2020 Pilots

I. Summary

In 2019 the Company redefined what it considers a pilot in accordance with the Docket No. 4600-A PUC Guidance Document.

> Pilot: As defined in the Docket 4600-A Guidance Document, "A pilot is a small scale, targeted program that is limited in scope, time, and spending and is designed to test the feasibility of a future program or rate design. It is incumbent upon the proponent of a pilot to define these limits in a proposal for PUC review. Ideally, a pilot can provide net benefits and achieve goals, but the primary design and value of a pilot is to test rather than to achieve."[1]

This attachment summarizes each pilot and describes the manner in which it advances, detracts, or remains neutral on achieving the Docket 4600 goals for the electric and gas system.

Pilots are designed to explore technologies and approaches to energy management not included in the core energy efficiency programs (Residential, Commercial and Industrial, and Multifamily).

Pilots enable the Company to test technologies, new energy management strategies, customer adoption, workforce adoption and cost effectiveness of emerging and new technologies. If a pilot is successful for commercialization, new programs and measures may be added to existing core programs.

For actions in the Plan that do not fall under the Docket 4600-A definition of pilots, the Company proposes the following definitions for demonstrations and assessments:

- Demonstration: A demonstration tests a new technology or solution that is delivered as part of an existing program where a technical assessment has estimated the savings and determined that the measure is likely to be cost effective. An example of a demonstration was beneficial electrification of heat in the HVAC program in 2018.

[1] Docket No. 4600-A PUC Guidance Document, October 27, 2017. Section V. Pilots.

- Assessment: An assessment tests a measure, a bundle of measures, or a solution, that can be delivered as part of existing program where the savings are not known but will be explored as part of the assessment. An example of an assessment is automated window shades in the C&I retrofit program.

The following pilots are proposed for 2020 in the Residential, Commercial and Industrial, and Multifamily market segments.

Summaries of proposed 2020 demonstrations and assessments are included within Attachments 1 and 2 as part of the core program descriptions. These categories are expected to contribute savings to the programs in which they are offered. These categories are therefore included as part of a program's total planned costs, benefits, and savings. These categories are included in the overall cost-benefit ratio of the Plan and they are included in the calculation of the shareholder incentive.

II. Commercial and Industrial (C&I) Pilots

In 2020 the National Grid C&I team will continue to focus on new lighting technologies and lighting go-to-market strategies, industrial technologies and go-to-market approaches, new construction demonstrations as well as demand response demonstrations. Please refer to Attachment 2 Commercial and Industrial Programs, Section 3 in for a detailed list of all demonstrations and assessments. The detailed descriptions for these demonstrations and assessments are under the various programs in the C&I section.

The Company is proposing two C&I pilots for 2020 listed below:

Commercial and Industrial Pilots					
	Name	**Goals and Scope**	**Duration**	**2020 Budget**	**2020 Savings**
1	Pathway to Zero Energy Buildings	To advance interest in Zero Energy Buildings in Rhode Island with education and awareness, training and marketing and launching two new Zero Energy Building (ZEB) pilot projects in the 2019-2020 timeframe and test zero energy design, operation and collect	2018-2020	$86,296	Not determined

		customer feedback from building owner, designer and occupants. The goal is to inform the design of a Zero Energy Building Program in 2021-2023			
2.	Gas DR Pilot	Reduce gas consumption with large commercial customers during the winter season, with an expanded gas demand response offering in conjunction with existing peak period demand response offering offered in the winter of 2018-2019.	2019 - 2020 winter	$1,234, 015	42.5 Dekatherms per hour (2019-2020 winter)

1. Pathway to Zero Energy Buildings Pilots

In 2018 National Grid initiated a Zero Energy Building (ZEB) pilot to advance interest in the RI building industry for ZEB's and a path to zero energy buildings. To accelerate these efforts National Grid will continue to focus on four areas to advance ZEB's in 2020.

1. Education and awareness: This includes educational Forums and Seminars on a bi-annual basis that provide education and information specific to achieving low Energy Use Intensity (EUI) targets in commercial buildings as a pathway to Zero Energy Buildings. These educational Forums and Seminars will be coordinated with the residential Zero Energy Building efforts as there are overlaps with projects like multifamily and with the design and building community at large. The Company plans to develop a website dedicated to information to ZEB design and engineering to achieve ZEB goals.

2. Marketing: Providing case studies and information on Zero Energy Building strategies for the building industry and owners and developers via various channels, including online and via newsletters.

3. Training: Providing training and access to trainings for building industry professionals and contractors.

4. Zero Energy Building projects: Identifying projects with owners, developers and architects that can achieve Zero Energy targets and providing technical expertise,

financial incentives, commissioning and post occupancy verification for these projects, as a way to learn and help design and launch a full Zero Energy Building program in the future.

Early market assessment in 2018 indicated that there is interest in the market for ZEB multifamily projects, higher education as well as a potential for K-12 school projects. In 2020 there is a potential for ZEB schools in Rhode Island and the Company will purse and support these projects under the State SEMP agreement. 2018 the Company developed criteria for Zero Energy projects as a way to solicit project partnerships with owners, developers and architects and will continue these efforts to identify projects in 2020.

Pathway to Zero Energy Buildings Pilot	
4600 Goals for Electric System	**Advances/Detracts/Neutral**
Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the long term (this applies to all energy use, not just regulated fuels).	Advances low energy use buildings and clean energy with renewables on site. Provides bill reduction and therefore operational savings due to higher energy efficiency coupled with renewables on site. Provides healthier buildings that are more comfortable. Improvements in customer empowerment and choice
Strengthen the Rhode Island economy, support economic competitiveness, retain and create jobs by optimizing the benefits of a modern grid and attaining appropriate rate design structures.	This pilot has the potential to provide new local job opportunities through the construction activities and on-going site maintenance. Participating in, and acknowledgement of, these programs increases awareness of job opportunities in emerging and sustainable energy sources, which can generate interest in these jobs and create future local jobs in these areas. Creates high performing environments that boost

	economic growth
Address the challenge of climate change and other forms of pollution.	Pilot advances carbon savings with energy efficiency and renewable energy.
Prioritize and facilitate increasing customer investment in their facilities (efficiency, distributed generation, storage, responsive demand, and the electrification of vehicles and heating) where that investment provides recognizable net benefits.	Investments in Zero Energy Buildings create more value for building owners
Appropriately compensate distributed energy resources for the value they provide to the electricity system, customers, and society.	Neutral – this pilot is neutral on this goal. The Company will explore customer compensation for the locational benefits to the system as ZEB market scale and emerges.
Appropriately charge customers for the cost they impose on the grid.	The current ZEB pilot will not disproportionally impact the gird at the moment. At scale ZEB's have the potential to disproportionally impact (cost) customers who do not have renewables on site. This Company will explore impacts as this market emerges.
Appropriately compensate the distribution utility for the services it provides.	Neutral – this pilot is neutral on this goal.
Align distribution utility, customer, and policy objectives and interests through the regulatory framework, including rate design, cost recovery, and	This pilot advances this goal by putting incentives towards energy efficiency measures and solutions that helps to achieve the GHG reduction goals of the Resilient Rhode Island Act of 2014 and the Rhode Island GHG Emissions Reduction Plan of 2016.

incentive.	

2. Gas Demand Response Pilot

Overview

The Company has been utilizing electric Demand Response (DR) to address grid constraints and help provide reliable service to our customers. Until recently, DR offering for customers was limited to the electric market. The Company is currently testing gas DR projects in its NY territory, conducting a study of the potential for gas demand response in MA with Fraunhofer Center for Sustainable Energy, and laying the groundwork for a pilot in RI. In the 2018-2019 winter, the Company launched a Peak Period Gas Demand Response (PPDR) pilot project, that rewards customers for shifting their usage outside of the peak-period of the gas system (6AM-9AM). This program works well for commercial and industrial customers who have intra-day flexibility of their natural gas usage. Customers in this program would be able to provide their demand reduction via either fuel-switching or demand control (e.g. thermostat setback). The Company currently has a single C&I customer enrolled in this program, however the Company believes that many proposed changes to the program outlined below are likely to lead to increased participation among other candidate customers in RI.

With gas DR the Company will test distribution system benefits, reduction of gas system peak demand via a reduction in overall natural gas consumption, customer adoption of gas DR and incentive levels to drive participation. An in-depth study will also be completed to quantify winter demand benefits. Testing gas DR will allow the Company to understand the impact on gas and electric systems and whether National Grid's role in the market influences rates of adoption.

While the Company plans to target achieving 42.5 DTh of hourly peak reduction in 2020, with the below stated DR offerings, this target is dependent on enrollment levels and setting an appropriate incentive level to drive participation. Since 2019-2020 will be the second year of this pilot, the budget for this pilot is an estimation based on the Company's current understanding of the customer base and market drivers that will move customers to participate.

Pilot Delivery

The gas DR pilot involves the installation of data recording hardware that provides granular usage data for participating customers. Data from the pilot will be evaluated each year, and a summary report being produced in 2020 and 2021.

In the winter of 2018-2019 four Gas DR events were called and an average peak hour reduction of 18 DTh was achieved.

Customer segment addressed*:* The gas DR pilot is focused on large, firm commercial and industrial customers, specifically those that have gas equipment that can be curtailed without creating an unsafe environment. The goal of the project is to test the following:

- Are customers interested in participating in an incentivized Gas Demand Response program?
- If so, what are the acceptable price point values by customer SIC code and equipment type?
- What are the distribution system benefits?
- What is the scalability of the program?

Initial benefit cost analysis indicates that the Peak Period Demand Response program has a pathway to being cost effective. A more detailed analysis will be conducted in 2020 to determine results and inform the 2021-2023 Energy Efficiency Plan. Please refer to the Main Text, Section 6. xi on Pilots, Demonstration and Assessments for evaluation process.

Changes in 2020

The Gas Peak Period Demand Response (PPDR) pilot will continue in the winter of 2019-2020, with some modifications and expanded with the launch of an additional Gas DR pilot offering, called Extended Demand Response (EDR).

Peak-Period Demand Response: In 2019- 2020 the Company will expand participation in PPDR. The Company has made modifications to the existing pilot offering that was launched in 2018, and these changes will take effect in the fall of 2019, for the winter of 2019-2020. The modifications match many of the current terms of the pilot program launched in 2018. The proposed pilot program details are:

- Limits will exist to the number of events that National Grid can call during a given winter.
- Customer participation in this program and the called events will be compensated via direct incentive payments, not in the form of a reduced rate.

- While enrolled customer participation in called events will be mandatory, this participation will be enforced through contractual structures and financial penalties – National Grid will not maintain a unilateral right to disrupt gas service to participating customers during called events.

  Incentive structure: Customer compensation for participation in the PPDR program will be based on a combination of 'availability and 'energy' payments. Each of these rates will be standard offers to all customers, though customer earning opportunity will vary based on the volume of peak hour Dth reduction that each customer can commit to and deliver.

  Extended Demand Response (EDR): For the winter of 2019-2020 the Company is in the process of developing an offering called the Extended Demand Response pilot program offering, which will provide a meaningful reduction in the peak load requirement in the system. The Extended Demand Response program will reward those customers who have inter-day flexibility of their natural gas usage.

  While the basis parameters of this program would match those of the peak period program, customers in the extended program would only be allowed to provide their demand reduction either via fuel-switching or via an arrangement where National Grid maintains control over their equipment and could ensure demand reduction. The duration of each event would be a minimum of 24 hours (6AM on day 1 until 6AM on day 2). Limitations will also be put in place that will limit the number of consecutive days on which any individual customer could be called to participate in the extended demand response program. National Grid will have the right to call up to 6 events during the winter at the stated incentive rate.

  The EDR program will provide incentives for customers who can shift their usage outside of a given day by switching to an alternative source (most typically fuel oil) to meet their energy needs. These alternative systems will be owned by the customer (though National Grid will provide up-front incentives to off-set purchase and installation costs for customers requiring new equipment in order to participate), with the ongoing O&M needs met by the owner. The customer will be responsible for operation of the system during an event day.

  Incentive Structure: Customer compensation for participation in the EDR program will be based on the same combination of 'availability' and 'energy' payments outlined in the PPDR program description. Each of these rates will be standard offers to all customers, though

customer earning opportunity will vary based on the volume of peak hour DTh reduction that each customer can commit to and deliver.

Gas Demand Response	
4600 Goals for Gas distribution System	**Advances/Detracts/Neutral**
Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the long term (this applies to all energy use, not just regulated fuels).	DR has the potential for many value streams, such as alleviating local distribution system constraints, increasing system flexibility, potentially delaying infrastructure reinforcement projects, and providing a revenue stream for participants.
Strengthen the Rhode Island economy, support economic competitiveness, retain and create jobs by optimizing the benefits of a modern grid and attaining appropriate rate design structures.	DR has the potential for many value streams, such as alleviating local distribution system constraints, increasing system flexibility, potentially delaying infrastructure reinforcement projects, and providing a revenue stream for participants that would support economic growth.
Address the challenge of climate change and other forms of pollution.	While demand response does not directly address climate change, the additional insight into usage due to the increased data resolution provided to participants may create an opportunity for additional energy efficiency projects. Additionally, there may be a reduction in carbon due to participation in DR events.
Prioritize and facilitate increasing customer investment in their facilities (efficiency, distributed generation, storage, responsive demand, and the electrification of vehicles and heating) where that investment provides recognizable net	Neutral

benefits.	
Appropriately compensate distributed energy resources for the value they provide to the gas system, customers, and society.	Neutral – this pilot is neutral on this goal.
Appropriately charge customers for the cost they impose on the grid.	Neutral – this pilot is neutral on this goal.
Appropriately compensate the distribution utility for the services it provides.	Neutral – this pilot is neutral on this goal.
Align distribution utility, customer, and policy objectives and interests through the regulatory framework, including rate design, cost recovery, and incentive.	Gas DR pilot advances this goal by putting incentives towards peak reduction on the gas distribution network that helps to achieve the GHG reduction goals of the Resilient Rhode Island Act of 2014 and the Rhode Island GHG Emissions Reduction Plan of 2016. There is also an alignment in the sense that customer participation could affect system planning, which could have a larger financial impact for all customers. In this way, participants are incentivized for providing the behavior that matches the goals of the company.

III. Residential Pilot Project

1. Pathway to Zero Energy Homes

In 2020 the Residential New Construction Team will focus on building the zero-energy ready and Passive House markets in Rhode Island. The pilot began in 2018 and will continue into 2020 in an effort to develop professional expertise, test the effectiveness of enhanced incentives, and test the energy efficiency of projects that achieve zero-energy ready or Passive House certification.

Residential Pilots					
	Name	**Goals and Scope**	**Duration**	**2020 Budget**	**2020 Savings**
1	Pathway to Zero Energy Homes Pilot	Provide enhanced incentives to projects that achieve zero energy ready or Passive House homes. Continue to support the professional development of the RI building community to become certified zero-energy and/or Passive House certified builders. Test zero energy design and operation and collect customer feedback from project team and occupants. The goal is to inform the design of a Zero Energy Building Program in 2020-2021	2018-2020	$186,850	Not determined

In 2018, the Company initiated the Zero Energy Homes Pilot to help to accelerate the zero energy market in Rhode Island. This pilot will continue into 2020 in order to build upon the following four main market segments:

1. Education and Awareness
    a. Stakeholder Forums
    b. Communications
    c. Tours
    d. Home Show
2. Workforce Development
    a. Zero Energy and Passive House Training
    b. Marketing
    c. Project Certification

3. Project Incentives
    a. Components to get to zero energy ready
4. Marketing
    a. Zero Energy in RI – case studies

This pilot intends on funding these segments to test the following:

1. If there will be an increase in zero energy homes as a result of increased number and promotion of trained professionals
2. If there will be additional savings from high efficiency homes plus one of the proposed pathways to zero energy.

Pathway to Zero Energy Buildings Pilot	
4600 Goals for Electric System	**Advances/Detracts/Neutral**
Provide reliable, safe, clean, and affordable energy to Rhode Island customers over the long term (this applies to all energy use, not just regulated fuels).	Advances low energy use new construction and major renovations and creates the infrastructure for all-electric homes and on-site renewables. Provides bill reduction compared to baseline new construction homes and therefore operational savings due to higher energy efficiency coupled with renewables on site. Provides healthier buildings that are more comfortable. Improvements in customer empowerment and choice
Strengthen the Rhode Island economy, support economic competitiveness, retain and create jobs by optimizing the benefits of a modern grid and attaining appropriate rate design structures.	This pilot has the potential to increase the professional capabilities of the RI residential home building industry. The program will support the advancement of rate design structures by incentivizing all electric homes as well as smart homes. The Program will be marketed through home tours, webinars, mail/email communication, the

	RI Home Show and collaboration with RI residential industries. Creates high performing environments that boost economic growth
Address the challenge of climate change and other forms of pollution.	Pilot promotes carbon savings via all electric homes and building in the infrastructure for electric vehicles (EVs) and photovoltaic energy (PV).
Prioritize and facilitate increasing customer investment in their facilities (efficiency, distributed generation, storage, responsive demand, and the electrification of vehicles and heating) where that investment provides recognizable net benefits.	This Program will facilitate the investment in a zero energy home based on the additional technical design and construction assistance and additional incentives. A zero energy home will also be the foundation for a smart home with innovative technologies for full automation. It will serve the needs of those who want the lease amount of reliance on the grid, who want to reduce their carbon footprint and who want to be leaders in the fast paced technology and automation trends.
Appropriately compensate distributed energy resources for the value they provide to the electricity system, customers, and society.	Neutral – this pilot is neutral on this goal. The Company will explore customer compensation for the locational benefits to the system as ZEB market scale and emerges.
Appropriately charge customers for the cost they impose on the grid.	The current ZEB pilot will not disproportionally impact the gird at the moment. At scale ZEB's have the potential to disproportionally impact (cost) customers who do not have renewables on site. This Company will explore impacts as this market emerges.
Appropriately compensate the distribution utility for the services it provides.	Neutral – this pilot is neutral on this goal.

Align distribution utility, customer, and policy objectives and interests through the regulatory framework, including rate design, cost recovery, and incentive.	This pilot advances this goal by putting incentives towards energy efficiency measures and solutions that helps to achieve the GHG reduction goals of the Resilient Rhode Island Act of 2014 and the Rhode Island GHG Emissions Reduction Plan of 2016.