

2019 Commercial and Industrial (C&I) Energy Efficiency Solutions and Programs

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1. Introduction

The 2018-2020 Three-Year Plan details four central principles that encompass an advanced and innovative approach to serving commercial and industrial customers and the building industry at large. These four principles are apparent in all aspects of the 2019 Plan and incorporated in the planning process, which included many brainstorming sessions from internal teams to external stakeholders. In addition, each of the Company's strategies, programs and initiatives are focused on meeting the needs of customers, the environment, and preparing for the future. Below are the four key priorities the Company has identified in the 2018–2020 Three-Year Plan.

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Customers - Deliver comprehensive services encompassing all market segments and customers. Such services will enable customers to control their energy use, [manage their peak energy use](#), reduce their bills, and help support their financial well-being.

Least Cost - Deliver energy efficiency services as cost-effectively as possible through optimizing finance and promoting upstream initiatives. Continuing to deliver cost effective energy savings under Least Cost Procurement will create cost savings to all customers, while creating economic benefits that create and maintain local jobs and businesses.

Environment - Provide solutions that minimize greenhouse gas emissions and contribute to Rhode Island's clean energy policy goals, including the Resilient Rhode Island Act.

Future – Innovate to capture savings from new technologies and strategies to position energy efficiency programs for the future including the integration of energy efficiency with demand response, renewable energy, and smart grid technologies. This includes incorporating outcomes from the Rhode Island Power Sector Transformation Initiative and Docket 4600.

Affordability and financing for the Company's customers are important criteria to achieve all the energy efficiency strategies and innovations that the Company is proposing in this plan. The Company has worked closely with both The Rhode Island Infrastructure Bank (RIIB) and outside sources of capital over the past couple of years to assemble a set of offerings that allow nearly every type of building and project to be

financed. National Grid, along with its partners, will continue to educate the market on these mechanisms and provide guidance to customers on which choices may be best for their particular project.

a. Structure of C&I Energy Efficiency Programs and Initiatives – Attachment 2

Four Main C&I Themes

1. **Better Customer Experience:** The Company believes that customer experience is prioritizing the customer’s wants and needs and keeping central to the Company’s business strategy for energy efficiency programs and peak demand reduction programs. Understanding the customer journey is about learning what customers experience from the moment they begin considering energy efficiency, and then working to make the journey toward energy efficiency solutions as simple, clear, and efficient as possible.
2. **Market Sector Approach:** The reasoning for this approach is simple: success lies in demonstrating a deep understanding of the customer’s requirements, of their needs that are directly shaped by the industry and geographies in which the customers operate, and on the industry or sectors strategic and commercial pressures. A sector approach allows us to customize solutions that fit the customers’ needs and increase participation in energy efficiency.
3. **Affordability and Financing:** An important goal of The Company’s programs is to help minimize these upfront project costs so building owners are encouraged to invest in more comprehensive energy efficiency improvements and significant retrofits.
4. **Education, Awareness and Trainings:** Education, information and awareness are the first steps to making informed decisions. The Company will focus on all opportunities that help customers in RI become aware, educated and informed about energy efficiency so that they can participate in energy efficiency and help the state achieve its environmental goal.

Four Types of Programs

1. Large C&I New Construction – Focuses on offerings that target ground up new construction, major renovations, tenant fit-outs and end of life replacement equipment.

Deleted: In addition to the Company’s On Bill Repayment (OBR) initiative, the timing in Rhode Island is right for enhancing affordability through the Rhode Island Infrastructure Bank that is further enhancing energy efficiency investments for its customers. In the 2017 plan, in addition to the successful collaboration between the Company’s financing and the Efficient Buildings Fund (EBF), the Company highlighted the recently launched C-PACE program through RIIB that allows for additional financing for commercial building customers. This program will continue in 2018.

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2. Large C&I Retrofit – Focuses on all services and technologies towards retrofits needed for existing buildings.
3. Small Business/ Direct Install (SMB/DI) – Focuses on providing turn-key solutions to many types of small businesses.
4. Demand Response programs - Focus on reducing peak electric demand and associated costs for large commercial customers. For small commercial customers peak demand reduction will be through direct load control technologies.

It should be noted that the offerings for Large C&I New Construction and Retrofit Programs are also available to small business customers.

The Appendices provide further details to the three programs mentioned above. The following figures and tables are available in the appendix:

1. Sample list of custom measures for new construction and retrofit programs
2. Program logic model for retrofit program
3. Program logic model for new construction program
4. Goals and incentive description of each of the electric sub-programs
5. Goals and incentive description of gas program measures

2. Central Themes for Efficiency

a. Better Customer Experience & Analytics

The following section describes the four broad areas mentioned previously and how they will connect with all the Commercial and Industrial (C&I) Efficiency Programs and strategies: Large Commercial New Construction, Large Commercial Retrofit and Small Business Direct Install.

i. Improving Quality and Efficiency in Project Cycle Times

The Company is committed to providing customers with a more expedited project initiation and incentive application (transactional) experience. The Company continues to look for process improvement relative to processing applications, and the building Technical Assistance (TA) review process. Early in 2018 the Company began designing and implementing a new web-based portal for customers to create and submit fully digital incentive applications replacing the PDF based forms that have been used for

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years. This new portal, [Rhode Island Digital Application Portal, \(RIDAP\)](#) will greatly improve the customer experience, accelerate application review and incentive payments, and potentially increase participation. [RIDAP will be fully in place by the beginning of 2019.](#)

ii. Data Analytics

National Grid, like many other utilities and other companies around the globe, is focused on how data can improve its decisions, inform its strategic planning, and understand its customers more completely. The Company plans to use customer intelligence software platform that will help with customer insights and enhance customer satisfaction. The software platform enable sales, marketing, and account management teams to connect the right customer to the right offer at the right time, driving customer conversion. This platform will also allow the Company to drive higher awareness and participation in programs and allow for more impactful interactions with customers that deepen the value of energy projects. The Company will continue to examine new pathways to obtain more detailed information on its large customers that will drive a more targeted approach to customers and hence higher participation.

iii. Tools for Customers' Management of Energy Usage

The Company intends to help customers access their energy data to allow for greater awareness of energy consumption. The Company will seek to achieve this through the various methods described below:

iv. Automated Benchmarking Systems

National Grid has developed a path towards automating data uploads into Energy Star's Portfolio Manager. The Company acknowledges automated usage data transfer to customers as an important tool in the future for building labeling intentions, supporting prior OER commitments to support state/municipal facilities improvements, and as a tool for helping customers to better understand their energy usage. In 2019 customers can automatically upload aggregate, whole building energy usage data, both electric and gas, onto the Portfolio Manager and will allow building owners and stakeholders to benchmark energy usage and performance and compare usage to similar buildings nationally. This process will also support the City of Providence's building energy reporting and disclosure ordinance that the City is planning to implement in 2019. The ordinance will require building owners of large and medium sized buildings to report

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their annual energy use. The goal of this ordinance is to make building owners and operators more aware of their energy usage and help them improve energy efficiency of their buildings. The Company is currently supporting the City’s stakeholder process for the co-creation of this ordinance.

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The Company will support benchmarking with customer support on automating data uploads as well as provide access to EPA training on Portfolio Manager.

v. Green Button

The Green Button initiative is an industry-led effort that responds to a White House call-to-action to provide utility customers with easy and secure access to their energy usage information in a consumer-friendly and computer-friendly format. Customers are able to securely download their own detailed energy usage with a simple click of a literal “Green Button” on electric utilities’ websites.¹ In 2016-2017, more than 500 C&I and residential customers downloaded their energy use data with Green Button. This included both gas and electric customers. In 2019, National Grid plans to examine Green Button Connect My Data. Green Button Connect My Data is a new capability which allows utility customers to automate the secure transfer their own energy usage data to authorized third parties, based on affirmative (opt-in) customer consent and control.

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Green Button¶

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vi. Building Labeling

The Company will continue to work with the Office of Energy Resources (OER) and other stakeholders to identify strategies for building labeling in the commercial and multifamily real estate sectors in Rhode Island. Building labeling will provide greater transparency in the energy performance of a given building. This initiative, currently led by OER, is working to establish building labeling parameters and mechanisms for commercial and multifamily properties. This will likely require the linking of the Company’s energy usage database with operational and asset based rating systems that property owners will use to benchmark their buildings. The Company will continue to work closely with OER to support property owner and tenant access to usage data. Benchmarking and Labeling efforts will also help towards achieving Zero Energy Building (ZEB) goals for existing buildings as detailed in the Company’s ZEB white paper (see more details in the ZEB section below).

¹ <https://energy.gov/data/green-button>

b. Market Sector Approach

Specific enhancements to some sectors are highlighted below:

- Grocery/Supermarkets
- Industrial/Manufacturing
- Municipal & State
- Hospitality (Restaurants & Lodging)
- Specialty buildings including: Farm/Agriculture and Extended Care Facilities
- Hospitals
- Colleges and Universities
- Commercial Real Estate
- Multifamily

i. Approach to Large and Mid-Sized Customers Based on Usage

The Company's sales and operations teams will continue to address the unique needs of customers depending on their annual usage, peak demands and market segmentation. Customers with annual average demand of 200kW or greater and 75,000 therms or greater are classified as large and are managed by individual sales representatives. These customers are supported by Strategic Sales staff who are backed by technical experts for that particular customer type. The sales team works with customers either directly or through project expeditors and vendors and offer pathways to upgrade various systems within a facility including, not limited to, lighting, HVAC, and compressed air. They can also call on the Company's Technical Assistance (TA) Vendors to help the customer with a more comprehensive look at their entire facility where appropriate. In many cases, this more comprehensive look helps customers uncover opportunities for savings previously unknown to them or beyond common measures.

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Deleted: Since 2015, customers with annual average monthly peak demand between 200 to 500 kW and less than 75,000 therms are being served through the Channel Sales group.¶

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Deleted: In some cases the sales teams customize solutions to meet the needs of the customers. Sales may work with large customers to hold and/or manage incentives in escrow accounts for future EE. In addition, National Grid also has an upstream program from C&I customers that is targeted at moving low cost inefficient products out of marketplace and high efficiency into market. This program is open to all C&I customers

The sections below provide details on each of the current market sectors

a. Grocery Sector

The Company will continue to provide targeted energy savings opportunities to Rhode Island's grocery customers through the EnergySmart Grocer (ESG) Initiative. ESG has been in operation since 2013 and the third party contractor has been working with grocers to identify a wide array of retrofit and new construction opportunities. The program has had a tremendous amount of success engaging this segment and has met or exceeded its goals in both 2016 and 2017. National Grid expects that this effort will

also meet its goals in 2018. This means that the ESG initiative will have delivered more 12,000 net MWh and more than 100,000 therms since its inception.

The customers served by this initiative include a combination of local, regional, national and even international grocers and other retail establishments who sell food and have heavy refrigeration usage. ESG provides “unitized” incentives – i.e., \$ per unit physical unit such as linear feet, square feet, horsepower, etc. – for the most common measures relevant to these customers which provides an easy to understand offering which leads to easier project planning and investment decisions. ESG also offers custom project engineering support to help customers pursue all cost effective measures in their facilities.

Deleted: The ESG initiative delivered over 6.9 million kWh and 49,000 therms of savings in 2015 as part of its strongest year to date and reflects several large projects which pushed delivery well above goals for that year. ESG is showing solid delivery through June 2017 towards the 3.36 million kWh 2017 goal. Therm savings are projected at 13,000 therms for 2017. In 2018, this initiative is expected to save a total of 3.36 million kWh and over 13,000 therms. ¶

The measure mix to date includes:

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1. Infiltration measures (night covers, strip curtains)
2. Lighting (LED case lighting, LED shelf or end-cap lighting, LED fixtures or solutions for walk-in refrigeration, LED parking lot lighting)
3. Refrigeration (adding doors to open refrigerated cases, highly efficient motors in refrigerated walk-ins and cases)
4. Refrigeration controls (floating head pressure control and floating suction pressure control)
5. HVAC measures (controls and VFD’s)

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From 2016 to present, ESG has delivered over 63% of its electric savings from refrigeration measures, 15% from HVAC measures, and 21% from lighting measures. The remaining 1% came from other areas.

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The ESG initiative has introduced or is in the process of introducing a number of technologies and new options for customers. Some were noted in the 2018 plan such as hybrid condensers, hot water heat reclaim, and permanent magnet synchronous motors. Others were not and will be added in late 2018 or early 2019 such as coffin cases with lids, destratification fans, and variable speed drives on kitchen ventilation.

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Through implementing ESG over the last few years, the Company learned that marketplace understanding has grown tremendously through targeted outreach and is reflected in the strong delivery of the initiative. The Company also learned that greater integration across other offerings like the Small Business program could lead to better customer service and more successful projects. As a result, the Company has begun to incorporate ESG services for all small grocery customers as well. In fact, savings from independent markets increased approximately 50% from 2017 to 2018.

b. Municipal and State Buildings

The three year (2012-2015) DOE funded Public Energy Partnership (RIPEP) led to approximately 123 municipal and state buildings reaching an average of 28.6% projected energy reduction, far beyond the DOE goal of 20% for the partnerships. In combination with the Efficient Buildings Fund (EBF) through RIIB and the Company's existing collaboration with municipal customers, the Company forecasts continued momentum in energy efficiency in the municipal sector. In addition, incentives and technical support will continue to be offered in 2019, in specific areas including:

c. Project/Energy Management Support

In 2016, the Rhode Island Infrastructure Bank's (RIIB) Efficient Buildings Fund (EBF) was created to provide capital for comprehensive projects in the municipal and quasi public agency space. The time and expertise required to identify, develop, and oversee these projects can be beyond the resource capacity of many towns and cities. In 2016 the Company supported several municipalities that applied for EBF applications. Support included reviewing project submittals, supporting city/town Council approvals, implementation planning, reviewing efficiency project proposals, RFP development, and bidder selection.

The support for energy efficiency project implementation and street lighting that the Company and its vendor provided in 2016 and 2017 produced significant results. Municipalities have recognized the value of this type of support as it provided a trusted partner to bring the time and expertise municipalities lack to identify, develop and oversee complex projects. In order to continue to serve this sector, there are several support mechanisms in place for 2019:

Deleted: ESG is considering adding a hot water heat reclaim measure to the offering and is in the process of reviewing the calculation methodology. Additional new technologies being brought forward include: permanent magnet synchronous motors, an even more efficient motor than existing technologies used in fractional horsepower applications, as well as hybrid condensers that utilize evaporative pre-cooling during warmer months for more efficient refrigeration system operation

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- URI will be supporting municipalities as they learn to use Portfolio Manager as well as meet the EBF's energy reporting and energy management plan development requirements.
- The Company will continue to support municipal engagement in OER and RIIB programs like vendor selection, engineering support, and implementation of upgrades through the EE programs.
- The Company will also provide energy audits to select municipal/school/wastewater customers to support their EBF applications. In the past few years the Company has provided in the range of approximately 50 energy audits annually.
- For financing in this sector, the Company will continue to offer On-Bill Repayment for electric and gas measures. The Company and other partners such as OER will assist RIIB with municipal projects currently enrolled in the EBF program through RIIB, and on municipal projects that subscribe in 2018. The Company plans to serve on the committees in order to ensure that customers have access to finance, that the process is easy, and that the Company and RIIB are working with customers in a coordinated way.

Deleted: RIIB has hired project management support to provide auditing and project installation services to municipal customers.

d. State SEMP

In June 2016, a joint Memorandum of Understanding (MOU) was signed between the Company, OER, Department of Administration (DOA) and Department of Capital Asset Management and Maintenance (DCAMM). The purpose of this three year period MOU is to strengthen the State's commitment to economic growth and climate change mitigation, and to Lead by Example through the Governor's Executive Order (EO 15-17) that requires all State facilities to reduce their energy consumption, 10% by the end of fiscal year 2019 (June 30, 2019). Consistent with this EO, this MOU is designed to integrate strategic energy planning across State, and Quasi State, facilities, to leverage the Company's programs and best practices to achieve a minimum cumulative energy savings of ten percent (10%) below fiscal year 2014 levels by the end of fiscal year 2019. This MOU pertains to building projects (both retrofits and new construction) for State facilities.

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National Grid plans to assist the state SEMP with:

- Continuing to identify and prioritize projects from the more than two dozen scoping studies and retro-commissioning reports that have been completed thus far.

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- Working with agencies and purchasing departments to develop and request qualifications and proposals for the fiscal year ending June 30, 2019.
- Identifying remaining projects and proposing a budget for the remaining buildings to be included in the FY 2019 budget (due in January, 2018).

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In addition, National Grid will continue to offer building operator certification trainings.

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In 2019, National Grid will continue to provide scoping studies (energy audits) commissioning studies with the assistance of consultants, to create Request for Proposal documents coordinated with the agency and State purchasing. At this time, the Company is following multiple approaches to delivering energy efficiency based on building size and building function:

- For smaller buildings, multiple measures such as lighting, HVAC and others will be bid out (with assistance from lighting auditors and consultants) and installed in multiple facilities. This will provide economy of scale for buildings, typically by agency.
- For larger facilities, with similar needs (like lighting), multiple facilities and sites will be audited, specs written and an RFP will be developed and installed in multiple buildings.

e. Manufacturing/Industrial

The industrial sector accounts for one-third of the total U.S. energy consumption, and as such represents a substantial opportunity for cost-effective energy savings. Effectively managing and reducing industrial energy use has become a key priority for the Company.

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The Industrial Initiative was started in 2013 as a demonstration project and enrolled seven customers over the course of 2013 and 2014. In addition, this helped the Company build relationships and trust with its top industrial customers in Rhode Island. In 2015, National Grid formalized the program and expanded outreach to include 17 large industrial/manufacturing customers. From 2015-2018, XXX electric customers with complete or active projects in Rhode Island represent XXX annual MWh and XXX applications. Gas participation over the same period of time consists of XXX annual therms and XXX applications.

The National Grid Industrial Initiative assists busy plant managers identifying process improvements and energy efficiency projects. Tight budgets and limited staff time often make it difficult for businesses to take advantage of the savings these projects provide. The Industrial Energy Advisors' services are targeted towards large industrial facilities with significant electric and/or gas usage and are available at no cost to the customer. Unlike most commercial buildings, industrial facilities are likely to find that the majority of their energy consumption is production-related, instead of lighting or HVAC. The Industrial Initiative team focuses on process measures including:

- Free Cooling on Process Chillers
- Heat Recovery Projects
- Thermal Oxidizers
- Process Controls and Automation
- Drives, Motors, VSD Compressors
- Lighting Upgrades

As a result of the Industrial Energy Advisors' engagement, the proportions of process-related projects have increased, along with overall savings.

In 2018, the Company continues to maintain the key features of the initiative and results thus far have been extremely promising.

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Current program components and highlights:

- An industrial-specific technical expert team from the Company's specialty engineering partner provides support to its sales team and technical solutions to its industrial customers. These solutions include: process energy related measures, management change recommendations, project management support, and other HVAC and lighting related options.
- A scoping study of the technical and energy management opportunities for the facility, at no cost to the customer. If a detailed analysis, in addition to a scoping study, is required (e.g. a detailed compressed air study), the costs of the study are shared with customers on a case by case basis.
- An incentives package that addresses the needs of the individual customer to the greatest extent possible. Customer needs assessment: The sales team and the Company's engineering partner will conduct needs assessments in order to provide the best solutions for its customers. The Company recognizes that some customers may need more assistance in management

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of their energy, such as examining interval data anomalies and working to correct them (frequently scheduling or equipment setting errors) before implementing energy saving measures. National Grid will categorize customers based on their levels of engagement and will develop different implementation paths based on each customer's needs.

- National Grid will also provide project progress tracking and support to overcome implementation barriers.

In 2019, National Grid and its engineering partner plan to reach out to more customers as well as follow up with customers who have successfully completed projects to see if the company can help them solve additional problems.

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ii. Small Manufacturing/Industrial

The Company continues to serve small and medium industrial/manufacturing facilities through its large retrofit initiatives, including Upstream lighting and HVAC, in Rhode Island. However, the Company feels that this is still not sufficient. National Grid wants to bring the expertise and problem solving abilities of the Industrial Initiative vendor to customers in the 200kW-400kW average monthly demand segment. The Company will work to make sure that these customers are addressed in the contract extension negotiations with the Industrial Initiative vendor that are taking place concurrently with the crafting of this plan.

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a. Restaurants

The Company will continue to offer energy efficiency services to its small to medium sized restaurants through the Direct Install and Large retrofit/new construction programs. In addition to this, the Company will continue and expand with its strategy for chain restaurants that was started in 2016. The strategy was to approach a corporate office with an energy efficiency action plan that can be tailored to the needs of a particular chain. An MOU is then signed between the corporate office and the Company that outlines the plan. The ideal candidates for this initiative are chain restaurants, with 24/7 operations and a large number of stores. In 2016-2017 a large franchise restaurant in Rhode Island participated in this initiative specifically designed for chains and franchises. Eighty-eight restaurant locations have participated in this program so far, with total annual savings of 3,629,347 kWh from this initiative. Efficiency measures include: lighting, HVAC, refrigeration and restaurant equipment. In 2019, the Company will look to expand this initiative with other restaurant chains.

Deleted: <#>The Company also works closely with vendors and trade allies to support energy efficiency upgrades in these industrial facilities. In 2018, the Company will continue working towards identifying go-to market strategies for small medium customers, which makes up 90% of our commercial accounts. ¶

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b. Lodging/Hospitality

Lodging facilities in Rhode Island have participated in the Company's programs in the area of lighting. However, there is potential for more savings. In 2018 the Company researched similar utility hospitality programs in the U.S. Based on this research there are strong indication that a targeted and continuous offering to this customer segment can yield deeper and more comprehensive energy efficiency. In 2019 the Company will explore providing hospitality and lodging customers a comprehensive approach to energy efficiency specifically tailored to the hotel and motel market segment, including spas and resorts. The strategy will be to identify customers who are interested in installing EE measures in lodging facilities, provide site assessments to identify qualifying EE opportunities, determine savings, developing incentive applications and providing project management and oversight through the measure implementation process. Additionally the program will also promote DR opportunities to customers in this market segment.

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Deleted: The Company is researching several areas that could help this segment reduce energy consumption even further. The Company is looking at simple changes such as more efficient pool pumps to more complex interventions such as ozone or polymer bead laundry washing systems and efficient HVAC units. There is also the potential in room key controls for lighting, electronics, and HVAC that are very popular in hotels around the globe. The Company currently has offerings for some of these items and needs to further investigate other options. The Company plans to engage with other utilities that have robust efficiency programs in this industry to learn about go-to-market strategies in the hospitality/lodging sector.

iii. Specialty Buildings

a. Extended Care Facilities such as Nursing Homes/Assisted Living

The Company has, over the past few program years, investigated different ways to try and serve nursing homes, rehabilitation facilities, and assisted living spaces beyond simple lighting retrofits. The latest attempt included trying to share the cost of an experienced energy manager to help these customers jumpstart project development. It was not successful. The Company's investigations turned up three simple truths:

1. These facilities want to pursue energy efficiency and comfort upgrades to their facilities.
2. Nearly every one of these facilities did not have the resources to even consider a cost share of investigating energy efficiency opportunities, let alone act on them.
3. The Company did not have a tool, beyond the limited resources of National Grid's OBR, to help them deal with these issues.

However, there is now Commercial Property Assessed Clean Energy (C-PACE) as a tool. C-PACE further defined in the "Affordability and Financing" section below, allows customers access to low cost private capital for terms that greatly exceed most conventional business loans. It also allows the customer to capitalize all costs related to the project. This means that the Company now has a solution to the largest barrier to moving forward with deeper and broader efficiency measures in this segment. These

measures include, but are not limited to, HVAC improvements, envelope improvements, energy management systems, energy efficient laundry systems, and Combined Heat and Power (CHP).

b. Farm/Agriculture

A few years ago OER and National Grid began an effort to serve farm and agricultural customers in the state of Rhode Island. Under the informal agreement between OER and the Company an allocation of Regional Greenhouse Gas Initiative (RGGI) funds was used to perform audits at pilot farms, train auditors, develop a list of technically sound measures, and create a fund to pay for energy efficiency incentives for delivered fuels (oil, propane). National Grid agreed to cover electric and natural gas energy efficiency incentives in accordance with Company policies.

In 2016, audit reports and recommendations were delivered to all nine pilot farms. Several farms have commenced with installing measures and the rest are evaluating which measures are best for their specific situations. National Grid and OER also created co-branded marketing pieces for this initiative.

In 2018, National Grid along with OER sponsored a URI intern to develop an outreach strategy and an outreach plan to farms in Rhode Island. In 2019 National Grid will continue to support this internship to engage with farm and agriculture customers in RI. National Grid will also continue to offer audits and educational information regarding energy efficiency solutions tailored for farms and agriculture customers. The Company currently jointly markets with OER, via web, email and through the URI intern at farmers markets and will continue these efforts in 2019.

iv. Multifamily Sector

The Multifamily Initiative will continue to provide joint residential and commercial energy services to condominiums and apartment complexes for energy efficiency upgrades. The C&I program specifically offers incentives for master metered gas measures that typically include boiler reset controls and insulation and air sealing. The remaining areas are addressed through residential incentives via a common point of contact. In 2019 the multifamily program will serve customers like non-profits, group homes and houses of worship that traditionally did not fit within the predefined program structure. These efforts are being coordinated with the Residential New

Deleted: Starting in 2018 National Grid, the Rhode Island Infrastructure Bank (RIIB), and various parts of the RI state government, including the treasurer's office, will be working together to advance this solution in this customer segment. This new financing tool and increased attention from various stakeholders will help to dramatically increase the number and diversity of energy efficiency projects in this vertical segment.

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Deleted: National Grid's vendor for this program began calling a list of farm/agricultural facilities, provided by OER, to educate them about the program and encourage farms to complete an audit of their facilities. The Company will continue its efforts to market jointly via web, email and in-person at farmers markets to engage with farms, jointly with OER, in 2018

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Construction program, Multifamily Retrofit program and the Small Business Services program. The Company continues to anticipate a higher volume of projects in the multifamily new construction space to come through the C&I programs in the next few years.

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Wethersfield Commons, RI – Multifamily Energy Efficiency

In collaboration with National Grid, RISE contractors completed upgrades for participating residents, which included adding attic insulation and sealing air leaks throughout their units. Upgrades also included smart thermostats, that provided more comfort and control, exterior lighting improved safety and low-flow shower head reduced water use and energy efficiency for residents.

v. Approach to Other Market Sectors

Hospitals: The Company will continue to work with Rhode Island’s five largest hospitals (all under one partnership) through the multiyear Strategic Energy Management Planning (SEMP) initiative (refer to the SEMP section for more details). The medium sized healthcare facilities will continue to be addressed through the channel sales group.

Colleges and Universities: These are currently served through either the Company’s large commercial programs with a dedicated sales team or the Company’s SEMP initiative. With a master-metered portfolio of buildings within the campus, most

universities are tied to sustainability goals and climate action plans to reduce their greenhouse gas emissions. The Company's SEMP initiative allows enrolled university customers to engage in multi-year campus energy planning and assists them in identifying comprehensive and long-term energy efficiency opportunities. The Company will continue to explore opportunities for further SEMP university customers. Besides SEMP, the Company continues to provide energy services to universities in RI.

Commercial Real Estate and Offices: The Company's sales team continues to see many challenges and barriers in program participation of Commercial Real Estate (CRE) sector due to the split incentive between owners and tenants and difficulty accessing decision makers. There are three ways the Company will promote EE services to this sector:

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- Benchmarking: The Company will continue to refine its automated benchmarking capabilities in 2019. National Grid will work with partners such as the City of Providence, Chambers of Commerce, and other entities to ensure that customers are aware of the this tool, its benefits, and that it can help them see how their building's energy use compares to peers. After a facility has been benchmarked, National Grid has various resources to help its owners achieve lower energy consumption per square foot.

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- Commercial Property Assessed Clean Energy (C-PACE): C-PACE can be an ideal tool for some commercial real estate owners and developers. It allows them to finance energy and related improvements in a way that is widely considered "off book" and can be passed through to renters in many types of leases. To advance the use of this unique mechanism National Grid will continue to work with the RIIB and SRS to bring awareness to commercial building owners.

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- Sustainable Office Design: The Company will continue to market the "Sustainable Office Design" (SOD) initiative to address Class A type office spaces. The Sustainable Office Design (SOD) initiative promotes high-performance office lighting and controls for quick turnaround tenant fit-outs. This is an easy to use, performance-based design approach that benefits owners or tenants with energy savings depending upon the lease arrangements. A fixed incentive per square foot along with a pre-set design criteria and lighting designer incentives will provide easy participation for the tenant fit-out projects. In 2019, the Company will look for ways to engage and inform tenants and leasing agencies of this opportunity so that there is participation in this initiative.

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c. Education and Training

National Grid is committed to promoting leadership in the community, various market sectors, trade organizations and associations by providing and sponsoring initiatives and outreach efforts for education and training.

The Company, as in previous program years, will continue to support opportunities to inform customers and trade allies/vendors/contractors, which serve various market sectors, about existing and new or emerging energy efficient technologies, building systems and design, building energy codes and standards, improved installation practices, and up-to-date operation and maintenance (O&M) procedures. By integrating local, regional, and national educational and training initiatives throughout National Grid's various C&I programs, the Company hopes to build awareness about the benefits of energy efficient technologies, market National Grid's energy efficiency programs, provide expertise and experience on the need for integrated design, and improve construction and installation practices for an existing or new construction building project. This includes co-sponsorship of TEC-RI's training sessions. Information about National Grid's energy efficiency programs is also presented to members of several professional organizations including the Electrical League of Rhode Island and ASHRAE. Deeper energy savings, as well as other non-energy benefits, can be achieved for any given customer project when the customer, designer/engineer, or contractor/installer is able to express or share knowledge about an energy efficient technology, the associated costs, and energy savings potential.

i. Building Operator Certification Training (BOC)

BOC Levels I & II include HVAC, lighting and building controls. Students gain knowledge of their own building by completing projects involving documentation of building equipment, systems and controls, benchmarking the building's performance by using ENERGY STAR® Portfolio Manager™, updating occupancy profiles, reviewing HVAC systems and operation, and mapping the facility's electrical distribution system. In addition, the course addresses maintenance of building systems, equipment troubleshooting, preventive maintenance, advanced electrical diagnostics, and also HVAC optimization.

In 2019, the Company plans to support Building Operator Certification (BOC) training by holding at least two Level I BOC classes in Rhode Island and Massachusetts as well as

Deleted: <#>Commercial Real Estate (CRE): The Company launched a Commercial Real Estate pilot in 2017. The commercial real estate market offers a great opportunity for energy savings in National Grid's Rhode Island service territory. While Commercial Real Estate (CRE) is defined broadly to include retail stores, industrial parks and multifamily properties, office buildings were the primary targets of this initiative. Energy use is the single largest operating expense in commercial office buildings, representing one third of typical operating budgets. To encourage CRE customers to participate in National Grid's programs, the Pilot offers no-cost benchmarking services and technical support tailored to the CRE market. Benchmarking will be used as an introduction to energy efficiency for commercial building owners and managers who have not previously engaged with National Grid RI programs. ¶
The pilot is designed to overcome the market barriers specific to this sector, which include:¶
1) Lack of budget for staff that focuses on energy management.¶

Deleted: <#>Trade Ally Engagement (TRAEN)¶
Beginning in 2015, a Trade Ally Engagement (TRAEN) initiative was introduced to Rhode Island as part of an effort to reduce time in completing application forms for customers and contractors. This is a 48 hour pre-inspection service in which contractors

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[one Level II BOC class in Massachusetts.](#) Classes will be held in the spring and the fall.

The audience consists of facility managers, operating engineers, building technicians, and maintenance mechanics. The course provides a core foundation across the various building systems and maintenance practices of a typical commercial building – class instructors encourage class participation. In addition to the knowledge gained by listening to the instructors and completing both in classroom as well as out of classroom projects, the participants benefit from networking and learning from each other’s experiences with building maintenance and energy efficiency. At each new course, an overview of the Company’s commercial energy efficiency programs is given. Student satisfaction with the BOC training is high in that they would recommend it to others and their companies are likely to engage utility energy efficiency incentives for energy projects.

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[In addition to the classroom training, National Grid also sponsors BOC webinars for customers and staff. The webinars are on specific topics of interest to facility managers.](#)

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ii. Code Compliance Enhancement Initiative (CCEI) Training

CCEI includes in-person classroom and hands-on trainings, webinar presentations, project-specific technical assistance circuit riding, and [development and](#) dissemination of documentation/compliance tools like residential field guide, residential and commercial FAQs, technical bulletins, and case studies. CCEI focuses on ground-up new construction for residential and commercial buildings but also addresses additions, renovations, and retrofits. More details on this training are provided in the Large Commercial and Industrial Energy Efficiency Section under Building Energy Code and Appliance Standards.

iii. Advanced Workforce & Channel Development (Demonstration)

Online Trade Ally Training on Advanced Lighting Systems

Online Trade Ally targeted training that consolidates the best-of-class subject-matter expertise into one common platform with an electronic learning training program built to track the progress of participants. This online, on-demand learning platform will complement face-to-face and webinar based education, and is a proven way to meet the time demands of all trade allies. This online learning platform will provide efficient and effective education on Advanced Lighting Systems including controls and design. A well trained trade ally network will increase customer satisfaction while also increasing energy savings.

Deleted: CCEI includes: ¶
<#>In-person classroom and hands-on trainings¶
<#>Webinar presentations¶
<#>Project-specific technical assistance circuit riding¶
<#>Dissemination of documentation/compliance tools like¶
<#> residential field guide¶
<#> residential and commercial FAQs¶
<#> technical bulletins¶
<#> case studies¶

Utility Benefits	Trade Ally Benefits
<ul style="list-style-type: none"> • Automates onboarding tasks • Deploys program changes faster • Pushes fresh content to engage allies • Provides metrics for ally tiering programs • Shares in industry-provided content • Uses portal customized with utility branding • Increased energy savings from knowledgeable trade allies 	<ul style="list-style-type: none"> • Offers training access organization-wide • Educates all staff to increase project sales • Affords on-demand training when needed • Offers accredited CEU and certifications programs • Aligns real-time trainings with program changes • Recognizes achievement with rewards • Reports real-time metrics to track progress

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d. Affordability and Financing

Over the past few years, the Company along with the State and Council, have made progress researching, planning, and developing opportunities for finance mechanisms that will help customers overcome cost barriers and promote affordability for investments in energy efficiency. This section outlines ongoing efforts to study, plan, coordinate and offer financial products that meet customer needs and assist in delivering energy savings.

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National Grid believes that financing plays a critical role in meeting efficiency and other goals; and it is critical to think creatively about the future roles for incentives, the revolving loan fund (OBR), and other financing mechanisms; and the need to explore potential opportunities for leveraging public funds. Fortunately, as the focus on financing has increased, so has the number of market mechanisms available for funding efficiency projects. The Rhode Island Infrastructure Bank's Efficient Buildings Fund (EBF) and Commercial Property Assessed Clean Energy (C-PACE) programs, third party finance products, Pay as You Save (PAYs) programs, Metered Energy Efficiency Structure (MEETS), and others offer unique benefits and opportunities. Understanding these products, their ability to meet customers' financing needs and how to harmonize them

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so that customers can understand and choose their best option is an important focus of the second year of the 2018-2020 Plan.

National Grid believes a firm foundation for this work was laid in 2017. The Company engaged in multiple discussions with internal and external stakeholders including discussions with the Council, the EEMRC and a full day *technical session* with the PUC. External stakeholders included the OER, RIIB, the EEMRC consulting team and their financial consultants from Dunsy Energy Consulting (Dunsy) and Rhode Island Housing. Many ideas were discussed in these various meetings, but three overarching ideas/questions came through:

1. How can financing be used to increase participation?
2. How can financing encourage customers to move beyond lighting?
3. How can financing be used to reduce program costs in the long term so that the programs can accomplish more with less/ same?

In many cases achieving all three things is not possible with the same customer, but it does not mean that we cannot pursue these ideas separately or in combinations across our entire customer base.

The Company has learned a great deal since those meetings and the technical session, which the Company will highlight below. National Grid will also detail existing finance mechanisms and what is planned for them in the coming year. In addition, National Grid will provide details about our cost reduction test within OBR, things that we have learned from this pilot, and future plans regarding this test and others that may occur in the future.

Lessons learned:

- Awareness matters
- Meet customers where they are and challenge them
- Sales tools and training matters
- Sequence of presentation matters
- Type of customer matters

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<#>You will hear more about all these efforts below

Deleted: The Company also carried out research projects related to the historic and potential uses for OBR, and created a model to estimate funding requirements under various market scenarios. These frank discussions and related research led to the identification of three informal objectives that seemed to resonate with internal and external stakeholders that need to be tested and validated. They are: 1) increase comprehensiveness, 2) reduce incentives, and 3) Increase participation by improving access to cost-effective financing for all customers. The extent to which these objectives are attainable for a variety of customers, to be based on what criteria, and in what time duration must now be explored. In 2018, the Company will continue on that path, first by analyzing the lessons learned to date, and then by developing and implementing informed pilots to test hypotheses.

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As described in the 2018-2020 Plan, the Company will pursue the vision of providing an array of appropriate financing options so customers can choose that which is most advantageous in each situation. The Company recognizes the need to dive deeply into enhancing financing mechanisms for all sectors. Residential finance opportunities are discussed in Attachment 1.

On the C&I side, the focus in 2019 will continue to be on large C&I, i.e. customers with annual usage greater than 1,000,000 kWh. Small business financing explorations will follow in subsequent years, benefiting from the learnings with larger customers. Specific activities will support action items defined in the Three-Year Plan and will include some of the following focus areas:

- Collaboration – National Grid agrees with a statement in Dunsky’s Three-Year Plan Review, “National Grid’s work with the EERMC, the Collaborative, and other stakeholders continues to be key to the success of energy efficiency activities in the state.” To that end, in 2019, National Grid will continue to meet with members of the EEMRC and the Collaborative, as well as other stakeholders. The intent is to socialize ideas and foster collaboration on appropriate activities. Common reporting frameworks – Developing a set of common reporting metrics that provide transparency in the allocation of funds, consistency in reporting of customer transactions throughout the process, funding allocations and spend, etc. will provide valuable information for assessing and planning future activities. In 2018, National Grid will pursue these goals with the State, the Council and RIIB. The objective is to create common sense guidelines that will enhance understanding and collaboration between organizations and help shape financial programs and offerings going forward.
- Understanding Product Offerings – Looking across the array of products already available and those under development can be confusing. Each one operates under a different structure (where the funds come from, how they are dispersed, etc.), requires different things from the customer (MOUs, Municipal Council Approval, follow-up data tracking, energy management plans, etc.), operates on a different cycle (e.g. semi-annual bond offerings), sets different financial limits, is available to limited segments of the market, and other varying characteristics/features. Gathering all this information into one place would be very helpful in identifying the market segments, customer types, and/or project characteristics where each might be most successful.

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Deleted: The Three-Year Plan discusses the limitations of relying too heavily on incentive based financing and identifies strategies to improve current financing tools, determine where gaps exist, and develop pilot efforts to test out these ideas. The task is a large one, and discussions and group engagement have already begun.

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Deleted: Initial meetings might be scheduled, where possible, before the end of 2017. Initial topics for discussion may include common reporting frameworks and potential OBR enhancements and pilot efforts.

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To this end, National Grid will work to develop an inventory of financing products and make it available to RIIB and other external parties. In addition, to help avoid confusion in the market, the Company will collaborate with RIIB and other Stakeholders to develop basic marketing messages – based on clear, concise, and consistent language – that can be used by all those promoting financial tools to customers and vendors. Engage Customers – As the Company comes to understand the various products...

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Deleted: <#>Pilot Changes to OBR – Discussions in 2017 highlighted opportunities to enhance the OBR ...

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2019 will be another pivotal year for financing in Rhode Island. It will be critical to assess and develop finance options that push forward deeper dive efficiency improvements that will help meet ambitious energy savings targets in the future and, at the same time, leverage those in place. Several of the existing options are described in more depth below.

i. Rhode Island Infrastructure Bank – Efficient Buildings Fund

The Efficient Buildings Fund (EBF) is a long-term, low cost financing program for local governmental units, including quasi-state entities to invest in clean energy projects. EBF is administered in partnership between the Rhode Island Office of Energy Resources (OER) and the Rhode Island Infrastructure Bank (Infrastructure Bank or RIIB). The EBF was created in 2015 with input from National Grid and a variety of stakeholders, many of which belong to the Rhode Island Energy Efficiency Collaborative. OER is responsible for determining project eligibility, reviewing project applications and producing a project priority list (PPL). The Infrastructure Bank only finances projects at sites that are listed on the PPL. OER, the Infrastructure Bank and the National Grid municipal sales representative work together to originate efficiency projects that meet the requirements of least cost procurement. EBF also provides financing for renewable energy projects and uses other forms of capital to support those transactions. The Infrastructure Bank does not receive an annual allocation of capital from the State of Rhode Island to support the program.

Placeholder for relevant EBF history

Placeholder for expected savings and demand from RIIB and OER In 2019, \$5.0 million will be provided to EBF for an additional round of EBF financing. Based upon available resources and demand, the Infrastructure Bank expects to leverage the provided funds between two to five times. They project these 2019 financings will return energy savings of no less than XXX Annual MWh and XXX Annual therms. Additionally, to support the Infrastructure Bank's success, National Grid may fund approximately \$100,000 in technical assistance studies and OER will assist municipalities with automatically updating their Portfolio Manager accounts for EBF building benchmarking and reporting requirements. National Grid will also incentivize the cost-effective efficiency projects for electric and gas retrofits with direct incentives to EBF customers.

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Deleted: <#>On Bill Repayment (OBR)¶
For large C&I customers the Company will continue to offer finance to help pay for customer costs through OBR from revolving loan funds. National Grid finances the customer portion of electric or gas efficiency projects, on bill, for up to five years at 0% interest. OBR offers easy access to finance as well as creates reduced customer transactional friction by easing the repayment process by offering the repayment of the loans on the electric bill. All customers are eligible for OBR.¶

The Company's evaluations and experience with changes in OBR lending strategy indicate higher customer demand for OBR than might be readily inferred from OBR's past spending history. In 2017, the Company is projecting approximately 150 customers and their branches requiring up to \$12 million to finance their projects. The Company also forecasts financing and/or committing OBR to customers at similar levels in 2018. ¶
National Grid is not requesting a LC&I OBR fund infusion in 2018, however. There are two reasons. First, a fund transfer will be approved in 2017 by the Division of Public Utilities and Carriers and the EERMC to support continued OBR availability through 2018. Second, the ...

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Deleted: EBF closed round 1 of project financing in July 2016, funding approximately \$18 million of projects. This project funding for 2016 was ...

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Legislation has been, passed that clarifies the Infrastructure Bank's authority to finance projects for all local governmental entities, including quasi-state entities. OER, the Infrastructure Bank and National Grid have developed a pipeline of projects expected to be financed through EBF in 2019, and beyond, having developed more frequent application periods throughout the year. OER has also updated the EBF project regulations to allow for new construction projects to be financed through EBF. Additionally, OER, the Infrastructure Bank and National Grid's municipal sales lead have been meeting with town councils across Rhode Island to educate the councils on the benefits of investing in clean energy projects. This additional education to the city and town councils across Rhode Island is an opportunity to showcase the EBF and benefits of investing in comprehensive energy efficiency projects.

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In September 2017, the Rhode Island Department of Education (RIDE) released an assessment on the condition of Rhode Island's public school facilities. The condition assessment identified \$2.2 billion in investment needed to be made by Rhode Island school districts to bring the conditions of our public schools to current day standards. Many of the recommended improvements will involve energy efficiency investments and EBF will be a critical component to enable school districts to upgrade their facilities.

In late 2018 the voters of RI will be asked to vote on a \$250 million bond that will touch many aspects of education in Rhode Island. The Company believes that a significant portion of this money will be used to improve the physical conditions of RI schools. Some of this money will, in turn, be used for energy efficiency improvements in existing schools and ensuring that new schools are both great learning environments and energy efficient.

National Grid believes that there is a significant energy efficiency potential if this bond is passed at the state level and if towns also approve spending through their municipal processes. However, National Grid also believes that the full potential of EBF will not be realized until School Housing Aid and EBF are made fully compatible.

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Funds allocated to the EBF, including interest earnings, will be used in accordance with least cost procurement law, the EBF enabling act (Chapter 46-12.2), and regulations filed by the Office of Energy Resources and Rhode Island Infrastructure Bank governing the administration of the program. The Bank administers the EBF as a revolving loan fund, making loans from time to time for eligible projects, and tracks the funds awarded

under the Plan independently of other sources of funds which provide additional capital for the EBF program.

Additionally, National Grid and the EBF administration team have agreed to deliver a common quarterly reporting framework for EBF based upon feedback from the Public Utilities Commission. Information is communicated in National Grid's quarterly reports. Information will include the status of funds managed at the Infrastructure Bank (funds lent, returned, committed and available). National Grid, RIIB and OER will continue to have regular communication channels to monitor savings performance of the EBF energy efficiency projects, consistent with National Grid's commitments to transparency and reporting.

ii. Commercial Property Assessed Clean Energy (C- PACE)

C-PACE is an innovative way for customers to obtain long- term low-cost financing for energy efficiency, clean energy and other building improvements in their privately owned businesses or non-profits. Importantly, C-PACE offerings are financed through private capital and do not necessitate an allocation of ratepayer dollars. Voluntary assessments for repaying municipal bonds have been attached to property taxes since the early 1800s to fund projects for public good such as sidewalks, fire stations, and street lighting. The C-PACE financing repayment is facilitated through the same municipal property tax assessment process. A voluntary assessment (similar to a sewer district assessment) is placed on the building owner's property tax bill. The assessment is repaid over the financing term (up to 25 years, project dependent). Given that longer term, and depending on the mix of energy efficiency and other projects, the annual energy cost savings can exceed the annual assessment payment, thereby enabling capital intensive equipment upgrades.

National Grid has been working closely with RIIB and its program administrator Sustainable Real Estate Solutions (SRS) and other stakeholders to launch a successful C-PACE program in Rhode Island. Recently, the Company's work with RIIB and SRS has included meetings to work through the process of making sure that:

1. National Grid sales staff understands the fundamentals of the C-PACE program and where it can be effectively used.
2. National Grid vendors understand the fundamentals of the C-PACE program and where it can be effectively used.

Deleted: National Grid has participated in a series of meetings to educate RIIB and SRS in the basics of how the Company's programs operate and to assist the Infrastructure Bank and SRS in developing the initial program guidelines. The Company also led a day long charrette and series of meetings to talk about the how the C-PACE program could be integrated into the sales process of National Grid staff and its turnkey Project Expeditor (PEX) vendors. ¶

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3. SRS and other RIIB vendors understand the fundamentals of National Grid energy efficiency programs and where EE projects will benefit C-PACE customers.

4. There is a plan to seed the commercial market with awareness of this unique product.

The Company believes that C-PACE and other publicly-funded financing mechanisms could fundamentally change the way customers think about efficiency upgrades, allowing them to bundle projects in ways they had not considered viable prior to this point in time. As such, the Company is pleased to commit to an ongoing collaboration with RIIB including common reporting requirements, continued financial and technical support as described above, and regular meetings and communication. The Company recognizes that this on-going coordination will help forge a strong partnership from which to promote comprehensiveness, address market barriers and enhance value for customers.

Deleted: Mapping out the steps of exactly how the program will work with the many ways that customers may start their interaction with National Grid.¶

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iii. On Bill Repayment (OBR) – Work Ongoing

For large C&I customers the Company will continue to offer financing to help pay for customer costs through OBR from revolving loan funds. National Grid finances the customer portion of electric or gas efficiency projects, on bill, for up to five years at 0% interest. OBR offers easy access to finance as well as creates reduced customer transactional friction by easing the repayment process by offering the repayment of the loans on the electric bill. This method of financing is considered off book by many customers. All customers are eligible for OBR.

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<#>On Bill Repayment (OBR) – Work Ongoing¶

The Company's evaluations and experience with changes in OBR lending strategy indicate higher customer demand for OBR than might be readily inferred from OBR's past spending history. In 2017, the Company is projecting approximately 150 customers and their branches requiring up to \$12 million to finance their projects. The Company also forecasts financing and/or committing OBR to customers at similar levels in 2018.

- Pilot Progress in OBR – In last year's plan the Company hypothesized that we could use the attractiveness of the OBR mechanism to achieve a number of goals including incentive reduction and increased measure adoption beyond lighting. The company chose to focus on cost reduction first.

In early 2018, the Company carved out a ~1/3 of the available OBR funds to be used under the rules of what the company calls "Financial Test 1." The objective of this test was to determine if customers would be willing accept a lower incentive amount if they were allowed to "finance" the balance of their projects costs with OBR.

Customers were given the choice of a "normal incentive" (prescriptive or \$/MWh for custom) or a 15% reduction in the normal incentive amount with the ability to "finance" the remaining project costs through OBR.

The Company has offered this choice to XX customers to date. XX chose to move forward with the "normal incentive" and XX customers chose to forward with the 15% reduction and financing.

To date this has reduced incentives by \$XX.

The company plans to continue this test in through the remainder of 2018 and, at a minimum, through 2019.

National Grid has learned three things from interviewing sales people and reviewing the data so far.

1. The option of the lower incentive is rarely selected by customers who have already experienced the "normal incentive" and OBR before.
2. The order of presenting the offers is critically important. If the customer is offered the combination of reduced incentive and financing after the original incentive offer they feel like they are "being cheated" or being "charged interest in another form."
3. We have very little information on what type of financing mechanism a customer uses, if any, if they choose the "normal incentive." Many customers are unwilling to share this information with us or simply don't know.

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The Company does not plan to ask for an OBR fund injection in 2019. There appears to be sufficient funds in the revolving loan fund to support the numbers goals proposed for 2019 in the three year plan.

The Company began committing finance for large commercial gas efficiency projects in 2015. These funds are in various stages of the finance process and a fraction of the funds are available to repurpose and commit to customers each year. The gas revolving loan fund has increased to approximately \$1.3 million and the Company plans to maintain this level in 2019. (Further refinements in the restaurant and hotel initiatives for the second draft may require an injection in this area.)

For small business customers, the Company continues from past years' successful experiences to offer on bill repayment for the customer portion of the project over 12 or 24 months. Due to changing ways in which energy savings are delivered to small business customers, the Company has more customers opting for the 24-60 month option, thus diminishing repayments in future years. However, the Company projects the fund will be able to sufficiently finance the planned 2019 small business customer demand. National Grid's revolving loan fund projections for 2019 are illustrated in Attachment 5, Table E-10 and Attachment 6, Table G-10.

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Third Party Finance Products

National Grid is committed to providing financing solutions designed to accelerate sales and remove project cost barriers. Financing energy efficiency upgrades can provide business customers with positive cash-flow in part because the value of the savings can be quantified and is often more than the cost of financing. However, customers may need assistance finding the capital required to help them invest in energy efficiency. In addition, the approval process and conditions attached to traditional bank financing are such that many customers are deterred from borrowing.

In 2017 National Grid in MA went through a competitive RFP process for third party finance solutions and partnered with Ascentium Capital, a national equipment financing company, to introduce a solution for large C&I customers. Instead of using the entire incentive from National Grid to buy down the capital cost of the project, this new offering enables customers to direct a portion of their incentive to buy down the interest on a loan to zero, they receive from Ascentium Capital; the remainder is used to buy down the cost of the project and reduce the principal required. Ascentium provides a streamlined experience for customers, with quoting tools, applications, approvals, and documentation occurring online. Loans for commercial entities are available from \$10,000 up to \$1.5 million (preferred loan sizes are \$50,000 to \$250,000) and in terms from one to five years; municipal financing is also available in higher values.

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Instead

In 2018 National Grid's sales representatives were trained in the use of this mechanism. The mechanism has been offered to many customers, but only one customer has proceeded to completion so far.

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3. Commercial and Industrial Energy Efficiency Programs

The C&I Energy Efficiency programs are organized in the same way as the built environment – customers are making decisions around their investment in higher performing new construction and existing buildings. Depending on the needs and size of the customer within each of the segments, customers can participate in one of four main energy efficiency programs. In 2019 Demand Response will be offered as another program that will support peak reduction strategies to both large commercial customers and small to medium business customers.

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- The Large Commercial and Industrial New Construction Program
- The Large Commercial Retrofit Program
- The Small Business Direct Install (SMB/DI) Program
- Demand Response Program (C&I Connected Solutions)

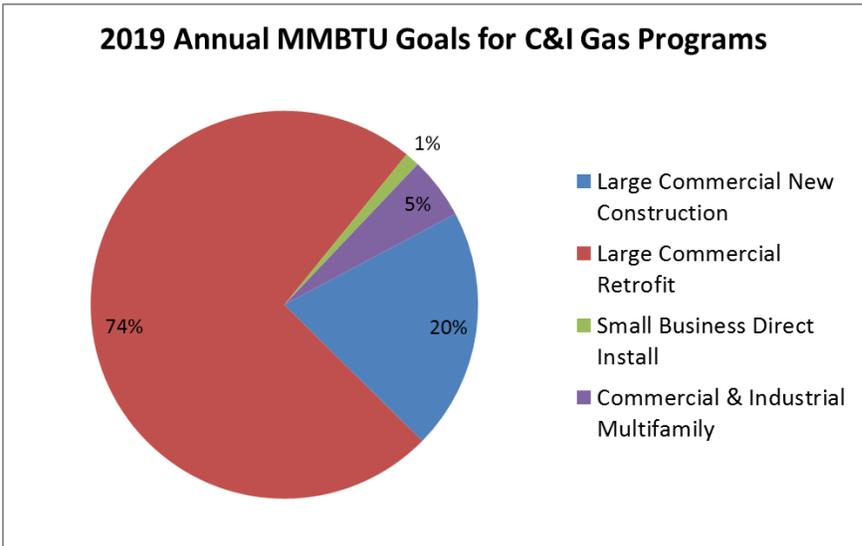
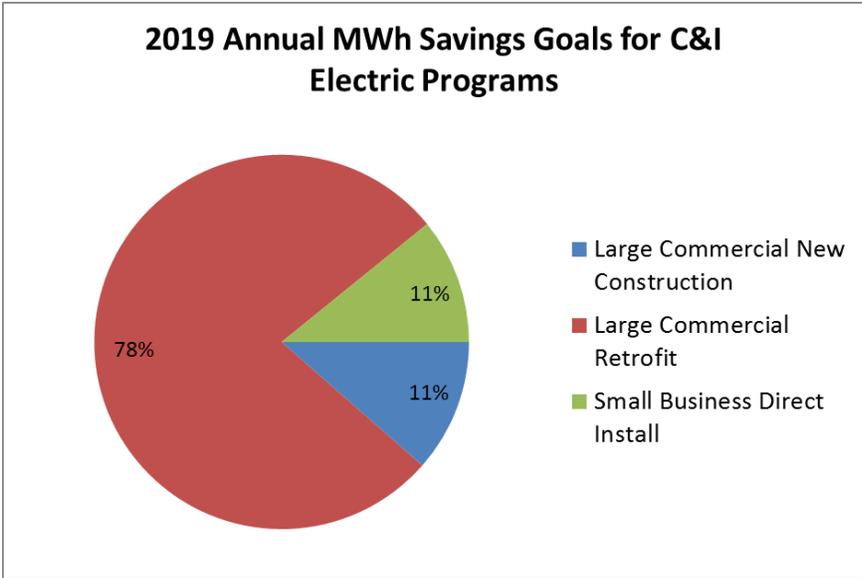
Although there are four energy efficiency programs in the C&I sector, all C&I customers are eligible to participate in the Large Commercial and Industrial New Construction Program and the Large Commercial Retrofit Program. However, the Small Business Direct Install (SMB/DI) Program is restricted to customers who consume less than 1,000,000 kWh per year. Larger and more complicated measures not offered by the SMB/DI vendor go through the New Construction or Retrofit Programs. The following sections describe the various offerings under these three programs. In addition, a logic model describing the C&I programs and how they relate to short and long-term outcomes is provided in Appendix 2 and 3.

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Commercial and Industrial Electric and Gas Goals by Program



4. Large Commercial and Industrial New Construction Program

a. Overview

The new construction program is divided into two main categories:

- 1. New buildings, major renovations and tenant fit-ups:** This is specifically for those projects that are ground up new construction or major renovations, all of which traditionally involve some level of design and are governed by code. The section below describes this in detail.
- 2. End of life replacements:** Typically with this category there is no design component. Customers purchasing new energy-consuming equipment, or replacing equipment that has reached end of useful life. But rather measures are governed by codes and standards in some cases because it has reached the end of its life. Customers are encouraged to make efficient choices with every category of equipment purchase. The baseline energy is considered to be the energy code and savings are calculated from the baseline energy. This works the same way as the “systems approach” described below, whether through prescriptive or custom pathways

2019 Goals

For the 2019 Annual Plan, Large Commercial and Industrial New Construction has the following goals:

Electric

Demand Reduction (Annual kW)	Energy Savings (Annual MWh)	Customer Participation
1,368	10,597	139

Gas

Energy Savings (Annual MMBtu)	Customer Participation
42,536	105

Deleted: End of life replacements: Typically with this category there is no design component. Customers purchasing new energy-consuming equipment, or replacing equipment that has reached end of useful life. , but rather measures are governed by codes and standards in some cases because it has reached the end of its life. Customers are encouraged to make efficient choices with every category of equipment purchase. The baseline energy is considered to be the energy code and savings are calculated from the baseline code. This works the same way as the “systems approach” described below, whether through prescriptive or custom pathways

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b. New Buildings, Additions, Major Renovations and Tenant Fit-Ups

The services and incentives offered are designed to promote and support high performance building design, equipment selection, and building operation. This program offers both technical assistance and financial incentives based on projected energy savings performance to incentivize building beyond the current energy code baselines. Technical assistance ranges from simple plan review and efficiency upgrade recommendations to complete technical reviews of energy models. In addition, the Company is utilizing existing energy efficiency technical assessment studies to provide engineering support to potential applicants for Advanced Gas Technologies (AGT) incentives.

The Large Commercial and Industrial New Construction Program offers two approaches for ground up new construction or major renovation projects:

- **Systems Approach:** The Systems Approach is designed for individual measures and for those projects applying later in the design process and which are generally focused on one or two energy systems to increase efficiency.
- **Whole Building Approach:** The Whole Building Approach takes into account a comprehensive analysis of all building measures together and requires collaboration between National Grid and the Design Team from the conceptual design phase through project completion. It encompasses consideration of all energy saving opportunities, including shell, fenestration, equipment and system interactions.

i. Systems Approach for New Construction

There are a few ways a customer can take advantage of the New Construction Program using the “Systems Approach.”

- 1.a. Prescriptive Path:** The prescriptive path is the quickest and simplest way to participate in the New Construction Program. This is used for equipment that is commonly replacing less efficient equipment and for which savings data is available due to the length of time the measure has been in the marketplace and the number of installations is large enough for there to be a representative sample. A fixed dollar amount is paid to the customer for replacement of a specific piece of equipment.

1.b. Custom Express Path: The custom express path is used when a measure may be relatively new to market. It is a more streamlined approach than the custom path. Custom Express refers to a suite of calculation tools available for TA vendors and partners which utilizes pre-approved methodologies, industry standards and engineering best practices. A Custom Express tool is used to determine the project's eligibility for an incentive on a case by case basis. This path can be used in conjunction with the New Construction Program but it is more commonly used for Retrofit applications. The amount of the incentive for a measure going through the custom express path can vary from project to project based on projected savings.

1.c. Custom Path: For customers who wish to achieve deeper and broader savings compared to prescriptive offerings, a custom path is available. This involves a more complex engineering analysis and is frequently used by customers considering complex HVAC equipment and systems. Custom incentives for new construction projects are designed to cover up to 75% of the incremental cost between standard and premium efficiency equipment.

The sales team has the flexibility to offer incentives that can be negotiated with customers. The Sales staff determines how to negotiate, based on the customer's financial needs. This approach helps the Company to maintain cost control with program budgets.

In 2019, the Company will continue offering custom gas and electric measure options. (Please refer to the appendix at the end of this attachment for a sample of custom measures.)

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ii. Whole Building Approach for New Construction

Under the "Whole Building Approach", there are two main pathways for customers who choose to do comprehensive and integrated designs for their projects.

2.a. Integrated Design Approach is most applicable for buildings that are greater than 100,000 square feet or buildings smaller than this size that are not a good fit for the Design Express path. Both owners and design teams are eligible for incentives on projects that perform 15% better than the energy code. Customer incentives are based on kWh and Therm savings. Incentives are capped at 75% of the incremental cost of the energy saving measures. A fixed incentive is also offered

to design teams for attending a design charrette/workshop that will enable them to incorporate energy efficiency early within the project stages. In addition, design team incentives are awarded for achieving energy savings that is 15% above the energy code savings target.

2.b. Integrated Design Express: This pathway is for smaller buildings in the 20,000 to 100,00 square feet range. Both owners and design teams are eligible for incentives on projects that perform 15% better than the energy code. Customer incentives are based on kWh and Therm savings. Incentives are capped at 75% of the incremental cost of the energy saving measures. In addition, design team incentives are awarded for achieving energy savings that is 15% above the energy code savings target.

Operational Verification

To ensure energy savings projects are installed and operated as designed, the Company will continue to provide operational verification service in 2019, as in previous program years. This service will continue to be served by independent third-party vendors for verification of complex building systems, including HVAC projects involving energy management systems or other controls, ensuring proper installation and operation as designed. National Grid requires all projects which receive an incentive over \$100,000 to undergo operational verification. This service is also promoted for projects where the savings are dependent on control measures or operational improvements. National Grid typically provides these services at no cost.

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c. Initiatives specific to New Construction Program

Specific initiatives are listed below within the New Construction Portfolio that address the unique needs of the New Construction market sector:

i. Building Energy Code and Appliance Standards

Overview

National Grid is one of a few utilities that have been allowed to claim energy savings for supporting progress related to the building energy code. The Company launched its Code Compliance Enhancement Initiative in 2013 and has been claiming savings for building energy code compliance support activities since 2014. The Company has also

provided technical assistance for proposing new and improved appliance and equipment standards regulations for the State.

The Codes and Standards initiative is an innovative efficiency offering that saves energy on behalf of customers by: 1) intervening strategically in the construction industry to improve compliance with the state building energy codes, and 2) strengthening energy efficient energy codes and product standards.

2019 Focus

Commercial Codes Savings:

Savings listed below are included in the 2019 Goals listed for Large Commercial and New Industrial Program

Electric: Energy Savings (Annual MWh)	Gas: Energy Savings (Annual MMBtu)
277	343

While the State’s deferred update to a more efficient building energy code and an increase in compliance with its current code continues to reduce the potential savings for this initiative compared to previous years, the Company will focus its efforts toward remaining compliance gaps. For the first time, The Company will also directly support the State’s adoption of an updated base energy code and the use of the State’s newly developed stretch code.

As for appliance and equipment standards, the Company proposes to continue its support of advanced state-level standards as well as supporting (where opportunities exist) the development of national standards.

Energy Codes:

The Code Compliance Enhancement Initiative (CCEI) is a focal point of the C&S initiative. The CCEI includes robust stakeholder engagement and industry group outreach, in-person classroom and hands-on trainings, project-specific technical assistance circuit riding, development and dissemination of documentation/compliance tools, and other services.

A 2016 compliance evaluation study for commercial projects found that compliance rates increased from about 70% with the state’s previous 2009 IECC-based energy code

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- Deleted: The Codes and Standards initiative (C&S) is an innovative efficiency offering that saves energy on behalf of customers by creating: 1) an environment that achieves greater compliance with the state building energy codes, and 2) strengthens and promotes energy efficient appliance standards and accompanying consumer purchasing incentives. Two components of the codes work are described below:
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- Deleted: The CCEI will be entering its fifth full year in 2018 and will continue to build upon the successes of previous years.
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to about 86% compliance with the current 2012 IECC-based version. In 2019, the Company will continue to deliver commercial energy code trainings focused on remaining code compliance gaps while supporting Rhode Island's anticipated transition to 2015/2018 IECC. Pending the passage of enabling regulations, the Company will also continue to work with the RI Building Code Commission to accommodate third party energy code specialists as optional energy related building inspectors for applicable projects undergoing the permitting process.

Deleted: . An analogous 2017 study for residential projects showed similar results. Results of both studies have been leveraged to:
analyze the impact of CCEI trainings to improve compliance;
update the savings calculation method based on new compliance numbers; and
inspire new ideas to further improve compliance.... In 2019,
...

Stretch Code support:

In 2017, the Company guided the finalization of the stretch code for commercial buildings. In 2019, the Company's stretch code support will continue as follows:

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Deleted: The Governor's December 2015 Executive Order "State Agencies to Lead by Example in Energy Efficiency and Clean Energy" required OER to coordinate with EERMC, National Grid, and the Green Building Advisory Council to establish a voluntary or "stretch building code" that is based on the International Green Construction Code or equivalent by 201...

- Provide technical expertise on energy related requirements
- Conduct stretch code specific trainings along with the base code trainings (as detailed in section above)
- Align the Company's new construction program with stretch code specifications as much as possible
- Advocate for increased use of the stretch code and work with the Company's customers to achieve the stretch code requirements.

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ii. **Appliance and Equipment Standards:**

Over the past few years, the Company has worked with associated stakeholders to spur the adoption of new product standards. While 2018's effort advanced further than previous attempts, the required legislation to cement this effort was not passed by state legislatures. The Company will continue to advocate for State appliance legislation in 2019, and provide technical support regarding such parameters as market potential, energy savings, and life-cycle cost analysis. The Company also proposes to directly pursue opportunities to partner with efficiency program administrators in California and beyond in advocating for federal appliance standards.

Deleted: <#>Work with the internal evaluation team to develop a mechanism to claim savings for stretch code projects. ¶

Deleted: Historically, the goal of this initiative has been to accelerate the development and adoption of selected new appliances as State level standards (better energy performance than federal standards), thereby increasing the ...

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iii. **Energy Efficiency Integration with Solar**

In 2019, the Company will continue to work to align its energy efficiency programs with the solar offerings in Rhode Island in order to help customers achieve zero-energy buildings. The Company will also work with the Office of Energy Resources' lead on the state's zero-energy initiatives pursuant to the Zero Energy Building Pathway to 2035 –

Whitepaper Report of the Rhode Island Zero Energy Building Task Force (2016).
(https://www.nationalgridus.com/media/pronet/ri-ee-task-force/cm6459-ri-zne-white-paper-12_16.pdf)

iv. Performance Based Procurement Initiative

The Company, in 2018, launched a new initiative under New Construction Program called Performance Based Procurement. Performance based procurement is a commercial new construction program enhancement that encourages building owners and developers to specify energy performance targets and include them in the project request for proposals. The design and construction teams are selected based on their ability to meet energy performance targets. Performance-based procurement holds teams contractually accountable throughout design and into occupancy, resulting in actual performance and verifiable energy savings.

Performance based procurement results in deep, fully realized energy savings beyond prescriptive code minimums. This increases value to the building owner and delivers greater savings to the new construction sector, where advancing energy codes and standards make energy savings goal achievement more challenging.

Value to Customers:

- Technical assistance to establish project energy requirements and evaluate team submittals.
- Procurement language that integrates into existing RFP and contract documents.
- Easy-to-use processes from RFP through building operations.
- Connection to financial incentives, OBR and C-PACE, including incentives based on post-construction measured energy performance.
- Training and resources that allow owners to replicate this approach across a portfolio of buildings.

This initiative was launched in 2018 and will continue in 2019.

v. Indoor Agriculture Initiative

In RI, there are currently 3 dispensaries for medical marijuana with no plans to expand that number anytime soon. Savings opportunities for indoor agriculture are limited to

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<#>Zero Energy Demonstration Projects ¶
<#>Zero Energy Buildings (ZEBs) have the potential to strongly support Rhode Island's greenhouse gas emissions reduction goals. ZEBs minimize their overall energy consumption through innovative designs and energy efficiency measures. Renewable energy technologies are then used to generate the remaining annual energy needs of the building. ZEBs can be homes, businesses, or other facilities. ¶
<#>As the largest utility in Rhode Island, National Grid has an integral role to play in enabling and accelerating the adoption of ZEBs in the state. In 2015, National Grid developed a whitepaper with input from key stakeholders for achieving ZEB goals by 2035.³ Recommendations in the whitepaper included establishing policies and legislation that support ZEBs, launching a state-wide ZEB program across all building sectors, and enhancing utility energy efficiency programs to spur the ZEB market while addressing energy efficiency and renewable energy integration barriers. National Grid is committe(...

Deleted: is looking at a new approach to new construction projects

Deleted: A new opportunity is emerging in Rhode Island around indoor agriculture or cannabis production. The common indoor warehouse production facilities can use 6x – 8x as much energy per square foot as an office building. This presents outstanding opportunities for energy efficiency, primarily focused on (...)

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the grow facilities associated with these 3 dispensaries. The Strategic Sales team will continue outreach efforts to these facilities.

In addition, the legalization of recreational marijuana has had no movement in RI. In MA, as of July 1, 2018, recreational marijuana is now legal, but only a couple of licenses have been issued.

vi. **Exterior Performance Lighting and Controls**

The goal of this initiative was to extend the Company's existing performance lighting offering (currently offered to new and retrofit projects) to exterior lighting applications. Through this initiative, the Company plans to encourage:

- a. An understanding of exterior lighting codes
- b. Code based lighting controls for exterior projects
- c. Code based exterior lighting design that promotes best practices while saving energy.
- d. Lighting designers to understand exterior lighting codes, and to design to exceed code through innovative designs and technologies

In 2017 this initiative was incorporated into the Performance Lighting program. See section 5g.

Large Commercial Retrofit Program

a. Overview

The Large Commercial Retrofit Program serves the needs of existing buildings in their pursuit to lower energy consumption. This program includes three distinct components (similar to the New Construction program) each aimed to address specific market barriers and to advance efficiency: Prescriptive incentives are intended to support trade allies in advancing energy efficiency sales and to provide signals to customers who are making direct purchases that will encourage them to adopt the more efficient and more cost effective option. Custom incentives provide services to investigate opportunities to increase efficiency and support the steps needed to implement the upgrades. Finally, upstream delivery provides a more efficient way for customers to receive reduced pricing at the point of sale for energy efficient equipment purchased.

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b. 2019 Goals

For the 2019 Annual Plan, Large Commercial Retrofit has the following goals:

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Electric

Demand Reduction (Annual kW)	Energy Savings (Annual MWh)	Customer Participation
12,562	71,771	2,193

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Gas

Energy Savings (Annual MMBtu)	Customer Participation
155,049	158

c. Pathways to Meet Program Requirements

i. Prescriptive Path

Prescriptive incentives are available in this program for some of the more commonly installed pieces of energy efficient equipment that are replacing standard efficiency equipment. Manual application forms have been available on the Company's website for customers and contractors to use when applying for incentives. Beginning in January 2014, prescriptive gas incentives were offered online. In the Fall of 2018, National Grid plans to roll out an electronic application for customers to apply for prescriptive electric and gas incentives. This is known as Rhode Island Digital Application Portal (RIDAP). RIDAP was based on a similar model created by the Program Administrators in Massachusetts, known as MassSave Application Portal (MAP). MAP was rolled out early in 2018. Most of the Massachusetts Program Administrators for both electric and gas energy efficiency for C&I participate in this portal for their customers and vendors.

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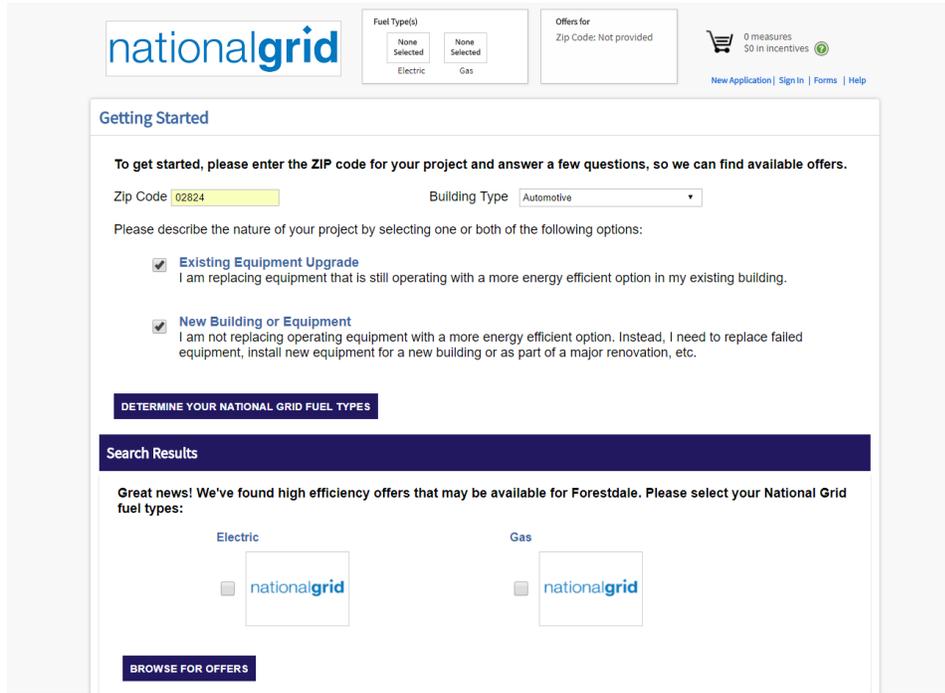
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[A couple of screen shots for this portal are displayed below.](#)



In 2019, the Company will continue to offer prescriptive gas and electric incentive options. For more details on measure descriptions refer to Attachment 2019 Technical Reference Manual.

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Custom Express Path

Similar to the New Construction Program above, the Retrofit Program also offers a custom express path for select retrofit measures. Some examples of electric custom express measures under the Retrofit Program include:

- Transformers
- Lighting
- Refrigerated Case Covers
- ECM Motors

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Examples of custom express natural gas saving measures under the Retrofit Program include:

- EMS controls
- Energy Recovery Ventilator (ERVs)
- Heat Recovery Ventilators (HRVs)
- Steam Traps
- Pipe, Valve, and Tank Insulation
- Rooftop Units (RTU) Optimization

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ii. Custom Path

A customized approach that assesses the operations of the building through a technical assessment report (TA study) is usually the first step a customer experiences before applying for a custom incentive. Similar to the New Construction Program, the energy efficiency technical assessment studies for the Retrofit Program can also be used by customers to provide engineering support for the [Advanced Gas Technologies \(AGT\)](#) Program.

These Large Commercial Retrofit Program incentives are designed to move customers to adopt more energy efficient operations and measures. Incentives cover up to 50% of the total project cost including labor and equipment. The ability to negotiate custom incentive levels and TA costs for some of the largest customers will also be available for this program. See more details on this in the Large New Construction section above.

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In 2019, the Company will continue to offer custom gas and electric incentives. Refer to the appendix at the end of this attachment for a sample of custom measures and new technologies. In addition, the following technologies will be tested through building projects: In 2019, the Company will [continue to](#) focus on a system optimization approach by setting more aggressive, minimum thresholds for efficiency.

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National Grid helps Calise & Sons Bakery with a major equipment upgrade.

“This project is a pillar that supports the ‘Calise Way,’ which is our mission to produce high-quality breads and rolls in a safe and clean environment.”
– Peter Petrocelli, Chief Financial Officer, Calise & Sons Bakery



PROJECT FAST FACTS:

Final cost of Installed ECMs	\$383,052
Authorized Incentive	\$103,442
Customer Cost	\$279,629
Annual kWh Reduction	543,071 kWh
Annual Carbon Reduction	200 metric tons CO ² @ 810 pounds per MWh
Annual Savings	\$70,600 @ \$0.13/kWh
Return on Investment (ROI)	25%

d. Commercial Retrofit Program: Gas Technologies

The following technologies are being deployed or are currently being explored for the commercial retrofit program for various market sectors.

i. Heat Exchanger Cleaning

During 2016, a demonstration project on heat exchanger cleaning was completed in Boston. It was also tested in Rhode Island but costs for this measure were high and it did not screen well.

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Deleted: In 2017, there is a plan to roll this out to Rhode Island customers, as the expectation is that this will be a good measure in terms of natural gas savings. This demonstration project is for shell and tube steam to hot water converters that are used for heating and hot water in hospitals, hotels and industry. The first demonstration project predicts 19,000 therms in annual savings for 10 similarly sized heat exchangers. Savings will vary based on the number of heat exchangers cleaned, size of system and hot water loads.¶

Results of the first demonstration project were excellent. Savings estimates were exceeded and project results passed the screening. The Company is currently performing a second demonstration project at a large university on 19 shell and tube steam to hot water heat exchangers. The Measurement & Verification Plan includes an in-line vortex style steam meter and water flow meter. The baseline metering is getting underway at the time of this writing. A third demonstration project at a large university in Providence, RI is starting to provide upgrades and cleaning of steam to hot water heat exchangers for improved efficiency of steam systems.¶

ii. Xeros Polymer Laundry Solutions

There is a new technology on the market for commercial laundry operations which uses 80% less water, 50% less energy (natural gas) and 50% less detergent than more traditional equipment. The market sector for this equipment crosses over the Company's traditional market sectors – it includes commercial laundry facilities, laundromats, universities, and hotels. In addition to the obvious energy saving benefits, there are other benefits associated with this technology including requiring a lower temperature to operate, ability to get out stains other cleaning cannot do, ability to complete a cycle in less time, and ability to clean some materials that were previously unable to be cleaned. In 2019, National Grid plans to target the on-premise laundry customer segment as part of the Company's lodging and hospitality initiative as well as, commercial laundries and laundromats.

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iii. On-Premise Laundry (OPL)

There are some on-premise laundry solutions to reduce natural gas energy usage including ozone, condensing equipment and a retrofit for dryers. National Grid has experience offering incentives to customers installing this equipment. In 2018, webinars will be provided to further encourage customers to embrace these technologies. The Company has successfully incentivized new commercial washers and dryers in hotels in Massachusetts and would like to gain more traction in Rhode Island. There is an Energy Star rating for commercial OPL Washers but none for dryers; however the custom path can be used to calculate savings. This typically screens as an end of useful life measure by comparing the incremental cost of the energy efficient machine to the machine being replaced.

Deleted: In 2018, the Company will focus marketing and sales efforts on these types of businesses to make them aware that there are retrofit and end of useful life incentives available on commercial laundry equipment

iv. Dry Smart

Dry Smart RMC™ (Residual Moisture Control) Due to the high costs associated with replacing commercial dryers, many times the units are repaired rather than replaced. This technology allows installation and monitoring of a moisture sensor retrofit at lower costs than replacement with a new energy efficient commercial dryer. The moisture sensor senses the level of dryness and stops the machine when a load is dry. This reduces gas that would otherwise be wasted. It has received good test results.

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v. Steam Trap Smart Tags

In conjunction with doing a steam trap survey, smart tags can be added to each steam trap being reviewed. The steam trap vendor hangs the tag on each trap and provides National Grid and the customer with a spreadsheet providing information on the status of each steam trap including date of service. There will be a National Grid logo and an app that a new facilities manager can use to quickly get up-to-speed in learning about the condition of steam traps in their new building. Infrared images are also available. This will also provide the new facilities manager with instantaneous information about National Grid's energy efficiency programs. No incentive is available at this time but may be considered in the future. These tags have been provided to National Grid's steam trap vendors to use on work done in the Company's energy efficiency programs. By the end of 2018, more data will be available. Once the data is entered into the system, it will take a couple of years before the savings can be measured. At that time, the bar codes will be scanned and the condition of the steam traps will be noted and savings from repairs can be determined.

Deleted: As of this writing, Phase 1 of the implementation is ongoing. The steam trap smart tags are being placed on existing and newly replaced or repaired traps on surveys performed in 2017.

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vi. Greenheck Grease Filters

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This is an emerging technology that incorporates an air to water heat exchanger into grease filters which fit into commercial kitchen exhaust hoods. In addition to exceeding UL grease collection requirements by 3.5 times, they also serve to pre-heat hot water. This also saves natural gas and electricity and the system captures and reuses waste heat that would otherwise be wasted to the outside. In 2016, EcoThermal, a manufacturer, partnered with the Company's vendors to perform demonstration projects in Rhode Island, Massachusetts and New York. As a result of this demo project, customers can expect energy savings and reduced cleaning costs to exceed \$4,000 per year. The average restaurant can save 2,000-3,500 therms per year in gas as a result of the pre-heating of hot water. This results in an average CO₂ reduction of 18.6 metric tons per site. That manufacturer has since gone out of business but the same technology is available with Greenheck. This is an HVAC manufacturer. Additional testing is being conducted in RI and MA. This will be a custom measure available for restaurants and colleges in 2019.

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EcoThermal Filter's™ website mentions that National Grid incentives are available for Rhode Island commercial customers. Filters fit into standard commercial kitchen hoods, making installation easy. Regular maintenance can be done by the restaurant's team

and a deeper cleaning requires filters to be disconnected. Some restaurants hire a hood cleaning company for this work.

Sales efforts of this product have stalled due to the manufacturer pulling sales back to its headquarters in Michigan. This measure can succeed again if a local installer and sales force can be found in Rhode Island. The Company is inquiring with the manufacturer about their plans. National Grid is developing a relationship with new players to this market in New England and will provide trainings and presentations to the RI Hospitality Association Members to highlight this measure as well as other viable gas measures.

vii. Removable Insulated Jackets for Big Steam Plants

For some of National Grid's largest customers, steam turbine insulation jackets improve both efficiency as well as safety in the plant. They are easily removed and replaced by any staff member. Both standard and custom sized jackets are available. One single turbine can save \$9,500 in energy in a year. A heat loss reduction of 135 BTUs per square foot per hour can result from using the jackets. Touch temperature can be reduced from 750⁰ F to 145⁰ F, improving safety. This product also has a five year guarantee. This is a custom express gas measure that can save customers tens of thousands of therms annually. The measure will be aggressively implemented by the Company's energy efficiency sales teams in RI to all medium to large C&I customers who use steam and high temperature hot water for processes and space heating. It can also be used on all valves, fittings, steam traps, condensate tanks and uninsulated hot water tanks. The jacket has excellent synergies with general mechanical insulation on piping systems, steam system assessments and steam trap surveys. National Grid is providing training for these measures with targeted webinars on gas measures and Steam System Assessments.

e. New Gas Measures Being Developed

i. Heat Watch

The Company is also facilitating "Heat Watch" for Multifamily, small business and C&I programs. This service includes running boilers in conjunction with controlling and managing the whole boiler and heating systems for a facility. National Grid is currently working on a custom savings tool and new measure development approval processes.

Deleted: <#>Tub Spout Water Saving Trickle Device ¶

Similar to the ShowerStart device. ShowerStart allows you to save hot water and energy that's used while waiting for a shower to become warm. It is being explored in 2018. This device will be approved for small business, multifamily and C&I programs

This service will save 5-8% of energy on steam systems by preventing overheating and improving temperature control of spaces, especially during spring and fall. Test results will not be available until Q1 2019 due to seasonal heat usage.

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ii. Cozy™ Radiator Covers

The Cozy™ Radiator covers are insulated enclosures with a room temperature sensor controlling a fan that introduces heat to the space when needed. It virtually makes each steam radiator its own controllable HVAC zone. One NY university was able to reduce boiler run times by 41%.* Non energy benefits include increased asset value, improved tenant/occupant comfort, reduced emissions, and improved safety. One college in RI has had good results. This measure is available as a custom project.

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iii. Aeroseal

Aeroseal is for both heating and cooling. It provides duct sealing to seal up old leaks by blowing in atomized polymers. Before and after testing is being conducted.

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a. Initiatives specific to Retrofit Program

Specific initiatives are listed below within the retrofit portfolio that address specific and unique needs of the existing buildings upgrades:

i. Retro-Commissioning

Retro-Commissioning (RCx) is defined as “the process of applying rigorous testing, verification and upgrade protocol to an existing building control system to identify and correct operational inefficiencies”⁴. RCx can be coupled with a monitoring system which uses metering and software to provide ongoing energy performance feedback directly to building operators and or the Company.

RCx targets both electric and gas saving measures and helps commercial and industrial customers improve performance and reduce energy consumption of their facilities through the systematic evaluation of existing building systems and may include continuous commissioning. RCx recommendations from a study are usually no-cost and

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

⁴ *Retro-commissioning Best Practice Study*, Revised Draft for C&IMC Review, MA, May 22, 2014

low-cost HVAC measures that can be implemented in the course of normal maintenance or enhancements to building automation systems, eliminating energy waste. In addition to energy benefits, RCx results in increased comfort for occupants, and provides building information to owners and operators that allow the building operators to meet occupant needs for specialized systems, safety, security, and improved long-term capital improvement plans.

National Grid launched a retro-commissioning initiative with four customers from the healthcare, hotel and education sectors in 2017 which continued into 2018. Certain screening criteria were used for the selection of customers. Criteria included whether or not customers had an EMS; whether or not they had controls; and if they frequently received complaints from occupants about being too hot or too cold. The intent was to look for customers that had the greatest need for this service and for National Grid to be able to learn from the experience. The selection criteria used, proved to be successful, as four out of the five candidates selected continued to proceed with the initiative. From the launch of this initiative the Company has learned about engagement and that sustained savings from retro-commissioning takes patience, sustained interest, and commitment from both customers and by implementers.

As a result of the Company's experience with retro-commissioning to date, the Company will work with the Massachusetts team and is considering a tiered approach for 2019. The first tier would be the most simple – take about five common measures and scope out inputs and outputs. This can be a Custom Express approach. The next tier, Phase 2 would be deeper and broader. The third tier would involve the more traditional full retro-commissioning.

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The Company plans to work with controls/system manufacturers in an attempt to provide a more seamless experience for the facility managers who will be operating the systems once the manufacturer's installation is completed and they leave the facility.

Deleted: look to expand this initiative in 2018 and stream line the existing process for customers such that they benefit from this service in a manner that is both timely and less costly. In 2018, the Company will also investigate and determine ways to develop the vendor services market and test various TA vendors as well as turnkey RCx service providers in the Rhode Island market.

ii. Boiler Tune-Up Initiative

In 2015 a natural gas boiler tune-up demonstration project began in Rhode Island. In 2016, this project became an initiative and modifications were made to the qualifying criteria which broadened the reach to more customers. In 2016-2017 a strategy to engage with boiler service provider companies was deployed to pilot this program but was not successful. Many of the boiler tune-up service providers have existing contracts

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with customers and were not willing to modify their contracts to accommodate this initiative. In 2019, a new go-to market strategy will be tested where the Company will identify customers with gas boilers that meet the initiative criteria and the National Grid sales team will approach customers to enroll in this boiler tune-up initiative.

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iii. Strategic Energy Management Planning (SEMP)

The Strategic Energy Management Planning (SEMP) Initiative is available to National Grid's largest C&I customers who have the potential to go deeper with energy efficiency, have a level of in-house sophistication to make organizational changes to plan for multi-year energy planning, and are motivated by corporate and institutional sustainability goals. A Memorandum of Understanding (MOU) offers a way to document a commitment between the customer and the Company to work together to achieve mutually stated goals through specific actions that are tailored to the customer's facilities over a multi-year planning horizon. As such, an MOU (though non-binding in this case) can set the stage for achieving deeper and more comprehensive energy efficiency savings, and is more likely to succeed than a "one measure" or "one year" approach. Typically, MOUs include participation and a commitment by upper management, the establishment of specific, very aggressive energy efficiency saving targets, and measurement and verification strategies to document savings throughout the target facilities along with an incentive structure that meets the customer's financial criteria. This offering goes far beyond energy efficiency into sustainability and branding support for the customer.

The Company currently has four SEMP MOUs. Two are large university campuses, a third is with a hospital group comprising of RI's five largest hospitals. In the second quarter of 2016 the Company added an additional SEMP focused on State facilities (detailed above under Municipal and State Sector). The Company will continue to work with these customers to help achieve their MOU goals. In 2019 the Company will ramp up efforts to engage more customers with SEMP initiatives. The potential customers include colleges and universities in Rhode Island not yet engaged with SEMPs, cities, K-12 schools, industrial customers and with chain restaurants.

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Brown University — MacMillan Hall

New capital projects at Brown participate in National Grid's Comprehensive Design Approach Demand Side Management program. Brown has been an early adopter of advanced technologies such as daylight dimming control and demand-controlled ventilation.

The Need —

Replacement of air-based cooling systems that were reaching the end of their useful life cycle.

The Solution —

Upgrading an existing, more efficient chilled water-based system on an adjacent building and expanding into MacMillan Hall.

The Result —

- Saving on annual energy costs.
- Reducing impact on the environment.
- Improving the efficiency of their facility.

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How National Grid and Lifespan Made This Happen Together

Of all the projects recommended, Lifespan went forward with 60% of the projects initially. **National Grid was able to provide Lifespan with generous financial incentives through its Strategic Energy Management Plan (SEMP) initiative** which helped offset a significant portion of the equipment and installation costs. The combination of these incentives and an attractive on-bill financing option helped Lifespan secure the necessary capital to invest deeply in energy efficiency and patient care, while also reaching an attractive return on investment for the hospitals.

Lifespan achieved 8 to 10 percent in savings. This equates to roughly \$1.4 million annually.

When asked if companies should consider National Grid for their future projects, a representative from Lifespan said, "I would highly recommend this thoughtful approach for energy planning and environmental stewardship. The energy savings are great, and all disciplines worked together to achieve scale."

After the success of their last project, Lifespan is working with National Grid again to enable implementation of the remaining projects. The collaborative partnership between Lifespan, National Grid, and B2Q Engineering made this a **rewarding endeavor, benefiting Lifespan's patients, visitors, employees and finances.**

With a team of technical experts, financial incentives to drive down capital costs, and resources to help you every step of the way, there's no better way to achieve the scale required to improve energy efficiency.

In 2019, the Company will continue to develop the SEMP initiative to include three tiers of offerings to customers, including financial tiers and service offering tiers, such that customers receive products and services customized to meet their needs. The goal of these tiered offerings is to engage in more SEMP's in the coming years that are tailored to fit customers' needs. Tier 1 will be basic services that establish a governance structure and help the customer coordinate gross annual energy savings. Tier 2 will include the basic service available in Tier 1 plus Technical Assistance (TA) services, Tier 3 will include Tier 2 services plus provide project management services to the customer.

National Grid is also engaging with SEMP customers with Non-EE Solutions within its SEMP initiative, such as renewables, storage, electric vehicles, and distributed energy resources and technologies.

iv. Lighting Designer Incentives (LDI)

Most lighting projects involve replacing old lighting fixtures with new, energy efficiency fixtures. This yields savings but leaves more savings untouched due to the lack of redesign. The LDI incentive goes directly to the lighting design team to fund their design and modeling efforts to achieve lighting energy savings while maintaining quality lighting design. The goal of this incentive is to have an early and deep impact on lighting projects, ensuring that energy efficiency and lighting quality is considered from the beginning and supported until the end of a project. The lighting designer becomes an EE champion, fighting for the best EE lighting for incentives. These lighting design solutions will have greater persistence because they are designed by professionals who have balanced the human needs of the project with the performance requirements of the lighting system, creating quality lighting designs that are "right-sized" for the project to meet the lighting end use needs in an energy efficient manner. In 2018, the Company plans to streamline the Lighting Designer Incentive program requirements and will expand the qualifications of a lighting designer to include architects and engineers who have 5 years of demonstrated lighting design projects.

Upstream Path: This is described in more details in section 5.f.ix. below.

v. Solid State Street Lighting

Based on the feedback it received from Rhode Island cities and towns, the Company estimates total savings to be approximately 35,000-37,000 annual MWh for solid state street lighting in Rhode Island. As of this filing, 16 towns in Rhode Island and three fire districts have completed the purchase of street lights, representing approximately 47%

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of the municipalities served by National Grid. In addition, four fire districts and the town of Foster are in the completion stages for purchasing their own street lights. Five of these towns have completed installation of LEDs, either with or without controls. Eleven additional towns have received closing documents and could submit them at any time to complete the sales. Two others are in the process of purchasing their street lights from National Grid.

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Customer Owned Street Light Equipment

Prior to rolling out the customer-owned street lighting tariff in 2014 and the energy efficiency program to customers, the Company held numerous meetings with municipalities and OER to ensure that customers understood what was involved in the process of acquiring the assets and equipment going forward. Beginning in 2016, the Company received the first requests for municipal customers in Rhode Island to purchase their own street lights from National Grid in anticipation of converting them to solid state street lighting and in some cases, attaching adjustable controls. In 2018, the Company anticipates the interest from cities and towns in converting their street lighting to LED to continue. As of this writing, there are 10 towns that have installed LED street lighting for which applications have been submitted but post inspections cannot be done until more information is received from the contractor.

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Deleted: In 2016, 6,698 annual MWhs were saved by the City of Providence, during the first phase of their street light installation. As of this writing in 2017, four communities have saved a total of 7,238 MWhs by purchasing their own street lights and converting them to LEDs.

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National Grid recommends that municipal customers purchase LED fixtures and controls that meet the criteria of the Design Lights Consortium or Energy Star to take advantage of the Company's energy efficiency incentives. Information regarding energy efficiency incentives is provided by National Grid and OER. Historically, National Grid has not provided lighting design for street lighting because this is a customer option based on safety and security needs as well as the aesthetic preference.

On May 25, 2017, the PUC approved the Company's request to revise Street and Area Lighting S-05 – Customer Owned Equipment S-05 tariff (Rate S-05) to expand eligibility to include any municipal city or town, any fire district, any municipal water utility board, Kent County Water Authority, Rhode Island Commerce Corporation, Quonset Development Corporation, Rhode Island Airport Corporation, Narragansett Bay Commission and the State of Rhode Island. This change went into effect on June 1, 2017. Rate S-05 had previously been restricted to only providing service to streetlights owned by municipalities after being purchased from National Grid, pursuant to R.I.G.L § 39-30-1. National Grid agreed to expand the availability of Rate S-05 to these other

entities. The Company's request to revise Rate S-05 was supported by the Partnership for RI Streetlight Management (PRISM), the RI League of Cities and Towns and the Washington County Regional Planning Council.

In 2018, the Company added an additional 3,080 annual operating hour equivalent option to the tariff offering for customer owned LED street lighting.

Since the beginning of 2015, the Company has offered incentives to municipal customers of \$0.15 per kWh of first-year savings for qualifying LEDs and \$0.25 per kWh of first-year savings for qualifying controls associated with either the dimming or part-night run hours as set forth in the street lighting tariff. These incentive levels will continue in 2019. Since the tariff was amended, the incentive is now available for all of the entities listed in the tariff.

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In addition to the funding provided by the systems benefit charge mentioned above, the OER continues to accept applications for street lighting grant funding from communities and will continue to evaluate the needs of communities for LED street lighting in 2019. There is a \$300,000 cap on the funding to individual cities and towns from OER. RIIB funding will continue in 2019.

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Beginning in 2016, Rhode Island communities began to benefit from the Rhode Island Infrastructure Bank's (RIIB) Efficient Buildings Fund. Interested cities and towns applied for this funding in spring 2016. This funding is expected to continue for calendar year 2019.

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Company Owned Street Light Equipment

In January 2017, provisions in the Company's tariffs for company-owned street and area lighting making available an LED option for customers went into effect. When a customer leases its street lights from National Grid and requests the exchange of an existing luminaire for an LED fixture, the energy efficiency incentive paid to that customer will be the same amount (\$0.15 per kWh of first-year savings) as is offered for qualifying LEDs in the customer-owned option. This incentive offering was presented to and agreed upon by the Collaborative in March 2016. Current company-owned street lighting tariffs bill energy consumption based on a dusk-to-dawn schedule. At this time, there is not an option for billing on other schedules such as part-night or dimming with the use of adjustable controls. Therefore, there is no energy efficiency incentive

currently available for these adjustable controls. However, as the technology evolves and if it becomes a cost effective option for its customers, the Company would then consider the inclusion of adjustable controls or operating schedules in a future tariff filing and also include an incentive in a future energy efficiency program for company owned street lights.

Similar to a multifamily building or leased commercial space where the tenant pays the electric bill, as long as the landlord (in this case, National Grid) approves the replacement, the customer leasing the street light will receive the energy efficiency incentive directly.

The table below reflects some of the similarities and differences between the two ownership options available to customers for solid state street lighting.

Distinction	Customer-Owned	Company-Owned
LED Fixture	Customer owns the equipment and is responsible for the purchase, financing, and maintenance	National Grid owns, installs, and maintains the equipment. The customer requests the exchange of existing or installation of new lighting
Energy Efficiency Incentive	Customer receives a one-time incentive payment for the installation of LED equipment (after satisfactory post-inspection by National Grid)	Customer receives a one-time incentive payment for the installation of LED equipment (after satisfactory post-inspection by National Grid.)
Purchase/Lease	Customer purchases the equipment	National Grid leases the equipment to the customer
Outreach	League of Cities and Towns,	League of Cities and

Distinction	Customer-Owned	Company-Owned
	Annual Department of Public Works (DPW) meeting with Company, and various other meetings	Towns, Annual DPW meeting with Company, and various other meetings
Technical Support	Customer is responsible	Customer is responsible

vi. Strategic Energy Management Demonstration (SEM)

Strategic energy management (SEM) is a set of processes for business energy management. The main goal of SEM is to activate industrial and manufacturing customers, through a multiplicity of interventions including individual and group coaching, to address O&M measures in the short term, pursue capital measures in the medium term and establish a culture of continuous improvement in its energy performance over a longer-term period.

Success is judged from a custom built model that takes into account the host of factors that may influence energy use within a facility. While an increase in capital measures is a frequent and desirable outcome of the SEM process, it is excluded from the ultimate savings reported by the initiative.

The energy benefits of SEM include reduced energy consumption through improved energy efficiency and energy conservation, improved demand management and the potential for reduced demand charges, decreased overall energy cost, and reduced greenhouse gas (GHG) emissions.

National Grid issued a joint RFP with the Massachusetts Program Administrators (MA PAs) in 2017 to find a company with expertise in running an SEM initiative. Six responses were received, but the field was quickly narrowed to three companies that have had the most success with SEM initiatives in the United States and Canada. Ultimately, National Grid and the MA PAs selected Cascade Energy for their proven expertise in the field, stellar recommendations, and excellent communication skills.

Cascade is scheduled to begin recruiting for this initiative in August of 2018.

vii. Peak Load Reduction Strategies

The Company plans to pursue electric and gas savings with its customers that will result in peak load reductions in addition to annual kWh/therm energy savings. In addition to

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The central concept of a SEM initiative is to identify and capture energy savings from non-capital measures and create a culture within customer organizations in which all members of the staff are ...

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Market Analysis¶

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exploring peak demand strategies with its SEMP and industrial customers where there are large pockets of savings, the Company will continue to pursue the following strategies for summer and/or winter peak reductions:

- a. Wireless temperature controls: These controls provide the benefits of large commercial HVAC equipment, especially roof-top units for small businesses. The Company will continue to create messaging around the benefits of these controls for electric and gas and how it has a direct response to the expectation of higher energy costs in winter and summer. Selectable settings and the ability to send system information directly to a computer or mobile device enables users to remotely manage multiple rooms and properties thereby improving energy efficiency and occupant comfort.
- b. Marketing campaign for best practice tips: This campaign, which has been carried out since 2015 will continue in 2019, as well. This consists of a list of best practices for reducing electric and gas usage during winter and summer months, and could be distributed to all C&I customers during the winter of 2017 and summer of 2018.
- c. Pipe Insulation and steam trap surveys are already part of the Company's measure mix that is offered to its customers. As part of the winter campaign both of these measures will be marketed through the Company's sales and marketing teams to reinforce the importance of these measures on winter usage.
- d. Boiler Tune-Up: The boiler tune up initiative described above will further assist customers with winter peak reduction.
- e. Lighting and controls: Several initiatives and measures help reduce summer peak load through lighting specific measures.
- f. Demand controlled ventilation and energy recovery on HVAC units: Both measures provided in the programs that save on peak reductions.
- g. Demand Response: The Company is pursuing a [gas demand reduction pilot project](#) to test DR capabilities (described in section below).

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viii. Products Offered Through "Upstream"

When the Company refers to an "Upstream" initiative it is referring to the practice of offering an incentive directly to a manufacturer or distributor (mainly distributors in Company initiatives) of efficient equipment instead of offering an incentive to the customer through an application form after the sales transaction has been made. This

allows them to sell the product for less and make it more appealing to a potential customer. It also allows the customer to acquire this more efficient equipment without the burden of paperwork and waiting for reimbursement.

Upstream Lighting

National Grid's first, and flagship, upstream initiative is formally known as "Bright Opportunities Rhode Island". This initiative was launched in February of 2012 with four types of LED and four types of fluorescent lamps. Today, the program includes a wide variety of LED lamps, small LED luminaires, and various sizes (1'x4', 2'x2', 2'x4') of recessed ambient LED luminaires or "troffers." To date, it has achieved tens of thousands of net annual MWh in savings and will continue to play a major role in the Company's programs in 2019 and into the future due to the fact that:

- Moving products from Downstream to Upstream removes customer-facing paperwork that the Company's customers have routinely indicated is a barrier to participation.
- Moving products from Downstream to Upstream has shown major increases in volume and energy savings in the past. This volume and increased competition between many manufacturers and distributors drives the prices of luminaires down quickly and has given the Company opportunities to reduce incentives and make the initiative an even more cost efficient way to deliver lighting savings.
- Moving products from Downstream to Upstream, especially in concert with Mass Save Program Administrators (PAs), tends to change the stocking pattern of distributors across the region which facilitates the transition from fluorescent or HID sources to more efficient and more easily controlled LEDs.

Although the Company is constantly striving to deliver savings "deeper" than lighting, a rapid expansion to savings in lighting will have a positive effect (decreasing kW demand) in both winter and summer peak times due to the fact that commercial lighting is generally on during these times.

In 2017, National Grid eliminated all fluorescent offerings in Upstream lighting. The entire initiative will be focused on LED lamps and luminaires.

In 2018, National Grid saw a lower volume of the type of LED lamps that were first introduced in the initiative come through the system. The Company believes that this is

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due to the fact that a substantial portion of this market has been converted to LED lamps and that it might be nearing a saturation point. Therefore, the Company will spend more time and incentive dollars focusing on how to increase the volume of 1x4, 2x2, 2x4 luminaires, especially those which offer built-in controls which will result in more savings.

National Grid will continue to offer incentives on linear LED replacements for T8 fluorescents, as there are places where this technology is appropriate. However, the Company feels that many customers would be better served by a new luminaire, especially those with built-in controls. The Company continues to investigate other high efficiency lighting equipment and controls to potentially add to the program. In 2018 the Company added LED wall packs and high bay luminaires.

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Upstream HVAC

The success of the Upstream Lighting initiative encouraged National Grid to explore other areas where the Upstream model could be used successfully. After some research, the Company decided to issue a joint RFP with the Massachusetts Program Administrators (under the "Mass Save" umbrella) for a company to run an initiative that will encourage distributors to change stocking patterns and advocate for energy efficient Upstream Unitary HVAC and Heat Pumps up to 25 tons.

As of Q3 of 2015, the Company and its partners EFI/CSG had enrolled all major manufacturers and have made inroads in understanding how this market works.

Deleted: This initiative has slowly increased savings delivered to the Programs since its inception. This initiative is less dynamic than the Upstream Lighting initiative, described above, as there are fewer manufacturers and less transparent pricing structures.

The contract with the previous vendor ended on December 31, 2016. A new vendor was selected and began January 1, 2017. There was a significant transition period for the first half of 2017 between the current and previous implementation vendors. More relevant program success data will be realized in the second half of 2017 and moving forward.

**It is important to note that savings from this particular set of products will be calculated from new construction baselines, not retrofit.*

In addition, the Company introduced two new Upstream HVAC products which are Electronically Commutated Motor (ECM) circulator pumps under 3 horsepower (HP) and Variable Refrigerant Flow (VRF) systems in Q3 of 2017. These new equipment types will be added to the existing equipment offered through the Upstream HVAC initiative through the same implementation vendor.

Optimize relationships with HVAC vendors to enhance the HVAC upstream program

In addition to the array of HVAC solutions the Company has supported for years, ranging from the air- and water-cooled air conditioning and heat pump equipment to boilers and furnaces and related controls and services, the Company will begin to augment these offerings in a variety of ways to increase savings from this important end use category.

For the upstream air conditioning and heat pump equipment offerings, the Company recently hired a vendor, who not only has the requisite back office and program administration capabilities, but also has very strong technical and commercial expertise, to improve and expand relationships with equipment distributors and lead to increased savings. Additionally, in 2018 more products will be added to the upstream HVAC portfolio of offerings including Variable Refrigerant Flow (VRF) and Electronically Commutated Motor (ECM) pumps to better serve a broader array of customers' HVAC needs.

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Upstream Gas Equipment

In Q4 2015 National Grid and the MA Program Administrators launched the first product in the new Gas Upstream Program. By partnering with local water heating distributors, the Company collaboratively promoted the sale of high-efficiency water heating equipment. The Company leveraged the commercial water heater distribution network by upselling and stocking high efficiency equipment to influence as many qualifying commercial water heater sales as possible. As of August 2017, the initiative had 37 active distributors in both MA and RI representing 130 + branches. The initiative currently incents four different types of water heating equipment: Indirect, Storage, Tankless, and Volume.

Deleted: Through the Company's Channel Sales⁶ group, there are plans to work more closely and collaboratively with supply houses and wholesalers of HVAC equipment to enable them to more effectively both upsell and cross-sell energy efficient equipment. The objective is to convert more standard efficiency equipment purchases into high efficiency purchases and to increase sales of related or add-on equipment as well. Importantly, this approach will also remove the transaction costs burdens typically confronted by customers and or their contractors by having the distributors provide the information necessary to incentivize these projects. It is expected that this approach will increase savings with customers who have decided not to participate in the past, despite awareness of the available incentives and services. This approach could also lead to savings for customers who have historically been unaware of the available offerings.¶

In 2017, the Company continued working closely with its partner Energy Solutions to increase unit throughput and distributor participation. Energy Solutions is responsible for signing up new distributors, training them on the initiative, providing return on investment sales training to sales staff, and overall promotion of the initiative out in the industry throughout the state.

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**It is important to note that savings from this particular product will be calculated from new construction baselines, not retrofit.*

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Upstream Kitchen Equipment (Electric and Gas)

In late December 2017, new gas cooking equipment measures, as well as electric cooking measures, were added to the suite of upstream point of sale food service products available at participating vendor locations throughout RI. As of June 2018, the processed natural gas therm savings are already almost double what were processed in the entire year of 2017. Electric savings are starting to come in as well in 2018.

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In late 2018 or early 2019, National Grid will be sending out a direct mail marketing campaign to food service customers in an effort to promote gas and electric food service measures and where to purchase them. National Grid also plans to research other ways to promote the program through coordination with the Rhode Island Restaurant Association, email newsletter campaign with participating equipment vendor, and other means to market the program further.

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Momentum is building regarding the stocking and availability of high efficiency kitchen equipment for both gas and electric. Current 2018 results are expected to double by year end. This level is expected to continue into 2019.

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Combined Heat and Power Initiative

A combined heat and power (CHP) facility is “equipment used to produce electric energy and forms of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes, through the sequential use of energy.”⁷ Generally speaking, due to current installation costs, CHP systems are best suited to customer sites where there are significant and coincident thermal and electrical loads for a vast majority of the hours of the year. Notably, significant thermal loads during summer nights and/or swing season (spring, fall) periods aren’t especially common outside of manufacturing facilities, though lower CHP installation costs could help to expand the potential population of sites where CHP could be cost effective and offer reasonable payback periods for customers.

Deleted: During 2017, the Company and the MA Program Administrators will be launching a Point of Sale (POS) initiative for all electric and gas kitchen equipment. It will be similar to current upstream offerings in structure for natural gas only convection ovens and fryers. The customer will receive an instant rebate at the point of sale, which, for the first year, will be equal to the current prescriptive incentive, and the equipment wholesaler will receive a small spiff for their efforts in getting the customer to upgrade to a more efficient product. This differs from the way the Company has pursued Upstream paths in the past in that it will leave the current downstream path open so that the customer has maximum flexibility. This has proven successful in other jurisdictions. A protocol has already been established to prevent savings being counted and dollars being spent in two places. National Grid expects to see a considerable lift in efficient kitchen equipment flowing through the system in Q4 of 2017 once all kitchen equipment measures are made available Upstream.¶

Since 2012, the CHP provisions of the Least Cost Procurement law in R.I.G.L. §39-1-27.7⁸ have required the Company to document the support for the installation and investment in clean and efficient CHP annually in its energy efficiency program plan by

⁷ CFR Title 18, Part 292, Sub-Part A, 292.101 – Definitions

⁸ See R.I.G.L. § 39-1-27.7(c) (6) (ii) through (iv); For the legislative history, see P.L. 2012, Ch. 363, S2792 Sub A (Enacted June 21, 2012).

including a plan for identifying and recruiting qualified CHP projects, incentive levels, contract terms and guidelines, and achievable megawatt targets.⁹

For 2019, the Company will continue to offer a Combined Heat and Power (CHP) incentive. In 2019, the Company's emphasis will be on increasing the support for qualifying efficient CHP projects through the energy efficiency programs, as intended by the legislation. Because of the high capital cost and technical requirements of installing CHP, there is a very long lead time for a successful installation. With small numbers of projects and wide ranges of possible project sizes, the Company anticipates substantial variability in MW realized in any given year. Noting this, for 2018, the Company is proposing a target of 1 MW of installed capacity that is expected to correspond to approximately 8,000 MWh of savings. For 2019, the Company will explore leads for four additional projects that may complete in future years.

In 2019, the Company will introduce a prescriptive measure for small CHP systems, e.g. fewer than 35 kW.

To qualify for a CHP energy efficiency incentive, a proposed project must meet the following conditions:

- Host customers must be in the franchise service area of the Company.
- Proposed systems must either be (i) thermal leading and sized so the recoverable heat can be used to offset other facility thermal loads and generate electricity as a by-product, or (ii) using waste energy or waste heat to generate electricity.
- Both new construction and retrofit installations are eligible; in either case, the baseline system must be carefully documented.
- The overall minimum total system efficiency of the proposed CHP units must be 55% or greater¹⁰. System efficiency is calculated as Annual Useful Energy/Annual Natural Gas Input where
 - Annual useful energy = Net Annual kWh*3,413/100,000 + utilized thermal output (therms)

⁹ See R.I.G.L. § 39-1-27.7(c) (6) (iii).

¹⁰ The RI DEM's Air Quality Regulations (http://www.dem.ri.gov/pubs/regs/regs/air/air43_12.pdf; Page 11) set a minimum system design efficiency of 55% for CHP to be eligible to apply for Emission Credits. As noted in the incentive levels section below, a higher energy efficiency incentive is available for systems with efficiencies of 60% or greater.

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- Annual natural gas input = CHP gas input in therms (HHV)
- The equipment to generate electricity may be an internal combustion engine, gas turbine engine, steam turbine, back pressure turbine, or fuel cell and the facility will capture waste heat for use in the facility.

Wasted energy systems and back pressure or extraction turbines can qualify. For these facilities to qualify the following conditions must be met; because these systems are designed to take advantage of existing on site wasted energy or inefficient processes, there is no minimum total system efficiency requirement.

- Host customers must be in the franchise service area of the Company,
- All thermal and electric output of the CHP facility should be used on site,
- While it is expected that most of these applications will be retrofit, both new construction and retrofit installations are eligible; in either case, baseline system must be carefully documented,
- The project must pass cost effectiveness screening.

The Company will undertake the following steps to support qualified CHP projects.

Identification and Recruitment of Qualified CHP Projects

The Company currently works with vendors and customers to identify CHP opportunities at customer locations. The Company promotes CHP systems and outlines the process for qualification and implementation of CHP facilities through the Company's energy efficiency programs. The Company has sales and technical staff who are the primary points of contact for customers and vendors with potential CHP projects. The Company will continue to communicate criteria for CHP assessment and will communicate to vendors so that their presentations to customers will be more consistent with Company technical assistance requirements.

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Scoping Study/Qualification

The Company will offer technical assistance on CHP projects beginning with a preliminary scoping of a potential site. This scoping will be based on an evaluation of:

- Monthly (or hourly, where available) electric, gas, and other fuel usage
- All site-specific forms of thermal energy end uses
- Coincidence of electric and thermal loads
- Proposed project cost

This scoping will determine if further study of the site appears favorable, i.e., provides CHP operating hours and load factors that would be an appropriate application of CHP.

Technical Assistance Study

Assuming a favorable screening during preliminary scoping, National Grid will offer to co-fund a TA study of CHP with the customer. The TA study will be performed by an independent, qualified engineering firm. This study will assess thermal and electric loads, propose an appropriate CHP size and technology, compile a budget cost estimate, and identify potential barriers to the technology, etc. National Grid typically funds 50% of the cost of any TA study conducted by a preferred vendor selected by the Company, and up to 50% of the TA for other qualifying independent engineering firms. Any TA study by a CHP vendor or its representative which fulfills the CHP TA requirements may be accepted, though no co-funding will be provided. The TA study must be completed, submitted, and approved by the Company prior to implementation. The TA study must include an assessment of the likely on-peak kW reduction from the CHP given the proposed nameplate rating, the net CHP output after subtracting parasitic loads associated with the CHP, projected availability based on anticipated site-specific operating characteristics, and performance data on other similar units. (On-peak kW reduction = Net Output x Availability x % Loaded.) This kW load reduction should be used in the benefit-cost screening.

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As indicated in the incentive levels section below, a larger incentive is available for CHP projects that include the implementation of energy efficiency measures at the host facility. If the customer wants to meet a higher tiered incentive and did not previously qualify for that higher tier, the company could include another audit. This audit would propose measures to fulfill that requirement with new energy efficiency opportunities. These opportunities themselves will be eligible for energy efficiency incentives and will help make sure that the CHP facility is correctly sized for the facility's needs and will avoid creating a disincentive for future load reduction at the site.

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Cost Effectiveness

The screening for cost effectiveness specific to CHP is included in the Total Resource Cost Test Description included as Attachment 4.

Incentive Levels

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If a project has been shown to be cost effective, it will be eligible for an incentive. Incentives will be determined following cost effectiveness screening in consultation with National Grid personnel. The following rules will apply to all CHP projects (regardless of size) in the determination of the incentive. However, the amount of incentive the Company is willing to offer and commit to the customer could depend upon the amount of funds that are budgeted or remaining in the budget of the energy efficiency program or unique attributes of the project.

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- For cost effective CHP projects, the target energy efficiency installation incentive (“installation incentive”) in 2019 is \$900 per net kW, where net is nameplate kW output minus CHP auxiliary kW. For CHP projects with efficiencies of 60% or greater, the target installation incentive in 2018 is \$1,000 per net kW. Wasted energy, back pressure turbines, and extraction turbines are eligible for incentives of \$900/kW.
- For cost effective CHP projects where the host customer also commits to implementing energy efficiency measures representing at least 5% of site energy use or the maximum load reduction identified by a TA Study, whichever is less.¹¹ The maximum installation incentive in 2018 is up to \$1,125 per net kW, and the CHP sizing must incorporate the load reduction. For CHP projects with efficiencies of 60% or greater and that have similar energy efficiency participation, the maximum installation incentive in 2018 is up to \$1,250 per net kW. A customer may be treated as having made this commitment to energy efficiency if they have made investments to achieve similar load reductions through energy efficiency within the previous five years.
- All CHP projects are also eligible to receive other incentives, such as the Advanced Gas Technology (AGT) incentive, subject to the incentive package cap described below.
- CHP facilities greater than 1 net MW may be offered an additional performance incentive, as further provided in the section entitled “Special Considerations for Large CHP Systems,” below.

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¹¹ If CHP facility sizing is determined by electric load (or not constrained by either electric or thermal load), the requirement will be 5% of electric usage; if the facility sizing is determined by thermal load, the requirement will be 5% of thermal energy usage. The energy efficiency measures will themselves be eligible for incentives, and are not part of the CHP incentive package cap described below.

- The CHP system costs must include: all system, auxiliary, and interconnection costs, and CHP maintenance. If the CHP system is receiving a tax credit or other financial arrangement that reduces the cost of the CHP to the customer without distributing that cost reduction as an additional cost to other electric or gas ratepayers, it may be treated as a credit against the cost of the CHP project.
- The CHP incentive package cap from the Company will be 70% of the total project cost inclusive of the installation incentive, incentives related to gas service, present value of any performance incentive, system reliability procurement incentive, and any other incentives related to the transaction. For new construction installations, the incentive cap will be 70% of the incremental cost difference between the cost of what would have been done absent the CHP project and the cost of the CHP project.
- Retainage of 20% of the energy efficiency incentive payment will be held until commissioning is completed.

Other Contract Terms and Guidelines

In order to ensure proper operation of the CHP facility and persistence of energy savings, the following terms and guidelines will be required:

- Minimum requirements document. As part of the TA study, a minimum requirements document ("MRD") will be developed. This MRD will contain engineering hardware and operational specifications that directly affect the savings estimates developed in the TA study. Compliance with the MRD will be necessary to receive rebate payments.
- All systems will require electric, thermal and gas metering for commissioning and monitoring of system efficiencies. Metering hardware and data collection services may be provided at little or no cost to the customer.
- The project must be commissioned. Commissioning is a process following installation whereby a third party verifies that the project is installed and operating as detailed in the TA study and MRD.
- The customer must sign and produce a contract for O&M services through the first planned major overhaul of the CHP unit after post installation commissioning. On-going O&M contracts for a minimum of ten (10) years from project commissioning are recommended.
- The customer must apply for interconnection service as soon as practical and not operate the unit until they receive the authorization to interconnect

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from the Company. While there may be site-specific interconnection considerations for particular projects, please see the attached link for information on interconnection:
http://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.aspx
http://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.aspx
http://www.nationalgridus.com/narragansett/business/energyeff/4_interconnect.aspx

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- As noted in section 5.a.i. of the EE Program Plan, kW-demand savings achieved via the electric energy efficiency programs, including CHP, will continue to be reported by the Company to ISO-NE as Other Demand Resources (“ODR”) and the revenue generated will be used to fund future energy efficiency projects through the Company’s programs.

Delivery Service Tariffs Applicable to CHP Installations

Customers receiving an incentive payment for installation of CHP will be billed for delivery service charges on the appropriate general service tariff. The Company’s general service tariffs, Rates G-02, G-32 and G-62, include a CHP Minimum Demand Provision for those CHP installations that receive an energy efficiency incentive pursuant to this Plan. For Customers subject to this CHP Minimum Demand Provision, the monthly Demand will be the greater of a) the Demand as normally defined under the tariff provisions; or b) the Minimum Demand, which shall be 50% of the greatest fifteen-minute reading from the Customer’s generation meter(s) as measured in kilowatts during the month. The Customer Charge, Transmission Demand Charge, all per kWh charges and any other applicable charges and credits will be in addition to the Minimum Demand Charge. This rate treatment is designed to mitigate the cross-subsidies from other customers in the same rate class. The Company believes it is very important to ensure that a customer who is receiving incentives through the energy efficiency program continues to pay a fair share of the costs of the distribution system upon which the customer will continue to rely when the CHP unit is off-line.

Special Considerations for Large CHP Projects

A project that is greater than 1 MW of net nameplate capacity shall be defined as a “Large CHP Project” and may be eligible for special considerations that support the development of CHP, while accounting for its unique characteristics.

Qualification

The cost of the project will be reviewed by a design/build or general contractor experienced with CHP projects and revised as necessary.

Incentive and additional terms and conditions

If a Large CHP Project passes the benefit cost test described in Attachment 4, the appropriate incentive will be determined, based on the guidelines for all CHP projects set forth in the section entitled "Incentive Levels," above.

An additional performance-based energy efficiency incentive, capped at \$20/kW-year (\$1.66/kW-month) for a period of up to ten years, will be offered as part of the incentive package for any project greater than 1 net MW. No payments will be made until the unit is in operation and provides demonstrated load reduction, and will be made semi-annually based on actual metered load reduction. Load reduction performance will be based on the net daily metered kW output of the system during ISO-New England's on-peak periods averaged over each six month period.

Performance incentives will be subject to budget limitations and, in all cases, will be subject to the 70% total project cost cap applicable to all CHP projects set forth in the section entitled "Incentive Levels," above. The total incentive package will include any incentives related to gas service, and the present value of the above-described performance incentive.

The customer will have to repay a portion of the incentive to the Company if the project is abandoned, removed from the premises, sold, or otherwise no longer utilized as the primary source of heat and electricity by the customer, within 10 years from the date of final incentive payment authorization. The repayment will be the energy efficiency installation incentive times the number of years remaining until the required ten years of service divided by ten. Other incentives, such as any Advanced Gas Technologies (AGT) incentives, may also have similar reclaim provisions.

Options for CHP proposal that fails cost effectiveness testing

If a CHP project does not pass the benefit-cost test, the Company will work with the customer to develop other solutions that may still support the CHP facility. Such other solutions may include one or all of the following:

- Re-analyzing the optimal size of the CHP unit, or the number of generators. A different sized CHP unit might provide better efficiencies and pass the benefit cost test.

- Identifying other load reduction opportunities at the facility. Benefits can be garnered from load reduction in lieu of achieving that load reduction through CHP.

Targeted Outreach and Support for Potential CHP Customers

The Company believes that significant savings can be generated with this technology in the coming years. The Company is focused on developing a pipeline of projects for small, medium and large customers. In addition to having a specific sales point person for CHP projects, the Company has a CHP program manager who helps customers navigate the technical and procedural aspects of bringing a CHP unit online. The Company also works with a TA vendor that provides assistance in identifying and executing CHP projects. In addition, the Company works with CHP vendors to offer RI customers smaller CHP units where installation and operations are turn-key. Furthermore, in 2016, the Company introduced a CHP manual to assist customers who are deciding if CHP is an option for their facilities. Other strategies that will enhance CHP acceptance will also be considered, such as: preparing and distributing case studies, providing plant operator training, and providing easier customer access to CHP unit performance data. [Link to the manual: http://ngrid.com/ri-chp](http://ngrid.com/ri-chp)

Installation of Incremental or Additional Energy Efficiency Measures for Customers who have Previously Installed CHP

The Company will individually review the installation of proposed incremental energy efficiency measures for customers who have previously installed CHP on site or who are adding additional energy efficiency equipment that might affect the performance of an existing CHP unit. The Company will carefully categorize and protect the benefits attributed to previously installed CHP projects, while at the same time foster any additional cost-effective EE measures that further reduce total energy use.

There are two types of project categories. The first category is “CHP Optimization” and involves measures which are installed with the purpose of increasing the output or operating efficiency of the existing CHP or other distributed generation (DG) unit; for example: the addition of combustion air precooling on a gas turbine CHP unit. In order to maintain compliance with ISO-NE’s FCM rules, such projects will be tracked in the

FCM, if applicable, as incremental output of the associated DG facilities.¹² The second category is “Incremental EE”, which includes “traditional” EE measures installed with the intent of reducing energy consumption in sites that have previously installed CHP. These measures may or may not affect CHP performance and output.

For locations where an existing CHP unit covers a large percentage of the total load at the facility, additional energy efficiency savings measures installed may result in lowering the output of the CHP system instead of a load reduction on the Company’s electric grid. Therefore, to assess savings that can be claimed by the energy efficiency programs, hourly load mapping may be required to accurately assess the net savings on the Company’s electric and gas distribution systems, which will be assessed at the Company’s electric and/or gas revenue meters at the customer’s site. In cases where a typically electric measure (like lighting) reduces the electric load enough to require reducing the CHP output, gas savings may result from a normally electrical energy efficiency measure and could be claimed in the Gas utility DSM programs.

b. Retrofit Program Demonstration, Initiatives and Assessment Projects

i. Industrial Initiatives and demonstrations

Behavior change through education of small/medium plant personnel initiative

Objective: The main objective is to give smaller plants cost effective access to independent air systems specialists in order to facilitate comprehensive compressed air systems assessment. The Company will develop technology and training materials needed to facilitate this objective through web based training materials and tools combined with remote data collection process and support to interested customers. The intent of this effort is to drive customers to the Company’s current compressed air offerings. Training is one component and the other is to install metering for flow, power and pressure and implement any efficiency improvements by working with the customer.

Benefits: Comprehensive systems assessments by independent compressed air system specialists are not easily affordable for small to medium size plants where total annual compressed energy cost is \$150,000 or less. This initiative will aim to educate plant personnel on the knowledge and tools required to conduct self-assessments, provide

¹² ISO-NE’s FCM rules require that new CHP facilities, or energy efficiency measures that result in the increased output of an existing CHP facility, are tracked in the FCM as distributed generation resources.

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In 2017, the Company launched a demand response (DR) demonstration for residential, large commercial and industrial customers. The goal of the DR demonstration program is to reduce peak demand costs for all customers in the regions as well as reduce installed capacity tag¹³ for individual commercial and industrial customers through peak shaving and load shifting opportunities. ¶ National Grid does not currently have specific distribution constraints on its system in Rhode Island that it is looking to address with this DR demonstration project. In early 2017, the Company enrolled over 5 MW of demand reduction for a summer demand response demonstration program with large C&I customers. The program offers customers monthly incentives for enrolled kW reduction as well as a performance incentive for DR event participation. National Grid will analyze data collected from the 2017 demonstration to assess the market potential, test delivery strategies, identify market barriers, and develop the cost effective screening framework for demand response (DR) programs. ¶ DR Events are triggered based on the day-ahead system load forecast for National Grid’s RI territory. The targeted number of event hours is 20, with each event having a 4-hour maximum duration. Events are on weekdays, excluding ...

Deleted: Energy Efficiency upgrades in pumping systems for water/wastewater plants¶

This demonstration project will be an extension of a similar project currently in progress in MA. The objective is to evaluate energy efficiency and non- ...

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training and access to needed instrumentation and facilitate remote data collection and support to identify and implement energy efficiency measures. Completion of both phases of this initiative is expected to result in the development of a proven process to assist small and medium size plants with energy efficiency improvements related to compressed air systems.

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This initiative was started in 2018 and will continue in 2019.

Implement Underutilized EE Technologies on Mechanical Power Transmission Systems Demonstration

Objective: To investigate adoption of higher efficiency belt and gear reduction drives associated with various types of machinery used in commercial and industrial facilities, such as belt drives on fans, pumps, production machinery, and other mechanical equipment. Another area of opportunity is replacement of low cost worm gear drives commonly incorporated as part of OEM equipment such as conveyors, material handling equipment, and as sub systems of major machinery. OEM equipment suppliers typically incorporate low cost lower mechanical efficiency components and systems into their products. This pilot will attempt to promote cost effective retrofit of higher efficiency components and systems into these products or assemblies. Hopefully over the medium to longer term, this initiative could lead to an upstream incentive program targeting OEM markets.

Benefits: Upgrading conventional v-belt drives to notched or synchronous belt drives with efficiency can result in efficiency improvement ranging from 1-3%. The incremental cost associated with this upgrade is more than offset by energy savings over the life of the equipment.

This initiative was started in 2018 and will continue in 2019.

ii. Lighting Initiatives

Secure Lighting Spec (SLS) is based upon a mutual agreement with Lighting Manufacturer Representatives (LMR) to engineer and deliver lighting & controls packages that exceed energy code or Industry Standard Practice (ISP), which ever is higher, by 25% or more. The goals of the Secure Lighting Spec are:

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- a. Establish a special partnership between National Grid and Lighting Manufactures Representatives (LMR) to participate in targeted code-based lighting incentive programs.

- b. Utilize the LMR application engineers to implement best practice lighting design and photometric modeling for deep energy savings and qualitative lighting outcomes for the Company's customers and building occupants, while meeting IES standards.
- c. Achieve substantial energy savings by utilizing the lighting engineering capabilities of the LMR. Savings are based on projects achieving 25% or greater energy savings beyond what is required by the energy code.
- d. Incorporate energy efficiency incentive estimates early in project quotes to clients & customers through the LMR pre-approved product portfolio.
- e. Reduce the lighting system initial costs through advanced lighting engineering, energy efficiency incentives and operating costs for customers and clients for projects that meet energy efficiency goals.

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Lighting as a Service: Lighting as a Service (LaaS) is a new business model that delivers the best lighting equipment and ongoing commissioning for system optimization through a subscription based service. The goals of LaaS are: To create a leased equipment business model with zero capital expense that eliminates initial cost barriers for energy efficiency lighting projects. LaaS contracts will allow customers to reap all of the benefits of LED technology, without getting bogged down in the detail of owning and operating the lighting asset. Since LaaS offers a full turn-key solution, this type of service partner can supply the design, financing, installation, maintenance, monitoring and responsive performance adjustments (such as color tuning and dimming.) National Grid will look to partner with a LaaS provider for these services to customers.

Benefits of LaaS are:

- a. Enables real-time energy monitoring for evaluation to confirm savings.
- b. Works with demand response by identifying lighting that can be reduced during DR events.
- c. Works best with sophisticated lighting technology that can be optimized and maintained through the service contract. It works with all code-based lighting incentive programs, and is compatible with PoE systems with a higher density of sensors and data.
- d. Is an integrated program approach, i.e., a program that offers energy audits and energy efficiency solutions for a specific building type with prearranged financing and retrofit lighting system options.
- e. Involves a detailed analysis of facilities including controls sequence of operations, building set-points, occupancy schedules and operation and

maintenance protocols. Once the analysis is complete, recommended optimization measures and an ongoing plan for maintenance and operator training is implemented. This will increase energy savings persistence and customer satisfaction.

One-Fit – Lighting Manufacturer Based Turn-Key lighting design

The One-Fit lighting initiative would utilize lighting manufacturers to design all of the lighting for a project based on lighting modeling/calculations and include controls. A lighting manufacturer's application engineers will design the lighting for existing spaces and work with a distributor who will fill in any missing fixtures with other lighting products. Projects must include fixtures, retrofit kits and controls. This is a turn-key solution for the customer and installer. Qualified projects may also be eligible for OBR. The program will be based on Performance Lighting PLUS, thereby encouraging comprehensive lighting solutions with controls. Projects must be designed to meet the following criteria:

- a. Lighting to exceed code by at least 25%.
- b. Design must include controls that meet or exceed code
- c. Must meet IES recommendations for light level, distribution, spectrum, glare control, etc.
- d. LED lighting must be DLC QPL listed products, and lighting controls or equal
- e. Use the Performance Lighting PLUS incentive program
- f. Lighting system commissioning is required after 6 months to ensure optimal system operation

The One-Fit initiative would cover a range of project types with a cap on hours of operation at 2,500 hours (for schools). Manufacturers will be partnered with energy contractors (PEXs) for purchase and installation. This is a perfect fit for schools and municipal projects.

The above stated lighting initiatives are currently in research phase and will be launched in the fall of 2018 and will continue in 2019.

Web-Based Performance Lighting PLUS App

The pilot will include an online portal for National Grid's commercial clients as well as an incentive portal for National Grid's C&I Lighting program management staff targeting

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the Performance Lighting PLUS program for retrofit and new construction. The goal of this pilot is to increase participation in Performance Lighting PLUS by creating an easy web app for project processing.

Client Portal

Client Portal will provide the following functions:

- a. Clients self-register where their utility account information is validated
- b. Enter building information based on pre-defined data requirements from the lighting program.
- c. Create project investment proposals that are validated with the product information in the DesignLights Consortium (DLC) Qualified Product List and allow users to add custom measures
- d. Calculate incentives automatically based on incentive rules and submitted applications
- e. Manage projects and facilitate communication with National Grid C&I program management staff

Incentive Portal

Incentive Portal will provide the following functions:

- a. Track and Manage incentive programs
- b. Oversee and report on pipeline projects (energy savings potential and proposed upgrades)
- c. Define incentive rules and data collection requirements
- d. Automate the validation of incentive applications
- e. Introduce real-time energy savings and incentive expenditure monitoring

iii. Emerging Lighting Technologies Assessments

Automated Window Shade Systems Assessment

Hypothesis: Will automated window shades provide increased electric energy savings in buildings with advanced lighting controls implementing daylight harvesting? Will automated window shades increase the thermal performance of the building envelope and provide gas savings in Therms?

For this pilot the Company is working with Ver-Tex a Boston based shade manufacturer representative, and SMMA to manage projects and establish the pilot parameters.

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Lighting Re-Specification Incentive ¶
Program Type: Retrofit & New Construction (Municipal Projects with Long Timelines)¶
Pilot Scope: Analysis, Research, Installation, Measurement & Verification¶
A pilot to allow long-term municipal projects that have already been specified, packaged and budgeted to change its specification to embrace current energy saving lighting technologies. Older specifications are often locked in on long-term projects based on the funding. At the same time LED lighting technology is advancing at a rapid rate increasing system efficacies, and lighting controls are now embedded into many LED fixtures. This pilot would provide incentives for the design team to perform a redo and pick newer lighting technologies that would achieve even greater energy savings than the previously specified lighting system. The pilot would use incentives to cover the additional costs of a new lighting system (including controls) so that it matches the cost of the previously specified lighting system with greater energy savings. The anticipated costs of this program will not exceed \$0.25 per project kWh. ¶

Based on existing research, typical daylighting controls save 23% of the electric energy. With automated shades that total could increase to about 43%, almost doubling the savings. Additional savings can be obtained through using thermal insulating materials that can contain heat within a building while blocking the cold. The result is approximately 5 kWh of energy savings per sq.ft. ▼

[Automated Window Shade System assessment was started in 2018 and will continue in 2019.](#)

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5. Small Business Direct Install Program

a. Overview

The Small Business Direct Install Program (SMB/DI Program) provides turn-key services to commercial and industrial customers who consume less than 1,000,000 kWh per year. Previously the qualification level was set at an average monthly demand of less than 200kW. This was changed for two reasons:

1. This new qualification number will allow businesses and electricians/vendors to more easily tell who is eligible for the small business program.
2. The program will be able to serve slightly more customers than under the old qualification rules.

All customers over who consume more than 1,000,000 kWh (new qualification point), but have an average monthly demand of less than 200 kW (old qualification point) will be allowed to participate in the SMB/DI program until July 31, 2019.

There is no upper limit of gas consumption that disqualifies a customer from receiving the gas measures offered by the SMB/DI program. The Company has delivered this program for more than two decades through a local vendor, who is known as the "Regional Program Administrator" or "RPA". The RPA is responsible for program management, data entry, and quality control. The RPA is located in Rhode Island, and employs local staff, local electricians and energy efficiency lighting materials procured through a competitive bid process. As of 2011, customers served by natural gas are also eligible for direct installation of natural gas energy efficiency measures.

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Mews Traven, Wakefield RI

Originally a small fishermen's tavern which opened in 1947, owners Dave and Danny have transformed Mews Tavern into a legendary Rhode Island restaurant and bar. Mews took advantage of National Grid's Small Business Program, after a free energy evaluation, they decided to move forward with recommended measures that helped decrease energy costs and their environmental impact.

The project achieved estimated Annual Energy cost savings of \$10,439 and Annual kWh Savings 77,750 kWh



Efficiency Improvements

Mews installed an Energy Management System and new energy efficient custom lighting.

Customers are provided turn-key services consisting of:

- An Energy Audit
- Direct Installation of Measures
- Company incentive contribution of up to 70% of the total project cost
- On-bill repayment (OBR) for eligible customer's project costs and a financing term to 60 months (never more time than to establish positive cash flow) at zero (0) percent interest or a lump sum payment with a 15% discount, resulting in most customers' projects having a positive cash flow when they choose the OBR repayment option.

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Since its inception when the SMB/DI Program focused primarily on lighting and refrigeration direct install measures, it has broadened its scope to include identifying:

- Cost-effective "custom" electric and gas measures, such as Energy Management Systems (EMS).
- Time dependent opportunities such as replacing roof top HVAC units and heating systems.
- Participation in residential programs where buildings may have both commercial and residential properties in the same buildings.

As noted previously, the Company is continuously working with its engineers and technical assistance experts to try and move as many measures from the custom category to prescriptive or “custom express” to streamline the process for customers as much as possible. This should encourage the vendor and the customer to install these measures more frequently and reduce the technical costs of the program.

In addition to cost-effective custom and time dependent measures mentioned above, the SMB/DI Program offers incentives on the following measures:

- LED lamps and luminaires
- Occupancy sensors and controls
- Energy Management Systems (EMS)
- Thermostats (including Wi-Fi)
- Insulation
- Hot water reset
- Low flow pre-rinse spray valves
- Refrigeration measures such as evaporator fan controls, efficient evaporator fan motors, automatic door closers and door heater control devices for walk-in coolers
- Pipe Insulation

b. 2019 Goals

For the 2019 Annual Plan, Small Business Direct Install has the following goals:

Electric

Demand Reduction (Annual kW)	Energy Savings (Annual MWh)	Customer Participation
1,005	10,021	565

Gas

Energy Savings (Annual MMBtu)	Customer Participation
2,559	30

Offering Changes

As part of an effort to increase participation in the Direct Install Small Business Program, in 2019, for the second year, the Company will target businesses as well as residents as

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part of the Community Initiative. Many residents are also small business owners. By targeting residential customers to learn about the Small Business Direct Install Program, the Company has an opportunity to tap a segment of its customer base that may have been hard to reach in the past. In 2018, small businesses in the towns of Woonsocket and Warren received bill inserts promoting the Direct Install Program as part of the Community Initiatives in those towns. Companies with fewer than 20 people represent 90.2% of all Rhode Island employers. Mid-sized companies with 20-99 employees represent 8.0% of private employment.*

Deleted: Approximately 20% of Rhode Island employees work for companies with less than 20 employees and close to 40% work for companies with less than 100 employees.¹⁴

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In 2019, the Company will explore how to work with the large commercial and industrial sector as well as the municipal sector in conjunction with the Community Initiative.

Overall, the Company has a strong foundation of experience delivering this program, which enables it to meet program goals and to continue to develop and implement new products and services. As a result of the Company's increased move to vertical market sectors to serve customers better, the following segments are no longer included in the small business segment:

- K-12 Schools
- National Chain Retail Locations and Restaurants
- Small Grocery Stores (not including convenience)
- Serve up Savings (Restaurants)

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Deleted: . The Company is planning to serve more SMB/DI customers in 2019 compared to 2017 and 2018, particularly through the Upstream Lighting, Upstream Kitchen Equipment, and Upstream HVAC initiatives

Deleted: These participants will be reflected in the other C&I programs.

Moved up [1]: In addition, the refrigerator/freezer recycling program offered to residential customers where old working refrigerators and freezers are picked up for \$50 each, is now open to small business customers.

The refrigerator/freezer recycling program offered to residential customers where old working refrigerators and freezers are picked up for \$50 each is now open to small business customers.

The Company fully acknowledges that this will affect the ability of the SMB/DI vendor to reach goals on par with previous years and has adjusted their goals accordingly for 2019. The movement to vertical markets from the SMB/DI program will also impact the level of participation in 2019.

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Small Business demonstration

In 2019 the Company will promote cold climate heat pumps, for small business customers who heat using oil. This could mean early replacement of equipment to cold

climate heat pumps or customer could use cold climate heat pumps as the primary heat source with oil as back up heat.

The company will look to incentivize installation of 20 heat pumps at customer sites.

The company hopes to learn about incentives needed to move small business customers to cold climate heat pumps, barriers for adoption, customer value proposition and non-energy benefits associated with installation and operation of cold climate heat pumps. The company will include audits and weatherization for customer sites as part of this installation.

6. C&I Connected Solutions (Demand Response)

The Company will be implementing active demand reduction based on the recent evaluated pilot efforts in 2017 and 2018. The active demand response program is called Connected Solutions. During the summer of 2017, National Grid deployed C&I active demand reduction pilots in RI. Customers with interval meters on G-02 or G-32 rates, with demand of 250 kW or higher and the ability to curtail 50 kW, were eligible for the demonstration. Under this active demand reduction approach customers agree to respond to an event call targeting conditions that typically result in system peak.

In 2017 a total of 12 MW demand reduction was enrolled and in 2018 a total of 27 MW are currently enrolled in the demonstration.

The demonstration project in 2017 and 2018, will serve as the basis for a new statewide C&I curtailment active demand reduction program offering in 2019 that is technology agnostic and provides an incentive for verifiable shedding of load in response to a signal or communication from the Company. Performance will be measured on MW reduction during event. Typical technologies or strategies used to curtail load include energy management systems, building management systems, software and controls, HVAC controls, lighting with controls (manual, networked system or integrated), process offsets, any Open ADR compliant technology, startup sequencing, among other customer facility specific approaches. Since the offering is technology agnostic, the Company will be able to incent the performance of customers adopting innovative and emerging demand reduction technologies, including battery storage technologies. Customers can use any technology or strategy at their disposal and be incentivized based on the performance of their curtailment. In essence, the incentive must be greater or equal to the customers opportunity cost, for them to curtail– if it makes

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sense for a customer to shed load for the incentive price paid to them by the Company, then the customer will curtail.

This initiative uses Curtailment Service Providers (“CSPs”) to assess curtailment opportunities at a facility and deliver curtailment services to enrolled customers. CSPs identify curtailment opportunities for deployment under the Company’s initiative, as well as demand charge and Installed Capacity (“ICAP”) tag¹⁵ management opportunities, and present a complete curtailment proposal to the customer. The demand charge and ICAP tag management provide opportunities for direct bill savings to customers.

Customers and CSPs respond to dispatch signals or criteria specified by the Company, generally using a system peak trigger. Events will be called the day before curtailment is needed. The core model remains focused on reducing demand during summer peak events typically targeting fewer than twenty hours per summer. The goal of the offering is to call events at times of peak energy use. For customers participating in ISO-NE demand response markets, ISO-NE event days will be excluded from baseline calculations. The program is structured to avoid interfering with the ISO-NE programs or penalizing customers for participating in both programs.

The customer value proposition for large C&I customers, subject to demand charges and/or ICAP tags, with means of controlling lighting, comfort, and/or process loads, is that they can use this solution to generate revenue by altering their operations a few times per year. The demand response program incentive, combined with any ISO-NE CSO obligation revenue, demand charge management, and ICAP tag management, round out a compelling package for customers to adjust operations.

The Company can add a new service offering to the portfolio to provide value to large C&I customers and generate claimable benefits, primarily avoided capacity, T&D, and capacity DRIFE.

Some technologies such as battery storage have the potential to be called for many DR events per year without disrupting customers’ operations. We will explore the added benefit of more DR events, and scale the customer incentive and marketing efforts to align with any additional benefits found.

¹⁵ Installed Capacity Tag is a capacity payment that is set for a customer by using their peak demand during the peak day/hour on the NEPOOL grid

In 2019, the Company will continue to explore demand response program opportunities for small business customers with direct load control technologies. The Company will look to incentivize energy efficient connected technologies through the energy efficiency programs and will explore opportunities to reduce peak load by providing incentives for automatic load reduction during demand response events. Technologies include Wi-Fi thermostats that control air conditioners, smart heat pump water heaters, smart electric water heaters and network lighting. In addition, the Company will explore other demand response-enabled technologies as they become available in the market. The Company will also explore opportunities in the connected space, with other non-energy Wi-Fi enabled technologies that may be an entry point or an engagement opportunity for energy efficiency and demand response with customers.

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7. Business to Business Marketing

In 2018, the Company continued to build awareness of, and increase participation in, its energy saving offerings for Rhode Island’s business customers. The Company did significant research to understand the mindset of its commercial and industrial customers including the completion of studies on its customers’ familiarity with energy saving offers and their satisfaction. The Company leveraged the results of these studies along with media habits research and behavior data in the development of a strategic communications plan. This year the Company has implemented a strategy of building awareness upfront with customers, which leads to increased program participation.

Business to Business Marketing will evaluate the strategy which was implemented in 2018 in which two campaigns were run in market in parallel: one dedicated to awareness, and the other focused at the program level to address the customer journey.

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Energy Efficiency Familiarity efforts focus on awareness stage of customer journey.

- Channels used: Broad-based TV, radio, print, digital
- Campaign intent is to touch every customer utilizing maximum reach channels to increase level of familiarity among all our customers.
- This campaign ties directly to the question customers respond to in the “Brand, Image and Relationship” (BIR).

Programmatic Focus marketing efforts on desire, research, and participation phase of customer journey

- Channels used: Pre-roll video, advertorials
- Primary messaging will focus on financial opportunities such as rebates, incentives, and 3rd party financing. Secondary messaging will continue to speak non-energy benefits of Energy Efficiency.
- Programmatic campaign will focus on the desire, research and participation phase of the customer journey.
- Messaging will ladder up to the Familiarity Campaign.

The Company is tracking its progress against these initiatives and based on performance will look to expand or pull back in 2019. The Company's main focus in 2018 will be to increase scores related to Energy Efficiency Familiarity. To track familiarity with the Company's energy saving offerings among business customers, the Company conducts ongoing research through its "Brand, Image and Relationship" (BIR) tracker. Commercial customers are surveyed via phone and are asked: How familiar are you with energy savings or incentive programs from National Grid to help you with ways to use less gas or electricity? The survey is conducted seven days per week, and the Company contacts 10 commercial customers per week. The results are reported on a quarterly basis and the Company has specified metrics and scores that it is measuring against.

In addition to these initiatives, the Company's annual Customer & Partner Energy Efficiency Summit (EE Summit) has helped cement its relationships with its largest customers. The EE Summit has been held at Gillette Stadium in Foxboro, MA since 2014. The EE Summit exemplifies the Company's customer focused philosophy, providing solutions that break through its customers' pain points and roadblocks. The summit's goal is to make the energy solutions the Company offers more accessible and easier to implement for its customers. It's also an opportunity for the Company to build personal relationships with its customers, sales teams and vendors. The Summit includes vendor partners and acclaimed speakers on teamwork, problem solving, sustainability, and innovative energy approaches. The Company's 2018 EE Summit will be held on October 25, 2018. A date for the 2019 Summit has not yet been planned.

While National Grid's paid media primarily targets people directly involved in the decision making process for capital budgets and facility improvements/projects, C-Suite & Facility Managers, Small Business owners, the Company does have some advertising/communications dedicated to our secondary audience of key influencers. These are the people/firms that influence energy project go-forward decisions. They

[may have an existing relationship with the customer. Distributors, Project Expeditors, Engineers, Architects, etc. Our newsletter has a "trade corner". The trade ProNet website \(www.ngrid.com/pronet\) was awarded Top 10 in Chartwell's 2017 Best Practices Awards.](#)

B2B Newsletter Sample:



FW EXT Its here the latest in energy savings..msg

Pronet Award:



Program
Marketing - Tra...

8. Appendices

a. Appendix 1 Sample list of custom measures in the energy efficiency program

Building envelope measures

- Fenestration
- Insulation

Laundry systems

- Polymer bead systems
- Ozone systems

Commercial kitchen measures

- Large dishwashing systems
- Heat recovery for water heating from
 - Cooking surface exhaust
 - Large refrigeration

Field Code Changed

Field Code Changed

Deleted: In 2017, the Company continued to build awareness of, and increase participation in, its energy saving offerings for Rhode Island's business customers. The Company did significant research to understand the mindset of its commercial and industrial customers including the completion of studies on its customers' familiarity with energy saving offers and their satisfaction. The Company leveraged the results of these studies along with media habits research and behavior data in the development of a strategic communications plan. Four key initiatives were identified as opportunity work streams that would help us achieve the goal of broadening customer engagement with energy efficiency:¶

<#>**Market Tiers:** Increasing commercial customers' familiarity with the Company's energy saving offerings is a key component of ensuring all Rhode Island businesses have the opportunity to participate in these programs. A strategy was identified to help the Company achieve this goal in the fall of 2016. It was determined that in order to increase overall EE Familiarity the marketplace of commercial customers must be tiered, enabling an increase in outreach to customer segments that are less likely to be aware of National Grid's programs and offers. The Company's marketing and customer insights teams collaborated to identify market tiers by analyzing over three years of monthly EE Familiarity survey data. This effort led to a creative problem solving workshop where it was determined that very small businesses (less than twenty employees) without access to a facilities manager were least likely to be aware of the Company's programs. Marketing outreach was then allocat...

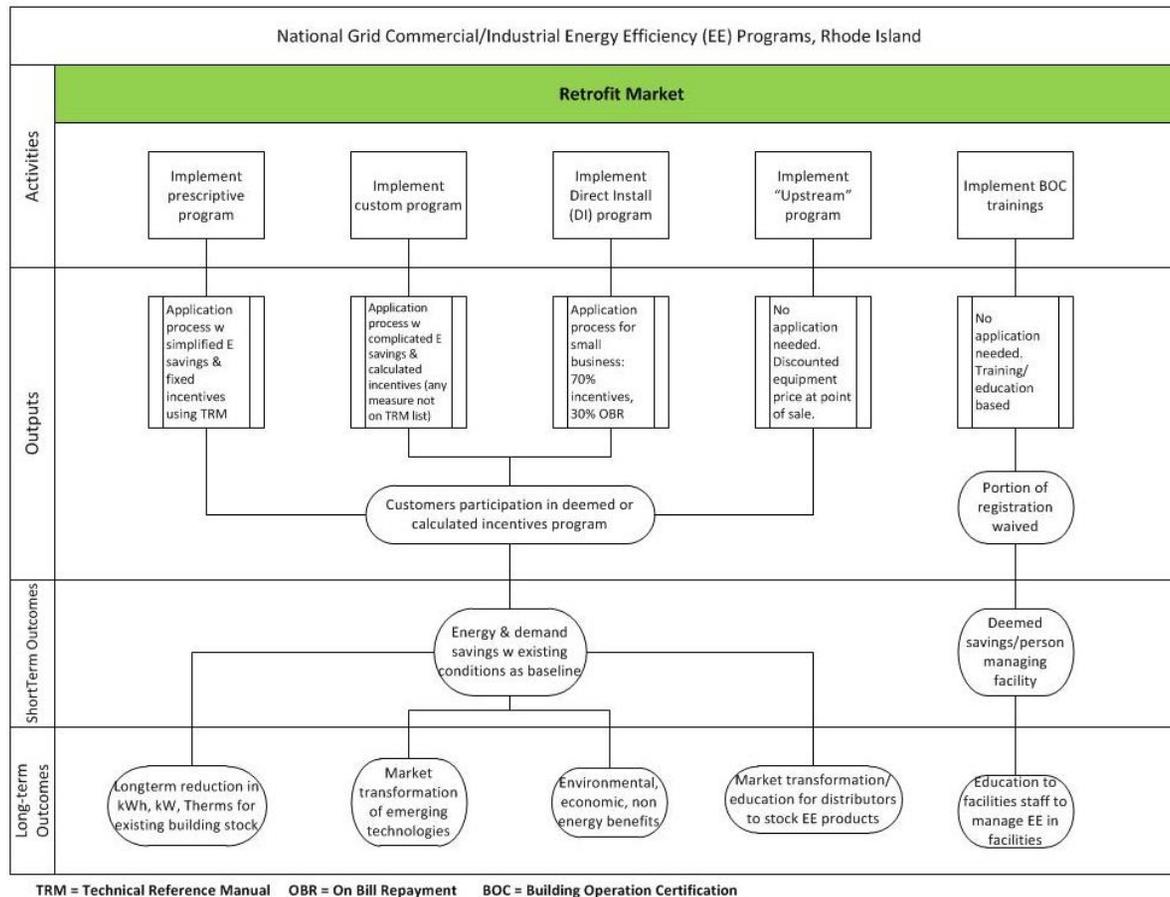
Manufacturing

- Process improvements
- Energy efficient production equipment
- Specialized lighting
- Compressed air

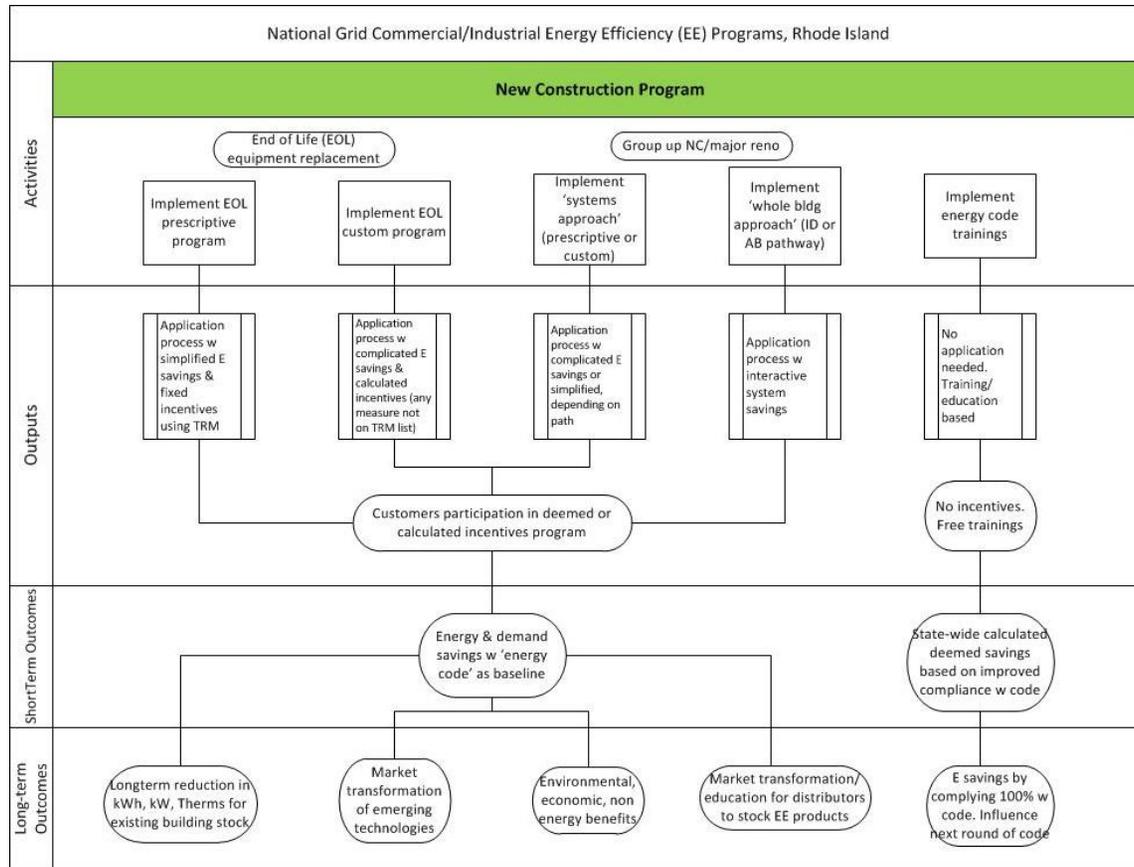
HVAC

- Variable refrigerant flow systems
- Energy recovery ventilation (ERV)
- Air source and water source gas engine driven heat pumps
- Smart HVAC monitoring and control systems
- Dry Smart gas dryers

c. Appendix 2: Retrofit Logic Model



d. Appendix 3: New Construction Logic Model



e. **Appendix 4: Subprogram and Measure Savings Goals and Incentives**

Comment [JR5]: To be updated in 2nd draft.

Electric Subprogram Net Savings Goals and Incentive Descriptions

Electric Programs			
Program	Subprogram	Annual kWh Goal	Incentive
Large Commercial New Construction	Compressed Air	960,700	Typically up to 75% of Incremental Cost
	Upstream HVAC	3,698,695	
	Custom	7,339,520	
	Lighting	1,223,341	
	Variable Speed Drive	486,262	
	C&I Codes	250,500	
Large Commercial Retrofit	Custom	25,322,055	Typically up to 50% of Project Cost
	HVAC	1,868,256	
	Lighting	8,823,318	
	Variable Speed Drive	2,814,360	
	Combined Heat Power	6,399,200	
	Upstream Lighting	24,073,560	
	Street Lighting	6,315,000	
Small Business Direct Install	Small Commercial Industrial	9,940,477	70% of Project Cost 30% Financed

Gas Program Measure Group Description with Quantity and Rebate Levels

Gas Programs			
Program	Measure	MMBtus	Rebate Level
Large Commercial New Construction	Boiler95	873	\$ 1,500
	CODES AND STANDARDS	5,000	\$ 63,000
	COMBO COND BOIL/WTR HTR 90+	309	\$ 1,500
	COND UNIT HEATER 151-400 MBH	128	\$ 750
	Condensing boiler <= 300 mbh	250	\$ 1,500
	Condensing boiler 1000-1700 mbh	619	\$ 7,500
	Condensing boiler 1701+ mbh	1,084	\$ 10,000
	Condensing boiler 300-499 mbh	513	\$ 2,000
	Condensing boiler 500-999 mbh	943	\$ 4,000
	COOKING-COMBO OVEN 1	208	\$ 1,000
	COOKING-CONVECTION OVEN 1	577	\$ 1,000
	COOKING-CONVEYOR OVEN 1	53	\$ 1,000
	COOKING-FRYER-1000	1,104	\$ 1,000
	COOKING-STEAMER-1000	134	\$ 1,000
	Furnace95ECM	68	\$ 500
	Furnace97ECM	25	\$ 800
	INFRARED HEATER - LOW INT	188	\$ 750
	WATER HEATER TANK 0.67 EF	347	\$ 152
	Water Heating Boiler - 85% TE	28	\$ 152
	Water Heating Boiler - 92% TE	69	\$ 152
	COMBO COND BOIL/WTR HTR 95+	4,673	\$ 152
	COND WATER HEATER 90%MIN 75-800	3,387	\$ 152
Custom	32,936	Up to 75% of Total Resource Cost	
Large Commercial Retrofi	BOILER RESET MULTI-STAGE	67	\$ 225
	Builder Operator Certification	1,336	\$ 518
	LF_SHWR_HD_1.75_GPM_DI	490	\$ 200
	Pre Rinse Spray Valve	513	\$ 25
	STEAM TRAPS	28,611	\$ 50
	THERMOSTAT	30	\$ 25
	WiFi Thermostat - cooling and htg	653	\$ 100
	WiFi Tstat-heat only	653	\$ 100
Custom Retrofit	155,585	Up to 50% of Total Resource Cost	

Gas Programs			
Program	Measure	MMBtus	Rebate Level
Small Business Direct Install	BOILER RESET 1 STAGE	137	\$ 420
	FAUCET_AERATOR_0.5_DI	329	\$ 11
	INS_DUCT_SF	3	\$ 8
	INSUL_PIPE_DI_1.5IN_H2O	81	\$ 6
	INSUL_PIPE_DI_2IN_H2O	3	\$ 8
	LF_PRE_RINSE_SPRAY_NZL	937	\$ 100
	LF_SHWR_HD_1.75_GPM_DI	754	\$ 25
	SALON_NOZZLE	395	\$ 100
	THERMOSTAT	1,003	\$ 126
C&I Multifamily	Air Sealing_MF	2,513	Average Incentive based on measure mix
	CUST NON-LGT_MF	234	
	Faucet Aerator_MF	219	
	Insulation_MF	5	
	Low-Flow Showerhead_MF	55	
	Pipe Wrap (Water Heating)_MF	27	
	Programmable Thermostat_MF	1,111	
	TSV Showerhead_MF	271	