Inc.	Coventry	RI
Hodson Heating and Cooling	Harrisville	RI
Holland Electric	Peace Dale	RI

Home Savers LLC	Providence	RI
Homeserve USA Energy Services LLC	Natick	RI
Hope Valley Sheet Metal Inc.	Hope Valley	RI
Horizon Solutions LLC	Smithfield	RI
Houle Plumbing and Heating	Greene	RI
Howard's Heating Service	North Kingstown	RI
Hughes Incorporated	North Kingstown	RI
Hutchins Electric	Greenwich	RI
Hynson Electrical Construction Inc.	Bristol	RI
Iasimone Plumbing-Heating & Drain Cleaning Inc.	North Providence	RI
Independent Plumbing Heating	Bristol	RI
Industrial Burner Service Inc.	Providence	RI
Innovative Plumbing and Heating Inc.	North Providence	RI
Iroquoian Plumbing and Heating	Providence	RI
Island Solar Plumbing and Heating	Jamestown	RI
It's Shocking Electric Corp.	Cranston	RI
Izzi and Sons Inc.	Providence	RI
Izzo & Sons Electric	Providence	RI
J & A Electric	Providence	RI
J & J Electric	Warwick	RI
J & M Plumbing LLC	Coventry	RI
J Joyce Plumbing and Heating Inc.	Warwick	RI
J&K Supplemental Plumbing Inc.	East Greenwich	RI
J&O Plumbing LLC	Warwick	RI
J.L. Electric	Middletown	RI
Jacob Messier	Warwick	RI
Jacobson Energy Research	Providence	RI
James Walsh	North Kingstown	RI
Janton Electric Contractors	West Warwick	RI
Jatwire Electric LLC	Tiverton	RI
Jay Almeida Electrician	Johnston	RI
JC Electric Inc.	Wakefield	RI
JD Mechanical Inc.	Greenville	RI
JD Mello Jr. Plumbing and Heating Inc.	Newport	RI
Jed Electric Inc.	Greene	RI
Jeff Berard Plumbing and HVAC	Warwick	RI
Jeffrey Reynolds	Westport	RI
JEM Construction Group LLC	North Scituate	RI
JG Home Remodeling	Woonsocket	RI
Jim Kelley Electrician	Warwick	RI
JJ McNamara Electric	Providence	RI
JKL Engineering Company Inc.	Providence	RI
JMAC Plumbing and Heating Inc.	Warwick	RI

JMC Construction	Johnston	RI
JN Jordan Plumbing LLC	Shannock	RI
JO Plumbing Septic and Drain Cleaning	Warwick	RI
Joe Chaves Heating and Plumbing	Middletown	RI
Joe Diorio Electric	Pawtucket	RI
Joe Lemay Electrician	Lincoln	RI
Joe the Plumber	Warwick	RI
Joe Vigneault Electrician	Riverside	RI
John Jackson	Cumberland	RI
John Nicholson Mechanical Contractor	North Scituate	RI
John P Keogh	West Warwick	RI
John R Bileau HVAC	Woonsocket	RI
John Simard Electric Contractor	North Smithfield	RI
Johnny Home Solutions LLC	Central Falls	RI
Johnny Mack Electric	Narragansett	RI
Johnny's Oil and Heating Inc.	Providence	RI
Johnson Brothers Heating & Air LLC	Providence	RI
Johnston Electric Inc.	North Scituate	RI
Jon Tasca Plumbing and Heating	Westerly	RI
Joseph C Grimm Plumbing & Heating Inc.	Narragansett	RI
Joseph Diorio	Pawtucket	RI
Joseph Giorno Plumbing and Heating	Cranston	RI
Joseph R Beaumier	Johnston	RI
Jouberts Heating and Air Conditioning	Warwick	RI
JP Island General Services	Middletown	RI
JS Plumbing and Heating	North Providence	RI
Juan Villanueva	Cumberland	RI
Just Heat	Portsmouth	RI
K Electric Inc.	Warwick	RI
Kafin Oil Company Inc.	Woonsocket	RI
Kelco Electric Inc.	Johnston	RI
Kelly Electric Inc.	Cumberland	RI
Kens Heating	Providence	RI
Kevin Messier Electrical	Cumberland	RI
Kevin's HVAC Installation and Repair	Bristol	RI
Kimberly Construction	North Smithfield	RI
Kirkbrae Electric	Lincoln	RI
Kirwin Plumbing	Newport	RI
KME Electric, Inc.	Woonsocket	RI
Koolco Inc.	Wakefield	RI
Kwik Plumbing and Heating, Inc.	Johnston	RI
L & M Construction & Realty, LLC	Cranston	RI
L J Giorgi Plumbing and Heating Inc.	North Providence	RI

L&B Remodeling	North Providence	RI
LAD Electric LLC	Providence	RI
Lamplighter, Inc.	Little Compton	RI
Landry and Martin Oil Co Inc.	Pawtucket	RI
Lang Plumbing and Heating	North Scituate	RI
Lawrence Air Systems Inc.	Barrington	RI
Lawrence Ashley	Barrington	RI
Leidos Engineering	Newport	RI
Lester Parente	Chepachet	RI
Leveille Electric	Smithfield	RI
Lima Construction	Pawtucket	RI
LJ Giorgi Plumbing and Heating, Inc.	North Providence	RI
Lombardo Electric Company	Warren	RI
Louie Electric & Son	Providence	RI
Lubera Plumbing	Coventry	RI
Luke Beaudreault Plumbing and Heating	North Smithfield	RI
Luso Plumbing and Heating Inc.	Cumberland	RI
M & M Electric Inc.	Providence	RI
M and M Mechanical	Richmond	RI
Madden Electric	Little Compton	RI
Mador Electric Inc.	Providence	RI
Magnetic Electric Inc.	Warwick	RI
Main Street Plumbing LLC	Pawtucket	RI
Malone Plumbing and Heating Inc.	Cranston	RI
Map Electric	Woonsocket	RI
Marcaccio Electric LLC	North Providence	RI
Marcel Multi Services	Pawtucket	RI
Marinelli & Sons Electric	West Kingston	RI
Marios Reconditioned Appliance Inc.	Woonsocket	RI
Marisa Desautel	Providence	RI
Mark Hartman	Cranston	RI
Marte Construction	Warwick	RI
Martel Plumbing and Heating	Lincoln	RI
Mastro Electric Supply Co Inc.	Providence	RI
Mastrocinque and Sons Plumbing and Heating LLC	Portsmouth	RI
Matthew Fitts Electrical	Greeneville	RI
Matthew A Marchetti	Cranston	RI
Matts Mechanical	Greenville	RI
Mazza Construction	Pawtucket	RI
McCormick Electrical	North Kingstown	RI
McDonough Electric LLC	West Warwick	RI
Mcs Electric Inc.	Portsmouth	RI

MD Heating and Air Conditioning LLC	North Providence	RI
Mechanical HVAC Systems Inc.	Wakefield	RI
Menard Electric	Manville	RI
Meryl Cohen	Smithfield	RI
Metro Electric	Woonsocket	RI
MH Electric	Cranston	RI
Michael - Rae Design LLC	Wyoming	RI
Michael Bowry	Cranston	RI
Michael Chace Electrician	Johnston	RI
Michael Cozzens	Saunderstown	RI
Michael Faiella	Newport	RI
Michael Fox Mechanical	Riverside	RI
Michael Freitas Plumbing and Mechanical	Pascoag	RI
Michael Principe	Cumberland	RI
Michael Zincone Heating and Air Condition	Warwick	RI
Michael R Lafleur	Smithfield	RI
Micheletti Oil Services Inc.	Johnston	RI
Midstate Heating and Cooling	Hope Valley	RI
Mikes Plumbing Service	Rumford	RI
Miller Mechanical Inc.	Rumford	RI
MJ Electric and Refrigeration	Pawtucket	RI
MJB Construction	West Warwick	RI
MJF Plumbing and Heating	Bristol	RI
Modern Mechanical LLC	Woonsocket	RI
MoonWorks	Woonsocket	RI
Morgan Electric	Warwick	RI
Morra Electric Inc.	Johnston	RI
Mpg Mechanical LLC	Charlestown	RI
Mr. Plumber LLC	East Providence	RI
Mr. Rooter Plumbing	Warwick	RI
Multi State Electric Co.	North Providence	RI
Mussulli Electric Co.	Harrisville	RI
Mutual Engineering Service Company	Warwick	RI
Nasons Heating Cooling Sheet Metal	Middletown	RI
National Refrigeration Inc.	Warwick	RI
Naxos Electric	Smithfield	RI
New England Boilder Works	Coventry	RI
New England Energy Concepts Inc.	North Dighton	RI
New England Plumbing Heating and Air LLC	Greenville	RI
Newbury Plumbing and Heating	Tiverton	RI
Newport Electric	Portsmouth	RI
Newport Plumbing and Heating Gas Company	Portsmouth	RI
NGB Electric	Smithfield	RI

Nicholas Electric	Cranston	RI
Nightingale Heating	Providence	RI
Nite Oil	Tiverton	RI
Nolin Electric Incorporated	Providence	RI
Norman Pelletier	North Kingstown	RI
North Atlantic Heating Inc.	Coventry	RI
North Scituate Electric, Inc.	North Scituate	RI
Northeast Efficiency Supply (NES)	Pawtucket	RI
Northeast Electrical Distributors	Cumberland	RI
Northeast Temperature Control Inc.	Westerly	RI
Northern Energy Services Inc.	Providence	RI
Northern Power Electrical Services	North Scituate	RI
Ocean State Air Solutions	Portsmouth	RI
Ocean State Mechanical, Inc.	Fiskeville	RI
Oceanline Combustion Service Inc.	Pawtucket	RI
O'Dowd Electric	Warwick	RI
Old Tyme Electric, Inc.	Pawtucket	RI
Omni Electric	Wakefield	RI
O'Neil Electric Company	Warwick	RI
Owen Blanco	Warwick	RI
P & S Electric Inc.	East Greenwich	RI
Pajan Services Inc.	North Providence	RI
Parente's Oil Service Inc.	Coventry	RI
Parrella Electric	Providence	RI
Patrick Cunningham Electrician	Smithfield	RI
Paul Cinquegrana Electric	North Providence	RI
Paul Manfredo Electric	Warwick	RI
Paul Scotto Electrical	Portsmouth	RI
Payne & Son Electrical Services LLC	Forster	RI
Pellegrino Plumbing and Heating	Westerly	RI
Percivalle Electric Inc.	Warwick	RI
Perez LLC Plumbing Heating and Air Conditioning	Cranston	RI
Performance Restoration Inc.	North Providence	RI
Perrino Electric	Cranston	RI
Peter Chilabato Sure Power Electrical	Portsmouth	RI
Peter J Shadoian	North Providence	RI
Pete's Electric	Johnston	RI
Petro Home Services	Warwick	RI
Petro West Bay Electric Inc.	Warwick	RI
Petronelli Plumbing and Heating	Cranston	RI
Pezzullo & Sons Electric Inc.	East Providence	RI
Philip M Child Inc.	Warren	RI
Philips Precision Plumbing LLC	Greene	RI

Phillip J Bolster Plumbing and Heating	Wakefield	RI
Phillip J Forcier Electric	Cumberland	RI
Phillips Plumbing and Mechanical Inc.	Cranston	RI
Phil's Heating and Air Conditioning	Westerly	RI
Pierce Plumbing and Heating LLC	Westerly	RI
Pinnacle Plumbing and Heating	Greenville	RI
Plumbing Solutions LLC	North Smithfield	RI
Potvin Enterprises Inc.	Warwick	RI
Power By Design Electrical Contracting LLC	Richmond	RI
Precision Climate Control LLC	West Warwick	RI
Preventive Maintenance Solutions	Warwick	RI
Priority Plumbing and Heating Inc.	Providence	RI
Providence Mechanical Services LLC	Smithfield	RI
R & M Electric Inc.	Coventry	RI
R F Heating & Cooling Inc.	Exeter	RI
R.E. Coogan Heating Inc.	Warwick	RI
R.S.C. Plumbing LLC	Exeter	RI
Ralph E Geiselman Plumbing and Heating	Pawtucket	RI
Ram Mechanical Heating & AC	North Kingstown	RI
Rama Electric	Wakefield	RI
Randall Plumbing	Warwick	RI
Ray Gagnon Electric, Inc.	Lincoln	RI
RB Queern Co.	Portsmouth	RI
RC Smith Electric	Warwick	RI
Reardon Plumbing and Heating	Warren	RI
Reddy Piping Concepts Inc.	Cranston	RI
Regan Heating & Air Conditioning Inc.	Providence	RI
Regent Electric CO Inc.	Coventry	RI
Reilly Electrical Contractor Inc.	Providence	RI
Reliable Electric Corp.	Coventry	RI
Reliant Electric	Cranston	RI
Renaissance Sheet Metal LLC	Cranston	RI
Resendes Heating Service LLC	Coventry	RI
Restivos Heating and Air Conditioning	Johnston	RI
Rexel Energy Solutions (Munro Distributing)	Cranston	RI
Rhode Island Sheet Metal LLC	Pawtucket	RI
Rhodes Technologies Inc.	Coventry	RI
RI Insulation	Hope	RI
Ricci Electric	Cranston	RI
Richard Brochu	Manville	RI
Richard Havey	Warren	RI
Rick Tetreault's Electrical Services	Woonsocket	RI
Right View Electric. Inc.	East Providence	RI

Rightway Electric, Inc.	Providence	RI
Rise Engineering	Cranston	RI
Ritacco Electric LLC	Westerly	RI
RMS Ruggieri and Sons Mechanical LLC	Richmond	RI
Robert Davignon	Warwick	RI
Robert Dionne Electrical Contractor	Providence	RI
Robert F Audet Inc.	East Greenwich	RI
Robert Lavigne	North Scituate	RI
Robert M Groleau	Cumberland	RI
Robert Perrino Electric	Cranston	RI
Robert Rachiele Electrician	Coventry	RI
Roberto Rodriguez Service LLC	Providence	RI
Roberts Electric	Pawtucket	RI
Roland Richard	Slatersville	RI
Ronald Vento Electrician	Johnston	RI
Rooter Man Plumbing	Johnston	RI
Ross Landy Electrician	Portsmouth	RI
Rossi Electric Company	Cranston	RI
RR Donnelley & Sons	North Kingstown	RI
RSM Electric	North Providence	RI
RST Mechanical	North Kingstown	RI
Russ Lembo Electrician	Johnston	RI
Ryan Electric Construction	Warwick	RI
Rycor Services	Cranston	RI
S & F Electric Inc.	Warwick	RI
S & K Electric Inc.	Charlestown	RI
S & S Electric	Chepachet	RI
Sadler Services LLC	East Providence	RI
Sakonnet Electric	Bristol	RI
Sakonnet Plumbing and Heating Inc.	Little Compton	RI
Sal Manzi and Son Plumbing and Heating Inc.	Cranston	RI
Sam Bliven Jr Plumbing & Heating Inc.	Westerly	RI
Sanford Electric	Bristol	RI
Santoro Electric	Hope Valley	RI
Santoro Oil Company Inc.	Providence	RI
Santurri Electric	East Greenwich	RI
Sargent Plumbing Inc.	West Kingston	RI
Sasa Energy LLC	Johnston	RI
Sasa Mechanical Contractors Inc.	Johnston	RI
Savard Oil Company Inc.	East Providence	RI
Schroff Technologies Inc.	North Kingston	RI
Scott Gatta Electric	Johnston	RI
Sensible Heating and Air Conditioning LLC	Hope Valley	RI

Sepol Industries Inc.	Portsmouth	RI
Shamrock Electric	Middletown	RI
Shearman Oil Inc.	Tiverton	RI
Shepherd Services	Cumberland	RI
Sheridan Electric Inc.	Warwick	RI
Shoreline Plumbing	Charlestown	RI
Skanska USA Building Inc.	Warwick	RI
Smalls Plumbing Inc.	Woonsocket	RI
Smp Electric LLC	West Warwick	RI
SMS Oil Burner Service Inc.	Jamestown	RI
Sonner Plumbing Heating and Construction Inc.	Cranston	RI
Sosa & Son Heating Air Conditioning & Refrigeration	Woonsocket	RI
South County Community Action	North Kingstown	RI
South County Gas Service	Narragansett	RI
Spencer's Plumbing	North Kingstown	RI
SPL Electrical Corporation	North Smithfield	RI
Stafford Electric	North Scituate	RI
Standish Heating and Air Conditioning	Coventry	RI
Statewide Insulation	North Smithfield	RI
Stedman & Kazounis Plumbing and Heating	Charlestown	RI
Stem Electrical	Warwick	RI
Stephen Andrea Fire & Electric, LLC	Coventry	RI
Stephen Freitas Plumbing and Heating	Lincoln	RI
Steven Cacicia Electrician	Providence	RI
Steven Maymon	Warwick	RI
Sullivan & McLaughlin	Greenville	RI
Summit Electrical Contractors Inc.	Lincoln	RI
Sunshine Fuels and Energy Services, Inc.	Bristol	RI
Superior Comfort Inc.	Bristol	RI
Superior Electric	Providence	RI
Superior Fire & Electrical Services	North Providence	RI
Superior Insulation	Narragansett	RI
Superior LED Light Solutions	Warwick	RI
Superior Plumbing and Heating	Cranston	RI
Superior Security Systems LLC	Cranston	RI
Supply New England	Pawtucket	RI
SW & Sons Plumbing & Heating	Johnston	RI
Swajian and Son	Cranston	RI
Sylvester Sheet Metal Inc.	West Warwick	RI
Symmes Maini & McKee Asso	Providence	RI
T & T Plumbing and Heating Inc.	Hope Valley	RI
T Gomes Heating and Cooling	Warwick	RI

T.A. Gardiner Plumbing & Heating Inc.	Bristol	RI
Tasso Plumbing and Heating	Middletown	RI
Tebano Electric	Bristol	RI
Tebo Electric Inc.	Woonsocket	RI
The Plumber Company LP	Cranston	RI
Thermal Energy Inc.	Cranston	RI
Therrien Mechanical Systems	Lincoln	RI
Thielsch Engineering Inc.	Cranston	RI
Thomas Calci Plumbing	Coventry	RI
Thomas J Danusis Electrical Contractor Inc.	Hopkinton	RI
Thomas P McGee Plumbing and Heating	North Smithfield	RI
Tom Whitaker	Newport	RI
Toms Plumbing LLC	Manville	RI
Toner Electric Company	Middletown	RI
Tops Lighting (Electric Supply Company)	Providence	RI
Total Comfort Heating and Cooling Inc.	Lincoln	RI
Total Control HVAC LLC	Cranston	RI
TPF Electrical Services	Pawtucket	RI
Travers Plumbing and Heating Inc.	Portsmouth	RI
TRC Companies, Inc.	Providence	RI
Tri-Town Community Action	North Providence	RI
TruNorth Construction	Warren	RI
Tuma Insulations	Warwick	RI
UG Nasons Inc.	Middletown	RI
United Mechanical Inc.	Cranston	RI
V Letizia Plumbing, Heating, Fire Protection	Providence	RI
Valcourt Heating Inc.	Tiverton	RI
Valley Heating and Cooling Inc.	Wyoming	RI
Van's Electric Inc.	Bristol	RI
Vaughn Oil Company Inc.	Smithfield	RI
Venco Electric LLC	Cranston	RI
Vicmir & Sons Heating and Air Conditioning Controls	Riverside	RI
Victor Aillienello	Providence	RI
Viking Electric Inc.	Providence	RI
Vintage Plumbing	Providence	RI
Vivona Plumbing and Heating Inc.	Portsmouth	RI
W.W. Grainger, Inc.	Warwick	RI
Wakefield Heating Service	Wakefield	RI
Waldo Plumbing and Heating LLC	Lincoln	RI
Warner's Appliance Services	Cumberland	RI
Warren Stephenson	Coventry	RI
Watermark Plumbing LLC	Cranston	RI

Westbay Community Action	Warwick	RI
Wickford Appliance and Lighting Inc.	Pawtucket	RI
Wilkinson Plumbing and Heating	West Kingston	RI
William Calia Electrician	Johnston	RI
William Francis	Bristol	RI
William J Riley Plumbing and Heating	Warwick	RI
William Merritt Plumbing and Heating LLC	North Kingstown	RI
William N Harris Inc.	Providence	RI
William R Vallee Jr. Plumbing and Heating	Block Island	RI
William Soares Electric	Bristol	RI
Wojcik Electric	Narragansett	RI
Woods Heating Service	East Providence	RI
Wordell Heating & Cooling LLC	Little Compton	RI
Wyman and Sons Inc.	Providence	RI
Yuszczaks Plumbing and Heating Inc.	North Smithfield	RI
Zawadzki Plumbing and Heating Inc.	Warwick	RI
Zompa Plumbing and Heating	Warren	RI
Calson Corporation	Johnston	RI
Benchmark Group Inc.	Rogers	AR
Association of Energy Services Professionals	Phoenix	AZ
AUTOGRID SYSTEMS INC	Redwood City	CA
Nest	Palo Alto	CA
PLMA	Vallejo	CA
Regency Lighting	Chatsworth	CA
Whisker Labs Inc.	Oakland	CA
E Source Companies LLC	Boulder	CO
Skumatz Economic Research Associates	Superior	CO
Dynamic Building & Energy (Formerly Uplands Construction Group)	N. Stonington	CT
John G Smith	Brooklyn	CT
Kingspan Energy	Stamford	CT
L&M Electric LLC	North Branford	CT
Praxis Research Partners	Westport	CT
Shannon Energy Resources	Thomaston	CT
Techniart Inc.	Collinsville	CT
TRC - EEC&C	Windsor	CT
Tuscany Design Build	South Windsor	CT
Voltz Electric	Wallingford	CT
Wattsaver Lighting Products Inc.	East Hartford	CT
Energy Solutions Center	Washington	DC
Smartpower	Washington	DC
Express Lighting, Corp.	Melbourne	FL

Pro. Unlimited Inc.	Boca Raton	FL
National Energy Educational Development Need	Manassas	GA
Innerworkings Inc.	Chicago	IL
3-D Lighting	Franklin	MA
A & M Electrical Mechanical, Inc.	Fall River	MA
ABE Electrical Installations	Northborough	MA
Action Inc.	Fall River	MA
Advanced Energy Services	Hopedale	MA
Ahaesy Electric	Fall River	MA
Air Energy LLC	South Easton	MA
Alternative Weatherization, Inc.	Fall River	MA
Andelman and Lelek Engineering Inc.	Norwood	MA
B2Q Associates Inc.	Andover	MA
Backlund Electric	Norfolk	MA
Baystate Energy Reduction	Sutton	MA
Beaupre Electric	Assonet	MA
Boiani Electric LLC	Portsmouth	MA
Brite Lite Electrical Company	Weymouth	MA
Broadway Electrical Co.	Dorchester	MA
Bruin Corp	North Attleboro	MA
Bulbs.com	Worcester	MA
Carlos A Magina Electrical Inc.	Seekonk	MA
Certified Connections Inc.	Worcester	MA
CL Fisk and Sons Inc.	Seekonk	MA
Coastal Light Electric Inc.	West Yarmouth	MA
Commonwealth Electrical Technologies	Worcester	MA
Complete Recycling Solutions LLC	Fall River	MA
Concord Electric Supply	Fall River	MA
Consolidated Marketing Services	Burlington	MA
Consortium For Energy Efficiency	Boston	MA
Corbiel Associates Inc.	South Weymouth	MA
Craig R Casavant Inc.	Blackstone	MA
Crown Supply Company Inc	Milford	MA
Daniel Cabral	Fall River	MA
DMI	Wellesley	MA
DP Electric Inc.	Blackstone	MA
Drolet Electric	North Attleboro	MA
DuCom Electric Inc.	Tewksbury	MA
Ecast Video LLC	Boston	MA
Ecova Inc.	Boston	MA
Efficiency Forward Inc. (DLC)	Medford	MA
Efficient Buildings LLC	Bridgewater	MA
Electric Supply Center	Mansfield	MA

ENE Systems Inc.	Canton	MA
Energiwise Inc.	Medford	MA
Energy & Resource Solutions Inc.	North Andover	MA
Energy Federation Inc.	Westborough	MA
Energy Monster	Worcester	MA
Engie Services U.S.	Norwell	MA
Florence Electric LLC	Canton	MA
Focal Point Data Risk LLC	Newton	MA
GenCon Service Inc.	West Bridgewater	MA
GH Electrical Service	Attleboro	MA
Graybar	Boston	MA
Greenleaf Associates Inc.	Weston	MA
Hancock Software Inc.	Framingham	MA
Hull Electric	Marblehead	MA
IBM Corp.	Cambridge	MA
ICF Resources LLC	Cambridge	MA
Insulate 2 Save	Fall River	MA
Insulation R Us Inc.	Fall River	MA
Interstate Electrical Services Co.	North Billerica	MA
ION Lighting Distribution Inc.	Chicopee	MA
James Cordeiro Jr. Electrical Services	Fall River	MA
John Landry Electrician	Somerset	MA
Jones Lang LaSalle Construction	Boston	MA
KEMA	Burlington	MA
Kevin R Curt Electrical LLC	Fall River	MA
KM Kelly Inc.	Rochdale	MA
Lefevre	Taunton	MA
Leiser Corporation	Weston	MA
Litemor	Norwood	MA
LLEJ Equipment Inc.	North Easton	MA
Lockheed Martin	Burlington	MA
Matthew DeCicco Electric	Reading	MA
Mike Bell Electrician	Seekonk	MA
MV3 LLC	Canton	MA
National LED Distributors	Milton	MA
National Lightbulb	North Easton	MA
National Resource Management	Canton	MA
Navigant Consulting, Inc.	Boston	MA
NESCO (Needham Electric Supply)	Canton	MA
New Ecology Inc.	Boston	MA
NMR Group Inc.	Somerville	MA
Northeast Energy Efficiency Partnerships (NEEP)	Lexington	MA
Northeast LED, LLC	Pepperell	MA

Northeast Sustainable Energy	Greenfield	MA
O'Brien & Neville Inc.	Holliston	MA
O'Brien Electric	Plymouth	MA
Opinion Dynamics Corporation	Waltham	MA
Opterra Energy Services	Norwell	MA
Oracle America	Cambridge	MA
Peregrine Energy Group	Boston	MA
Piper Electric Inc.	Leominster	MA
Pmm Electric Inc.	Sandwich	MA
Ralco Electric Inc.	Westport	MA
Raymond D. Melanson Electric	Swansea	MA
Raytheon Company	Waltham	MA
Rethinking Power Management	Boston	MA
Retrofit Insulation	Fall River	MA
RF Plumbing and Heating	Mansfield	MA
ROI Energy Investments LLC	East Walpole	MA
Rooney Electric	North Reading	MA
Sacks Exhibits	Wilmington	MA
Sanlo Electric	Fall River	MA
Savio Lighting	Needham	MA
Sikora Electric	Fall River	MA
SourceOne Inc.	Boston	MA
South Coast Alternative Power Solutions	Acushnet	MA
South Shore Electrical LLC	Hingham	MA
Souza & Branco Electric	New Bedford	MA
Sprague Energy	Westborough	MA
Standard Electric	Wilmington	MA
State Electric Corporation	Bedford	MA
Stateline Fuel & Burner Service Inc.	Seekonk	MA
Steam Trap Systems	Amesbury	MA
Superior Energy Solutions	Swansea	MA
Synapse Energy Economics Inc.	Cambridge	MA
Tetra Tech	Marlborough	MA
The RETEC Group Inc.	East Walpole	MA
TNZ Energy Consulting Inc.	Stoughton	MA
Universal	Providence	MA
Veolia ES Technical Solutions LLC	Boston	MA
Vinnie Farrell Plumbing & Heating	Fitchburg	MA
Waran Electrical Technologies	Boston	MA
Wayne D Faria	North Dartmouth	MA
Wiedenbach-Brown	Norwood	MA
Wipro	Quincy	MA
World Energy Efficiency Services LLC	Worcester	MA

ANTARES Group Inc.	Lanham	MD
APTEC LLC	Bethesda	MD
Earth Networks Inc.	Germantown	MD
Boyko Engineering Inc.	Gorham	ME
Don Gagon	Biddeford	ME
Energy Design Service Systems LLC	Whitmore Lake	MI
Appliance Recycling Centers of America, Inc. (ARCA)	Hopkins	MN
Wildman's Electric Inc.	Glenwood	MN
APEX Analytics	Greensboro	NC
Costal Lighting LLC	Wilmington	NC
IMMI (International Marketing Management, Inc.)	Portsmouth	NH
Clear Energy LLC	Bloomfield	NJ
CMC Energy Services Inc.	Cranbury	NJ
Ideas Agency Inc.	Blairstown	NJ
CDH Energy Corp.	Cazenovia	NY
CHA Consulting Inc.	Albany	NY
FDM Group Inc.	New York	NY
Integrated Marketing Services Inc.	Liverpool	NY
L&S Energy Services Inc.	Clifton Park	NY
Logistic Innovations	Valhalla	NY
Ram Marketing	Saint James	NY
Rensselar Research	Troy	NY
Loeb Electric	Columbus	OH
Melink Corp.	Milford	OH
Quality LED Lighting	Aurora	OH
Questline Inc.	Columbus	OH
ecobee Inc.	Toronto	ON
Aelux-Wesco	Blue Bell	PA
Pontoon Solutions Inc.	Pittsburgh	PA
Blackhawk Engagement Solutions	Lewisville	TX
NexRev Inc.	Plano	TX
Compressed Air Challenge	Alexandria	VA
Kelliher Samets Volk	Burlington	VT
Vermont Energy Investment Corporation	Burlington	VT
D & S Electrical Contractors Inc.	Clarkston	WA
New Buildings Institute Inc.	White Salmon	WA
Northwest Energy Efficiency Council	Seattle	WA
ILLUME Advising LLC	Madison	WI
Market Probe Inc.	Milwaukee	WI

Attachment 6
2017 RGGI Auction Proceeds

Attachment 6

2017 RGGI Auction Proceeds Report

Rhode Island
Regional Greenhouse Gas Initiative, Inc. Auction Proceeds
2017 Year End Report
Presented by National Grid
May 1, 2017

Introduction

From the beginning of the Regional Greenhouse Gas Initiative (RGGI) through June 1, 2016, Rhode Island (RI) has received approximately $52 million from CO2 Allowance Auctions.[1] As of July 7, 2017, National Grid received $26.3 million of those funds in order to expand energy efficiency (EE) efforts throughout the state (See Table 1).

This report provides results for RGGI funds spent during National Grid EE Program Year 2017. The results from prior allocations of RGGI funds have been described in prior Year End Reports.

Lowering the System Benefit Charge

Under the OER's 2016-B Plan for the Allocation and Distribution of Regional Greenhouse Gas Initiative Auction Proceeds, the Company received $2,009,452 to lower the ratepayer System Benefit Charge. Per this requirement, these funds were allocated across Residential, Income-Eligible, Commercial and Industrial electric efficiency programs managed and delivered by National grid. The Company incorporated this funding into its Energy Efficiency Program Plan for 2017 (Docket No. 4654), which is shown in Table E-1 as a reduction in total customer funding required.

The $2,009,452 in RGGI funds used to lower the 2017 System Benefit Charge provides tremendous benefits to Rhode Island. Without this funding the overall electric program budget would have been reduced by 2%. The lower funding would have resulted in a loss of 4,027 MWh savings; 41,315 MWh lifetime savings; and $4.9 million in benefits to ratepayers.

Agriculture

The 2013 RGGI Plan allocated $200,000 and the 2015 Plan allocated another $100,000 to provide energy efficiency rebates to commercial businesses, including the agricultural sector, that use deliverable fuels (oil and propane) for heat. During the second quarter of 2015, $5,700 was transferred from this initiative to the Community Buildings initiative to support high customer demand.

A total of 15 audits and pre-audits were conducted. In most cases the energy savings opportunities were lighting and in a few cases related to refrigeration. After the audit the customers were provided with audit reports and total project and incentive costs available to them.

[1] Source: http://www.rggi.org/market/co2_auctions/results

Residential Delivered Fuels

During program year 2015, National Grid received $1,500,000 for Residential Delivered Fuels. In May of 2016, the Company received $1,000,000.96 from the 2016 RGGI Allocation Plan to complete additional projects.

At the end of the first quarter, the Company spent the remaining $21,484.26 allocated to oil weatherization jobs.

In total, these funds have enabled the completion of 2,511 oil weatherization jobs, resulting in 41,198 MMBtu of oil savings and 570,318 kWh of electricity savings.

Rhode Island Public Energy Partnership

RIPEP builds on a Department of Energy Grant and is intended to help state agencies and local governments attain high levels of energy savings and improved building operations. The primary objectives of RIPEP are to:

- Create a comprehensive inventory of energy consumption in public facilities, both state and municipally owned or managed;
- Implement energy efficiency measures in approximately 100 facilities and attain an average of 20% energy reduction; and
- Identify and mitigate barriers to efficiency improvements in the public sector. Initial priority will be given to water supply facilities, schools, and state buildings, followed by other municipal facilities.

The 2012 Allocation Plan added $1,515,851 for RIPEP, to be administered by National Grid. Of this amount $500,000 was set aside for incentives and $1,015,851 was placed into a revolving loan fund for on-bill repayment. In 2015, the Company received an additional $1,000,000 for RIPEP. Of this amount, $100,000 was added to incentives; $800,000 was injected into the electric loan fund; and $100,000 was used to set up a gas revolving loan fund. In May 2015, $82,660 was transferred from RIPEP incentives back to the RI Office of Energy Resources for the Block Island project.

In total, $433,461 was spent on RIPEP incentives, creating 1,280,517 kWh of savings.

As of the end of 2017, the on-bill repayment portion of RIPEP lent $18,003 to one municipal customer, creating 15,000 kWh of savings. In January 2017, $253,322.56 was transferred from the RI PEP Electric Loan Fund to the RI PEP Electric Incentives Fund.

Table 1: Spending & Reporting

Auctions	Received	EE Funding	Initiative	Budget	2011 Spend	2012 Spend	2013 Spend	2014 Spend	2015 Spend	2016 Spend	2017 Spend
1-5	March 2010	$ 3,950,152	Program Spending	$ 3,950,152	$ 3,950,152						
	December 2010	$ 2,633,434	Heat Loan	$ 449,463	$ 146,698	$ 302,765					
			Homes Tier III Pilot	$ 65,000	$ -	$ -					
			Deep Energy Retrofit Pilot	$ 260,000	$ 27,848	$ 297,152*					
			Small Bus. Revolving Loan Fund	$ 1,858,971	$ 1,843,371	$ 15,600					
6-10	January 2012	$ 4,034,678	Small Bus. Revolving Loan Fund	$ 2,300,000	n/a	$ 2,300,000					
			Large Bus. Revolving Loan Fund	$ 1,734,678	n/a	$ 1,734,678					
11-14	August 2013	$ 1,813,732	RI Public Energy Partnership	$ 1,515,851							
			Loan Fund	$1,015,851				$ 1,015,851			
			Incentives**	$ 417,340				$ -	$ -	$ 417,340	
			Small Bus Community Bldgs	$ 372,288			$ 303,851		$ 68,437		
15-18	February 2014	$ 1,427,713	Residential Delivered Fuels	$ 800,000				$ 800,000			
			Agricultural Delivered Fuels	$ 194,300				$ 1,600	$ 38,854	$ 15,331	
			Small Bus Community Bldgs	$ ***433,413				$ 363,931	$ 69,482		
19-22	January 2015	$ 3,635,495	Lower 2015 System Benefit Charge	$ 3,635,495					$ 3,635,495		
23-28	October 2015	$ 6,118,674	Lower 2016 System Benefit Charge	$ 3,588,674						$ 3,588,674	
			RI Public Energy Partnership	$ 1,000,000							
			Electric Loan Fund	$ ****546,677						$ 46,677	
			Gas Loan Fund	$100,000						$ 100,000	
			Incentives****	$353,322						$ 16,121	
			Residential Delivered Fuels	$ 1,500,000					$ 1,199,867	$ 300,133	
			Agricultural Delivered Fuels	$ 100,000							
29-30	May 2016	$ 1,000,001	Residential Delivered Fuels	$ 1,000,001						$ 978,517	$ 21,484
31-32	October 2016	$ 2,009,452	Lower 2017 System Benefit Charge	$ 2,009,452							$ 2,009,452
Total				**$ 26,267,738**	**$ 5,968,069**	**$ 4,650,195**	**$ 303,851**	**$ 2,181,382**	**$ 5,012,135**	**$ 5,045,452**	**$ 2,030,937**

*Deep Energy Retrofit Pilot includes funds from Homes Tier III Pilot as detailed in the 2012 RGGI Report to OER

**In May 2015, $82,660 was transferred from RI PEP incentives back to the RI Office of Energy Resources for the Block Island project.

***In June 2015, $5,700 was transferred from Agricultural Delivered Fuels to Small Business Community Buildings to meet high customer demand.

**** In January 2017, $253,322.56 was transferred from the RI PEP Electric Loan Fund to the RI PEP Electric Incentives Fund

Table 2: Rhode Island Public Energy Partnership (RI PEP) Electric and Gas Loan Funds

Rhode Island Public Energy Partnership (RI PEP) Electric Loan Fund
Year End 2017

(1)	2017 Funds Available	$736,507
(2)	Committed	$0
(3)	Paid	$18,003
(4)	Moved to RI PEP Incentives	$253,323
(5)	Repayments	$339,972
(6)	Participants	1
(7)	Savings (MWh)	15
(8)	Available	$805,153

Rhode Island Public Energy Partnership (RI PEP) Gas Loan Fund
Year End 2017

(1)	2017 Funds Available	$92,565
(2)	Committed	$0
(3)	Paid	$0
(5)	Repayments	$1,652
(6)	Participants	0
(7)	Savings (Therms)	0
(8)	Available	$94,217

1 Funds available as of January 1, 2017.

2 As of December 31, 2017

3 As of December 31, 2017

4 In January 2017, $253,322.56 was transferred from the RI PEP Electric Loan Fund to the RI PEP Electric Incentives Fund

5 As of December 31, 2017

6 As of December 31, 2017

7 As of December 31, 2017

8 Available funds as of December 31, 2017