**Before the Public Service Commission**

**THE BROOKLYN UNION GAS COMPANY d/b/a NATIONAL GRID NY AND KEYSPAN GAS EAST CORPORATION d/b/a NATIONAL GRID**

**Direct Testimony**

**of the**

**Future of Heat Panel**

**Dated: April 2019**

## Table of Contents

## I. Introduction and Qualifications

**Q. Please introduce the members of the Future of Heat Panel.**

A. The Panel consists of Donald Chahbazpour, Lisa M. Tallet, Arthur W. Hamlin, and Owen S. Brady.

**Q. Mr. Chahbazpour, please state your name and business address.**

A. My name is Donald Chahbazpour. My business address is One MetroTech Center, Brooklyn, New York 11201.

**Q. By whom are you employed and in what capacity?**

A. I am employed by National Grid USA Service Company, Inc. ("National Grid Service Company"), a subsidiary of National Grid USA ("National Grid"), and currently hold the position of Director of Gas Utility of the Future. My responsibilities include leading efforts to reduce methane and carbon emissions through policy, strategy, and technology for National Grid's operating companies, including The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies"). I am also responsible for engaging stakeholders to raise awareness regarding the potential of renewable natural gas ("RNG").

**Q. Please describe your educational background and business experience.**

A. I received a Bachelor of Science in Mechanical Engineering from New Jersey Institute of Technology in 1998 and a Master of Public Administration from Columbia University's School of International and Public Affairs in 2000. Prior to working at National Grid, I worked for a startup energy technology company. I joined National Grid in 2004 and have held various positions of increasing responsibility in strategic planning, energy procurement, mergers and acquisitions, gas operations, and regulatory and customer strategy.

**Q. Ms. Tallet, please state your name and business address.**

A. My name is Lisa M. Tallet. My business address is 300 Erie Boulevard West, Syracuse, New York 13202.

**Q. By whom are you employed and in what capacity?**

A. I am employed by National Grid Service Company and currently hold the position of Director of New York Customer Energy Management. My responsibilities include the policy, design, and strategy for the energy efficiency programs that support the New York Public Service Commission's (the "Commission") clean-energy targets set forth in the

December 13, 2018 *Order Adopting Accelerated Energy Efficiency Targets* in Case 18-M-0084 (the "December 2018 EE Order").

**Q. Please describe your educational background and business experience.**

A. I received a Bachelor of Business Administration from St. Bonaventure University in 1985. I worked for New York State Electric and Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") from 1991 to 2007, where I held positions of increasing responsibility working on gas marketing, customer service, customer advocacy, and low-income programs. I joined National Grid in September 2007 and have held positions of increasing responsibility in customer financial services, energy efficiency implementation, policy, and strategy and evaluation. I assumed my current role in August 2018.

**Q. Mr. Hamlin, please state your name and business address.**

A. My name is Arthur W. Hamlin. My business address is 300 Erie Boulevard West, Syracuse, New York 13202.

**Q. By whom are you employed and in what capacity?**

A. I am employed by National Grid Service Company and currently hold the position of Manager, Economic Development, with responsibility for managing National Grid's portfolio of economic development programs, including programs that have provided enduring benefits to customers and communities in the Companies' respective service territories.

**Q. Please describe your educational and professional background.**

A. I received a Bachelor of Science from the University of Michigan in 1981, majoring in environmental policy and management. In 1982, I received a Master of Science in resource economics, also from the University of Michigan. I was employed for five years as an economist for the U.S. Department of Labor in Washington, D.C., and was subsequently hired by Niagara Mohawk Power Corporation d/b/a National Grid ("NMPC") in 1989. Since that time, I have held a variety of positions with National Grid, including leadership roles in the economic development, corporate citizenship, and market research functions.

**Q. Please briefly describe your current areas of responsibility for National Grid.**

A. I am responsible for managing National Grid's economic development activities and programs, which feature initiatives that support sustainable economic growth in communities throughout the Companies' service territories.

**Q. Mr. Brady, please state your name and business address.**

A. My name is Owen S. Brady. My business address is One MetroTech Center, Brooklyn, New York 11201.

**Q. By whom are you employed and in what capacity?**

A. I am employed by National Grid Service Company and currently hold the position of Product Management Specialist in the Emerging Products group. My responsibilities include developing the business models, technical design, and strategy for new product offerings that will meet customers' changing energy needs. Additionally, I currently manage the Companies' Gas Demand Response Demonstration Project, which the Commission adopted in Cases 16-G-0058 and 16-G-0059 (the "2016 KEDNY and KEDLI Rate Cases").

**Q. Please describe your education background and business experience.**

A. I received a Bachelor of Science in Mechanical Engineering from the University of Vermont in 2010. Thereafter, I worked for Vermont Gas Systems from 2011 until 2017, where I held positions of increasing responsibility in areas of strategic planning, policy development, and customer-account management. In 2017, I was hired by National Grid as a member of the New Energy Solutions group, where I was responsible for managing demonstration projects and overseeing investment in research and development. In August 2018, I assumed my current role. I am also enrolled in an Executive MBA program through Columbia University and the London Business School, with an expected graduation date of February 2020.

## II. Purpose of Testimony

**Q. What is the purpose of the Panel's testimony?**

A. As the energy provider to nearly two million customers in downstate New York, the Companies are committed to advancing clean energy solutions that further National Grid's commitment to environmental stewardship. Today, demand for natural gas remains strong, as customers seek a cost-effective, reliable heating source that generates fewer emissions than alternatives such as heavy oil. In this way, natural

gas continues to play a critical role in driving economic opportunity in New York. Yet, with the challenges presented by climate change, the State, the Commission, and the Companies recognize that more is needed to meaningfully change the current climate trajectory.

Governor Cuomo committed to aggressively pursuing clean energy policies aimed at reducing greenhouse gas emissions from the energy sector 40 percent (from 1990 levels) by 2030 and the longer-term goal of decreasing total carbon emissions 80 percent by 2050, as well as an aggressive new renewable energy goal that 100 percent of electricity consumed in New York be carbon neutral by 2040. For its part, National Grid similarly launched its "Northeast 80x50 Pathway" (the "80x50 Pathway") complementing New York State's efforts. The Companies' gas networks will play an integral role in meeting these ambitious goals and delivering the low-carbon economy of the future.

The purpose of this testimony is to set forth the Companies' vision for the future of the heating sector; a vision aimed at achieving those shared goals through a comprehensive plan built on the Companies' core obligations to provide safe, reliable, and affordable gas service to customers in New York. As more fully discussed below, the Companies

are sponsoring a suite of proposals directed at: (i) reducing methane emissions from the gas distribution system; (ii) achieving greater energy efficiency; (iii) promoting demand response and other non-pipes alternatives ("NPAs"); (iv) encouraging the development of sustainable heating options; (v) promoting economic development through investment in energy infrastructure; (vi) reducing carbon emissions on the gas network; and (vii) supporting further research, development, and demonstration ("RD&D") to advance RNG technologies.

**Q. Please describe the Companies' vision for the future of the heating sector.**

A. National Grid's vision for a sustainable gas future in New York is founded on a core commitment to exceed the expectations of its customers and communities while making possible the energy systems of tomorrow. Delivering on this vision requires a proactive, customer-centric, mission-driven approach – an approach that combines the Companies' ongoing obligation to provide safe, affordable, and reliable gas service with a renewed focus on advancing clean energy goals. To do this, the Companies developed a four-pronged strategy that establishes the goals, tools, and incentives for driving meaningful change in the heating sector:

*Reducing methane emissions from the gas distribution system 60 percent by 2035:* Building on the 80x50 Pathway, National Grid proposes an aggressive goal of reducing total network methane emissions 60 percent by 2035; continuing its leadership role in national initiatives aimed at reducing emissions; identifying, prioritizing, and repairing large-system leaks; and implementing work procedures to further reduce emissions going forward.

*Empowering and Enabling Customers to Sustainably Meet Their Heating Needs:* The Companies have developed a suite of programs, products, and demonstration projects aimed at empowering and enabling customers to take control of their energy usage through: incorporation of accelerated energy efficiency goals consistent with budgets and targets set forth in the Commission's December 2018 EE Order; access to RNG supplies through a Green Gas Tariff offering; an expanded Gas Demand Response Demonstration Project that complements the Companies' robust interruptible ("IT") and temperature control ("TC") service offerings; the development of a Sustainable Heat Initiative that includes deployment of geothermal heat pump technology, support for clean oil-to-gas conversions, and additional heating-related technology for low-to-moderate income ("LMI") customers; as well as enhanced economic

development programs capable of driving environmentally beneficial outcomes.

*Reducing Carbon Emissions on the Gas Network:* The integration of RNG and other sustainable gas supplies will reduce the carbon footprint of the Companies' gas networks. To facilitate carbon reductions through the integration of RNG supplies, the Companies propose to: deliver the Newtown Creek RNG project – one of the first projects in the U.S. to directly inject RNG into a local distribution system using biogas generated from a wastewater treatment plant and food waste; coordinate with the Department of Energy's National Renewable Energy Laboratory ("NREL") and potentially partner with New York City ("NYC") to develop a power-to-gas ("P2G") demonstration project that will convert excess renewable electricity to RNG and show how the gas system can serve as a long-term storage solution for renewable energy supplies; study, in coordination with Stony Brook University's Institute of Gas Innovation and Technology ("I-GIT"), the opportunities and challenges with blending hydrogen into the gas distribution system; eliminate barriers to RNG interconnections, and facilitate and incentivize new RNG projects through Company ownership of portions of the

interconnection equipment; and continuing productive end-use RD&D activities.

*Performance-Based Incentives and Revenue Sharing:* To align the Companies' incentives with a sustainable vision for the future of the heating sector and overarching energy policy goals, the Companies propose three Earnings Adjustment Mechanisms ("EAMs"), two Platform Service Revenue ("PSR") opportunities, and a NPA Incentive Mechanism.

**Q. Please describe the anticipated benefits of the Companies' Future of Heat strategy.**

A. The Companies' multi-faceted approach empowers customers to make energy choices that further clean energy goals, while also establishing the Companies as key drivers of the energy transition through development and deployment of RNG and a suite of NPA technologies. Collectively, the Companies believe the solutions presented here will drive a positive change in how customers meet their energy requirements and have a beneficial impact on the environment with projected reductions in carbon dioxide ("$CO_2$") emissions of approximately 73,000 metric tons (equivalent to taking 15,000 cars off the road for one year).

**Q. What are the costs of the Companies' Future of Heat strategy?**

A. Altogether, the Companies' propose to invest a total of $89.788 million over four years in incremental Future of Heat initiatives to reduce carbon emissions on the gas network and empower customers in support of a cleaner, more sustainable energy future. These amounts were provided to the Revenue Requirements Panel to develop the revenue requirements for KEDNY and KEDLI in the Rate Year (the 12 months ending March 31, 2021) and Data Years (Data Year 1 is the 12 months ending March 31, 2022; Data Year 2 is the 12 months ending March 31, 2023; and Data Year 3 is the 12 months ending March 31, 2024) (collectively, the "Data Years). The projected non-labor operations and maintenance ("O&M") costs and related full-time equivalent ("FTE") employees for the Future of Heat initiatives are set forth in Exhibit ___ (FOH-13). The projected capital costs for the Future of Heat initiatives are set forth in Exhibit ___ (GIOP-1) and Exhibit ___ (GIOP-7).

**Q. Does the Panel sponsor any exhibits as part of its testimony?**

A. Yes. The Panel sponsors the following exhibits that were prepared and compiled under our direction and supervision:

(i) Exhibit ___(FOH-1) are data sheets with summaries of the Companies' significant customer products, programs, and demonstration project proposals;

(ii) Exhibit ___ (FOH-2) are Benefit-Cost Analyses ("BCAs");

(iii) Exhibit ___ (FOH-3) is the Gas Demand Response REV Demonstration Project Quarterly Report for the Fourth Quarter of 2018, ending December 31, 2018;

(iv) Exhibit ___ (FOH-4) is the Geothermal Demonstration Project Quarterly Report for the Fourth Quarter of 2018, ending December 31, 2018;

(v) Exhibit ___ (FOH-5) is a Newtown Creek Project data sheet;

(vi) Exhibit ___ (FOH-6) is the Power-to-Gas ("P2G") Demonstration Project ("P2G Project") data sheet;

(vii) Exhibit ___ (FOH-7) provides detailed program descriptions including proposed modifications to KEDNY and KEDLI's current economic development grant programs;

(viii) Exhibit ___ (FOH-8) is the cost forecast of KEDNY and KEDLI's proposed economic development grant programs;

(ix) Exhibit ___ (FOH-9) is an example of the E-Commerce Platform PSR calculation;

(x) Exhibit ___ (FOH-10) is a summary of the proposed EAMs;

(xi) Exhibit ___ (FOH-11) describes the NPA Incentive Mechanism;

(xii) Exhibit ___ (FOH-12) describes the EmPower Replacement Earnings Incentive Mechanism; and

(xiii) Exhibit ___ (FOH-13) is a summary of labor and non-labor O&M expenses for the Future of Heat initiatives.

## III. Reducing Methane Emissions

**Q. What is methane and why are the Companies focused on reducing emissions?**

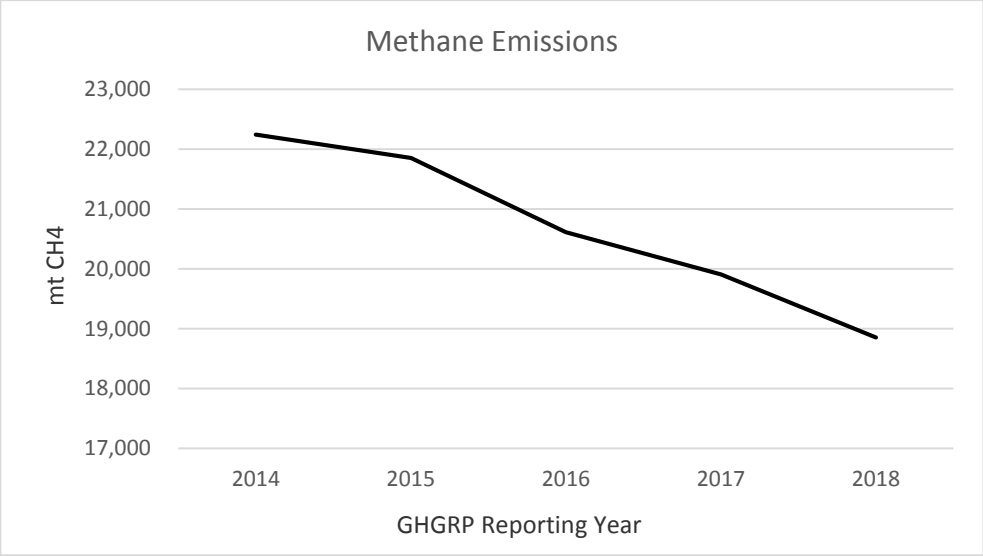
A. Methane ($CH_4$), the primary component of natural gas, has been identified by the U.S. Environmental Protection Agency ("EPA") as a greenhouse gas. The Companies, as distributors of natural gas, are committed to taking actions that reduce methane emissions from the gas network, ensuring that gas deliveries are sustainable and consistent with the Companies' clean energy goals.

**Q. What steps have the Companies taken to address methane emissions?**

A. The most cost-effective means of reducing methane emissions is to eliminate system leaks through the replacement of aging infrastructure. As shown in Figure 1 below, between 2014 and 2018, the Companies

replaced approximately 733 miles of leak-prone pipe ("LPP"), preventing approximately 3,388 metric tons of methane emissions each year.[1]

**Figure 1: Methane Emission Reductions**




In addition to infrastructure upgrades, the Companies have implemented work practices and procedures to mitigate methane emissions released during construction and maintenance activities. As discussed more below, in May 2016, the Companies established a blowdown protocol that limits methane emissions when purging gas from a pipeline – which can otherwise significantly contribute to total system emissions.

**Q. How do the Companies plan to build on these efforts?**

[1] Emission reduction estimates are based on the calculation methodology set forth in the Environmental Protection Agency's ("EPA") regulations (40 C.F.R. § 98, Subpart W).

A. The Companies are building on their initial success by deploying a multi-faceted strategy aimed at achieving meaningful methane reductions, including a proposal to increase the pace and scale of LPP replacement in NYC, identifying and repairing the highest emitting leaks, deploying a new mobile methane detection program, and continued utilization of blowdown reduction procedures.

### A. Commitment to Methane Reduction Policies

**Q. Please describe the Companies' efforts to lead the policy discussion on reducing methane emissions.**

A. To drive a positive step change in natural gas production and distribution, the Companies have taken a series of policy actions aimed at reducing methane emissions. First, the Companies are establishing an ambitious target to reduce methane emissions from the gas distribution system 60 percent (from 1990 levels) by 2035. Second, as part of the EPA's Methane Challenge Program's ONE Future Emissions Intensity Commitment Option, the Companies are working to reduce the methane leakage rate from the production, processing, transmission, and distribution of natural gas to one percent or less by 2025. Collectively, these policy initiatives are driving transparency and accountability for

reducing methane emissions across all segments of the natural gas value chain.

### B. Leak-Prone Pipe Replacement and Leak Reduction Programs

**Q. Please describe the Companies' LPP replacement efforts.**

A. The direct testimony of KEDNY and KEDLI's Gas Infrastructure and Operations Panels ("GIOP") highlight the Companies' continuing commitment to replacing older, high-risk LPP, which disproportionately contributes to leaks on the Companies' systems. The EPA, as part of its Methane Challenge Program, identified this strategy – upgrading natural gas infrastructure – as a best management practice for reducing methane emissions; noting that it also mitigates operational risks, increases efficiency, and advances environmental goals.

To that end, the Companies propose to continue their aggressive proactive LPP replacement efforts, increasing the replacement miles to 225 per year for a total of 930 miles over four years. Altogether, the Companies anticipate these efforts, once complete, will result in greenhouse gas reductions of approximately 3,627 metric tons of methane each year.

**Q. What are the Companies' commitments to reducing system leaks?**

A. Over the last several years, the Companies have eliminated thousands of leaks from their backlogs of non-hazardous leaks, which has driven further reductions in overall methane emissions. Each year, KEDNY and KEDLI eliminate more than 150 and 750 system leaks, respectively, through a combination of main/service replacements and proactive leak repairs. The Companies are additionally incentivized to repair up to 250 incremental Type 3 leaks that have been ranked as high emitters - and these incentive targets were achieved in 2017 and 2018. In this case, the Companies are proposing to maintain aggressive leak reductions targets that would reduce the Companies' total system leaks by at least 900 leaks each year, as well as retain the current incentive to repair the highest emitting system leaks. These leak reduction targets are discussed in more detail by the Companies' Gas Safety Panel.

### C. <u>Mobile Methane Detection Program</u>

**Q. What is mobile methane detection?**

A. Mobile methane detection uses sensors (*e.g.,* cavity ring-down spectroscopy) attached to a vehicle equipped with mapping technology. This technology has the potential to quickly and efficiently identify large-volume natural gas leaks. With this information, utilities can target

infrastructure repairs and upgrades in high-priority areas with significant leaks.

**Q. Please describe the Companies' mobile methane detection efforts.**

A. The Companies, in partnership with Google, the Environmental Defense Fund, and Colorado State University, have been evaluating the potential use of an enhanced high-emitter methane detection vehicle, also referred to as the "Google Vehicle," to help with leak identification and prioritization. As set forth in the direct testimony of KEDNY and KEDLI's Gas Safety Panel, the Companies are proposing a program to expand the use of this technology in high-leak concentration areas. The technology could prove useful in monitoring, mapping, and helping the Companies to quickly and cost-effectively evaluate leak size and volume. With that information, the Companies can, in turn, prioritize repair and replacement activities in areas that can achieve the greatest methane emission reductions. Importantly, this effort is focused on identifying environmentally significant leaks, and as such it will augment, not replace, the Companies traditional leak surveying methods of identifying leaks.

**D. Blowdown Procedures**

**Q. What are blowdown procedures and how do they help reduce methane emissions?**

A. Natural gas distributors use blowdown mitigation procedures to bleed down and evacuate natural gas from an isolated pipeline or vessel and then re-inject the gas into the distribution system instead of letting it escape into the atmosphere. With the isolated pipeline free of gas, the pipeline owner or operator can then safely commence construction and repair activities. The EPA's Methane Challenge Program, through its Natural Gas STAR Program, identified the injection of blowdown gas into low-pressure mains as a best management practice for reducing methane emissions.

**Q. Please describe the Companies' blowdown procedures.**

A. In May 2016, National Grid adopted procedures for "Drawdown Compressor to Bleed Down Evacuate and Re-Inject Natural Gas from an Isolated Pipeline." The Companies use the procedures to minimize methane emissions when performing work in furtherance of their Methane Challenge Program commitments and clean energy priorities. In 2018, the Companies estimate the blowdown procedures reduced methane emissions by 156.442 million cubic feet (mcf).

## IV. Customer Empowerment and Enablement

**Q. What role do customers play in the Companies' vision for the future of heat?**

A. Customers are at the heart of the Companies' commitment to adapting the gas system to meet new demands with a cleaner product and drive future benefits, while continuing to deliver safe, affordable, and reliable service. In practice, this means seamlessly enhancing the customer experience by: empowering them to take control of their energy usage through robust energy efficiency offerings; advancing new products and services that allow customers to actively participate in achieving clean energy goals; and enabling new customers to sustainably meet their heating needs.

### A. Energy Efficiency

**Q. Please describe the Companies' current energy efficiency programs.**

A. The Companies' energy efficiency programs consist of a portfolio of programs designed to achieve energy savings across various market sectors (*e.g.,* residential, small business, and commercial and industrial ("C&I")). A description of the portfolio for program years 2019 and 2020 is set forth in the Companies' Updated 2019-2020 ETIPs, filed with the Commission on February 19, 2019 in Cases 15-M-0252 and 18-M-0084.

Over the past ten years, KEDLI's energy efficiency programs processed over 407,000 applications and helped customers save approximately 16.5 million therms. Over the same period, KEDNY's energy efficiency programs processed more than 490,000 applications and helped customers save approximately 23.1 million therms.

**Q. How do the Companies recover energy efficiency program costs?**

A. Energy efficiency program costs are currently recovered through the System Benefits Charge ("SBC") outside of base rates, except for labor and associated overhead costs, which were transitioned to base rates in the 2016 KEDNY and KEDLI Rate Cases. As set forth in the Companies' 2019 ETIP filings, the current annual budgets, excluding low-income budgets, for KEDNY and KEDLI's energy efficiency programs are as follows:

**Table 1 - Energy Efficiency Program Costs**
**($000s)**

| Year | KEDNY | KEDLI |
|---|---|---|
| 2019 | $15,118 | $8,137 |
| 2020 | $16,877 | $8,866 |

**Q. How are energy efficiency program budgets determined?**

A. Utility-specific targets and budgets for calendar years ("CY") 2019 and 2020 were adopted by the Commission in the December 2018 EE Order. Program targets and budgets for the years 2021-2025 are currently being reviewed in Case 18-M-0084. The Commission established "presumptive targets and budgets" in the December 2018 EE Order as a starting point for the development of utilities' specific portfolio proposals. Until the Commission directs otherwise, the Companies are using the adopted budget amounts for CY 2020, along with the presumptive targets and budgets for CYs 2021-2025 set forth in Appendix C of the order, to determine the proposed budget amounts for the Rate Year and Data Years.

**Q. Are the Companies proposing any changes to the manner in which energy efficiency program costs are recovered?**

A. Yes, the Companies are proposing three changes, two of which impact the revenue requirements in the Rate Years and Data Years. First, the Companies propose to move evaluation, measurement, and verification ("EM&V") administrative costs from the ETIP portfolio budget into base rates. Second, the Companies propose to maintain the current ETIP portfolio budget levels, inclusive of the amount removed for EM&V. This approach is consistent with the Commission's Order in Cases 17-E-0238

and 17-G-0239 (the "2017 NMPC Rate Case"), and it will enable the Companies to fund additional customer programs. Third, the Companies propose to move all energy efficiency costs from the SBC into base rates. Moving energy efficiency costs to base rates is also consistent with the approach adopted by the Commission in the 2017 NMPC Rate Case.

**Q. What are EM&V activities?**

A. These are activities to evaluate, measure, verify, track, and report energy efficiency savings. The current annual budget for KEDLI's EM&V activities was set at five percent of the annual ETIP portfolio budget, $0.408 million in 2019 and $0.445 million in 2020, as set forth in KEDLI's ETIP. The current annual budget for KEDNY's EM&V activities was also set at five percent of the annual ETIP portfolio budget, $0.785 million in 2019 and $0.876 million in 2020, as set forth in KEDNY's ETIP.

**Q. Please explain why the Companies are proposing to move the costs associated with EM&V activities from the SBC surcharge to base rates, beginning in the Rate Year.**

A. The Companies' proposal aligns with the Commission's direction in the REV Track One Order to begin transitioning energy efficiency costs into

base rates. The costs proposed to be moved are administrative costs associated with EM&V activities. These costs are either not directly related to delivery of the energy efficiency portfolio contained in the ETIPs or are scoped to integrate initiatives beyond energy efficiency only. The proposal is also consistent with the treatment recently approved by the Commission in the 2017 NMPC Rate Case Order. Tables 2a and 2b show the annual costs the Companies propose to shift from the ETIPs to base rates in the Rate Year and Data Years.

**Table 2a – KEDLI Costs Shifted from ETIP to Base Rates**

| Costs Shifted from the ETIP | CY 2020 Budget Amounts | FY 2021 Rate Year | FY 2022 Data Year 1 | FY 2023 Data Year 2 | FY 2024 Data Year 3 |
|---|---|---|---|---|---|
| EM&V | $444,977 | $473,898 | $513,426 | $563,054 | $629,575 |

**Table 2b – KEDNY Costs Shifted from ETIP to Base Rates**

| Costs Shifted from the ETIP | CY 2020 Budget Amounts | FY 2021 Rate Year | FY 2022 Data Year 1 | FY 2023 Data Year 2 | FY 2024 Data Year 3 |
|---|---|---|---|---|---|
| EM&V | $876,207 | $924,353 | $1,038,023 | $1,169,814 | $1,395,742 |

The adjustment to move budgeted EM&V costs to base rates is shown in Exhibit ___ (RRP-3), Schedule 27, page 6.

**Q. Please explain the Companies' proposal to maintain the ETIPs at their current 2019-2020 budgets.**

A. In the December 2018 EE Order, the Commission established increased utility energy efficiency budgets and targets to help achieve the State's carbon reduction goals. The Companies believe the level of energy efficiency funding adopted in the December 2018 EE Order, which is currently reflected in the Companies ETIP, should be maintained.

The Companies are proposing to maintain the current annual ETIP budgets through 2020. Furthermore, with the previously described movement of EM&V costs to base rates, the Companies propose to add additional programs and initiatives to the ETIP portfolios that would backfill the ETIP budgets and keep overall ETIPs at the same amount. The new incremental programs and initiatives will enable achievement of additional energy savings that are reflected in the higher savings targets approved in the December 2018 EE Order. For purposes of the revenue requirement in this filing, the Companies modeled the energy efficiency revenues and expenses and proposed budgets to align with the December 2018 EE

Order. KEDNY's ETIP budget moving to base rates is $18.102 million for the Rate Year, $20.464 million for Data Year 1, $23.128 million for Data Year 2, and $27.551 million for Data Year 3. KEDLI's ETIP budget moving to base rates is $9.478 million for the Rate Year, $10.274 million for Data Year 1, $11.269 million for Data Year 2, and $12.592 million for Data Year 3.

**Q. Please explain the Companies' proposal to transition energy efficiency program costs from the SBC surcharge to base rates.**

A. Consistent with the Companies' understanding of Staff and the Commission's expectations, the Companies propose to transition the entire ETIP program costs to base rates beginning in the Rate Year. The Companies further propose to reconcile, over the term of the rate plan, actual ETIP costs to the amount included in rates. Any under expenditure in a given year will be carried forward and reconciled at the end of Data Year 3. If there is an underspend at that time, the Company will defer the difference for future refund to customers.

**Q. Are the Companies forecasting the need for additional resources to manage the energy efficiency portfolio?**

A. Yes. In the December 2018 EE Order, the Commission proposed increases to the existing approved portfolios. Given the size of the Companies current programs and anticipated future program growth, the Companies forecast the need for seven incremental FTEs to support portfolio design development and implementation. The Companies propose to include four program manager roles focused on product development and delivery to the customers through third-party vendors and direct sales. In addition to these roles, the Companies propose to add one FTE supporting the sales activities for delivery of C&I products and two FTEs providing technical sales support.

**Q. What are the proposed FTE costs?**

A. As shown in Exhibit__ (RRP-3) Schedule 27, forecast O&M costs for the FTEs are as follows:

**Table 3 - FTE Costs**
**($000s)**

| | KEDNY | KEDLI |
|---|---|---|
| Rate Year | $534 | $552 |
| Data Year 1 | $545 | $564 |
| Data Year 2 | $561 | $581 |
| Data Year 3 | $570 | $589 |

**Q. Does KEDLI plan to continue the EmPower Replacement Program (known as "HEAT")?**

A. Yes. In the 2016 KEDNY and KEDLI Rate Cases, the Commission approved KEDLI's low-income energy efficiency HEAT Program, which is currently funded through KEDLI's existing Low-Income Discount Program deferral balance. In CY 2017, the program was capped at $1.9 million, and in CYs 2018 and 2019 the cap was adjusted for inflation. KEDLI's administrative costs for the program were limited to no more than 15 percent of the annual budget amount. The HEAT Program also included an incentive mechanism, which, as set forth in the performance-based incentive section below, KEDLI proposes to continue.

KEDLI proposes to continue the program as designed but include the HEAT program costs in base rates. In addition, KEDLI proposes to increase the budget from $1.9 million to $2.5 million annually. KEDLI will use the additional funding to expand the offering to "moderate-income" customers, defined as those between 60 percent and 80 percent of state or area median income, whichever is higher. This program will assist in filling a gap that exists on Long Island for moderate income gas customers without electric air conditioning in the absence of a New York

State Energy Research and Development Authority ("NYSERDA") sponsored program.

**B. New Products and Services**

**Q. Please describe the Companies' proposals for new customer products and services.**

A. The Companies are committed to empowering and enabling customers to take more control over their energy usage, reduce consumption, and proactively embrace products and services that align with the State's clean energy goals. To that end, the Companies are proposing the following products and services as a means of providing customers with new options they can use to optimize energy usage and reduce their environmental impact:

(i) Green Gas Tariff;

(ii) Utility Energy Services Contracts ("UESC");

(iii) Fuel-Switching Calculator; and

(iv) Natural Gas Vehicle ("NGV") Rates.

Each product and service is supported by a detailed data sheet attached here to as Exhibit ___(FOH-1), summarizing the Companies' proposals, as well as the benefits of the proposed investments.

### 1. *Green Gas Tariff Offering*

**Q. Please describe the Companies' proposed Green Gas Tariff offering.**

A. As set forth in Exhibit ___ (FOH-1), Schedule 1, the Companies propose a Green Gas Tariff offering beginning in Data Year 1 that will enable customers to voluntarily purchase RNG to meet all or a portion of their energy needs. The offering will include four tiers, allowing customers to select a level of green gas procurement that works for their budget and their environmental aspirations.

**Q. What Green Gas Tariff tiers will the Companies offer?**

A. The Companies recognize that different customers prefer different pricing structures, residential customers tend to prefer price certainty, while non-residential customers tend to prefer costs that scale as a percentage of use. To accommodate these differing customer preferences, the Companies propose a tiered structure as follows

| Tier | Residential Flat Rate | Non-Residential | |
|---|---|---|---|
| | | % of Monthly Consumption | Flat Rate |
| Low | $5/month | 5% | $25/month |
| Low-Middle | $20/month | 10% | $50/month |
| High-Middle | $25/month | 25% | $100/month |
| High | $50/month | 100% | $200/month |
| | | | $500/month |

Residential customers would be required to commit to the Green Gas Tariff program for twelve months, while non-residential customers must commit to a twenty-four-month term for either the flat rate or percentage of monthly consumption option.

**Q. How do the Companies propose to address any potential over collection or under collection RNG gas costs for the Green Gas Tariff offering?**

A. As further discussed in the direct testimony of the Companies' respective Rate Design Panels, the Companies propose a RNG-specific cost of gas to maintain an accurate cost of RNG apart from the cost for traditional gas. To the extent the Companies monetize the environmental attributes of excess gas, such amounts would reduce RNG costs for participating Green Gas Tariff customers.

**Q. What is the cost of the Green Gas Tariff offering?**

A. As set forth in Exhibit ___ (FOH-13), the Companies propose two FTEs to implement the new offering. The FTEs will be responsible for: contracting with RNG suppliers; tracking quantities of green gas purchased and sold monthly; managing the balance between purchases and sales; acquiring environmental attributes (to the extent sales exceed purchases); selling environmental attributes (to the extent purchases exceed sales); tracking green gas costs and revenues; making all associated transaction system entries; and performing reporting requirements. For KEDNY, the labor-related costs include $0.157 million in Data Year 1, $0.162 million in Data Year 2, and $0.164 million in Data Year 3. For KEDLI, the costs include $0.163 million in Data Year 1, $0.167 million in Data Year 2, and $0.170 million in Data Year 3.

**Q. What are the benefits associated with the proposed Green Gas Tariff offering?**

A. Offering a Green Gas Tariff to customers means they will have the opportunity to purchase a renewable fuel without the need to modify their existing equipment. Because RNG is made up of the same constituents as fossil-based natural gas, it can be introduced into the gas

distribution network safely and utilized by existing natural gas-fired equipment. This allows customers to reduce the environmental impact of their heating, without the need to replace appliances. Adoption by customers will also help advance the RNG market by providing predictable demand and certainty to RNG developers looking to invest in RNG projects. Additionally, customers who operate NGVs can purchase RNG for their fleet, helping decarbonize transportation (the sector with the largest volume of carbon emissions in the State). Finally, the Green Gas Tariff directly supports clean energy policy objectives, including: achieving a 40 percent reduction in greenhouse gas emissions by 2030; National Grid's 80x50 Pathway; cleaner transportation; protecting New York's natural resources by diverting waste streams and reducing organics in the water system; and building a more resilient energy system.

### 2. *Utility Energy Services Contracts ("UESC") Program*

**Q. What is the UESC program?**

A. The UESC program is an energy services contracting program, where the Companies and customers, typically government agencies and other large commercial entities, enter limited-source contracts for energy management services, such as energy and water improvements. With a

UESC, the Companies can help customers analyze their current energy usage, identify opportunities for improvement, and work with pre-selected contractors to achieve efficiencies, reduce costs, and adopt renewable energy systems, provided the efficiencies include some measure of gas savings. The customers, in turn, pay for the contracted services for the improvements delivered under the UESC. As further set forth in Exhibit ___ (FOH-1), Schedule 2, the Companies and their New York affiliates have participated in UESCs since 2011, delivering more than $18 million in value.

**Q. Are the Companies proposing any changes to the UESC program?**

A. Yes. The Companies propose an incentive to help customers offset the cost of energy feasibility studies, as well as the inclusion of a marketing budget to engage new customers. The Companies also propose a PSR for fees received from entities who enter a UESC with either of the Companies to implement the feasibility study findings. The PSR proposal is set forth in the Performance-Based Incentives and Revenue Sharing Section below.

**Q. Please describe the proposed energy feasibility study incentive.**

A. Feasibility studies are often the first step in the UESC process, providing customers with a range of improvements that could help better manage their energy usage and the potential cost savings associated with implementing the study's findings. The studies, however, can be expensive, with upfront costs deterring customers from initiating the UESC process. To overcome this hurdle, and only in so far as such costs are not covered by another program or entity like NYSERSDA, the Companies propose an incentive equivalent to 50 percent of any feasibility study that exceeds $0.010 million.

**Q. Please describe the Companies' proposed increase in program marketing?**

A. The Companies propose to create a marketing budget for the program and add two FTEs. The marketing increase includes outreach (*e.g.*, customer leads), sales, and procurement. The FTEs will include a marketing manager to drive additional customer participation in the program and a project engineer to assist customers through the energy feasibility study and implementation process.

**Q. Please summarize the costs included in the revenue requirements for the UESC program?**

A. The revenue requirement, as shown in Exhibit ___ (FOH-13), includes incremental O&M for marketing, feasibility study incentives, and FTEs. For KEDNY the revenue requirement includes $0.257 million in the Rate Year, $0.455 million in Data Year 1, $0.596 million in Data Year 2, and $0.688 million in Data Year 3. For KEDLI, the revenue requirement includes $0.261 million in the Rate Year, $0.459 million in Data Year 1, $0.600 million in Data Year 2 and $0.692 million in Data Year 3.

**Q. What are the benefits of the UESC program?**

A. UESCs allow government agencies and large commercial customers to benefit from the Companies' energy expertise, creating a streamlined approach to contracting using a limited-source contract vehicle that meets public procurement process requirements. With the energy savings achieved through the UESC program, customers will further benefit by saving money and achieving clean energy goals and mandates. For the Companies, UESCs provide an opportunity to enhance customer relationships while driving energy policy objectives. By becoming a partner in better energy management, the Companies can improve

customer load profiles, advance customer and State clean energy goals, and help to alleviate system constraints.

### 3. *Fuel-Switching Calculator*

**Q. Please describe the Companies' proposed fuel-switching calculator.**

A. The Companies propose to develop a web-based fuel-switching calculator similar to one developed by Central Hudson Gas and Electric Company. Using current costs, desired heating technology (*e.g.,* natural gas, ground or air sourced heat pumps), and existing equipment, the calculator can provide customers an estimated annual cost, payback period, and savings for alternative energy options as compared to their current load profile. Additionally, the calculator will highlight low-carbon fuel offerings, such as RNG available through the Companies' Green Gas Tariff offering, to allow users further clean-energy comparisons. A more detailed description of the proposed calculator is included in Exhibit ___ (FOH-1), Schedule 3.

**Q. What is the cost of the fuel-switching calculator?**

A. As shown in Exhibit ___ (FOH-13), the fuel-switching calculator proposal includes incremental O&M expense for the development and operation of the calculator of $0.125 million for KEDNY and KEDLI in

the Rate Year, and $0.018 million for the Companies in each of the Data Years.

**Q. What are the benefits associated with the proposed fuel-switching calculator?**

A. The fuel-switching calculator will empower customers to make more informed energy choices, providing them with information to assess the financial impacts of alternative energy options. The Companies believe that through such energy insights, customers will discover how they can use low-carbon solutions (*e.g.*, RNG, geothermal) at a reasonable cost. This, in turn, may animate the market for low-carbon products and services, leading to increased adoption and lowering emissions in support of the State's clean energy goals and the REV objectives.

### 4. *Natural Gas Vehicle ("NGV") Rates*

**Q. Please describe the Companies' proposed adjustment to NGV Rates.**

A. The Companies propose modernizing the NGV rates currently contained in their respective tariffs to ensure the rates are appropriate under current market conditions and designed to incentivize the use of RNG in the transportation sector – the sector that is the largest source of greenhouse gas emissions in the State. The specific changes include updates to

conventional rates, as set forth in the respective direct testimonies of the Rate Design Panels and establishing firm and non-firm (full or partial interruptible) service. Additional details regarding the Companies' proposal are set forth in Exhibit ___ (FOH-1), Schedule 4.

**Q. What rates do the Companies propose?**

A. The proposed rates for KEDNY and KEDLI are supported by the Rate Design Panels. The Companies further propose to monitor the market and, if the market conditions warrant, the Companies will petition the Commission to adjust the rates.

**Q. What are the benefits of updating NGV rates?**

A. Updating NGV rates will support increased use of NGVs in the heavy-duty transportation sector, lowering emissions as compared to diesel vehicles. The Companies believe this adjustment will animate the market for NGVs, leading to their increased use as a lower-carbon transportation resource. Displacing diesel plays an important role in achieving the State's clean energy goals through the decarbonization of the transportation sector. Additionally, by introducing an interruptible service offering, the Companies add to their suite of NPAs, potentially

reducing system peaks, alleviating constraints, and delaying traditional infrastructure investments.

### C. Demand Response

**Q. What role does demand response play in the Companies' future of heat strategy?**

A. Demand response has the potential to play an important role in the Companies' future of heat strategy. Accordingly, the Companies are promoting demand response in two ways. First, the Companies' IT/TC service is one of the largest gas demand response programs in the country. Among other things, IT/TC service enables the Companies to reduce gas demand during periods of peak usage by offering a reduced delivery rate to customers who agree to interrupt service when demand peaks. The program benefits all customers by allowing the Companies to utilize the gas system more efficiently while avoiding the need for costly capital upgrades to meet a higher peak demand. Following a collaborative with Staff and interested parties, the Companies proposed to implement certain enhancements to the IT/TC offering. In the February 7, 2019 *Order Approving Tariff Revisions and Directing Further Tariff Filings* in Cases 16-G-0058 and 16-G-0059 ("IT/TC Order"), the Commission adopted these changes, which will blend the

existing IT and TC services into a single non-firm service classification with two pricing tiers determined by a customer's fuel switching capabilities. The testimony of KEDNY and KEDLI's Rate Design Panels discuss the proposed enhancements to IT/TC services.

Second, to complement the IT/TC program, the Companies' propose to expand the existing Demand Response Demonstration Project for firm customers who commit to minimum reductions. Expanding the project will allow the Companies to better determine whether they can achieve system benefits through peak demand reductions. Taken together, the non-firm and firm demand response programs have potential as components of the Companies' suite of NPA planning tools.

**Q. Please describe the Gas Demand Response Program adopted by the Commission in the 2016 KEDNY and KEDLI Rate Cases.**

A. Under the Gas Demand Response Program, the Companies provide a market-based credit to commercial firm customers who reduce their gas usage by a pre-determined amount when called upon by either company to do so. The initial purpose of the Demand Response Demonstration Project was to assess the effectiveness of voluntary peak reductions in

terms of reducing intraday demand and whether market-based credits will drive customer behavior to reduce consumption.

**Q. What results have the Companies seen thus far?**

A. In the project's first year, the Companies collectively called five events (two were exclusive to KEDLI customers), with 100 percent of the 16 project enrollees participating. During events in which both KEDNY and KEDLI customers participated, they collectively contributed a reduction of 192 dekatherm ("Dth") per hour of nameplate capacity (135 Dth in KEDNY, 57 Dth in KEDLI) during the peak hour. Such a reduction alleviates the burden on the system, and, with sufficient assurances, could be considered a system-management tool in the future. As part of the demonstration, the Companies provided $0.303 million in incentive payments to customers.

For the current year, only one customer has withdrawn from the project for operational reasons and a large property management company, Estates NY Real Estate Services LLC ("Estates"), has shown considerable interest in participating, submitting multiple applications for different facilities. The Companies were able to incorporate one of the facilities into the project – creating further opportunities for collaboration

and learning as discussed by the Commission in the IT/TC Order. During the second year, the Companies collectively called five events (two were exclusive to KEDLI customers). Customer participation across all events was 94 percent. In the events with 100 percent participation, customers provided 241 Dth per hour of nameplate capacity (184 Dth in KEDNY and 57 Dth in KEDLI) during the peak hour. Further information on the Demand Response Demonstration Project is included in Exhibit ___(FOH-3).

**Q. Please describe the Companies' proposed expansion of the Demand Response Demonstration Project.**

A. The Companies propose to build off the initial success of the Demand Response Demonstration Project, expanding it in scale and continuing to market to firm gas delivery customers that meet minimum annual demand values and agree to a minimum reduction amount (Dth/event hour). The Companies will notify enrolled customers in advance of an event. Such customers will then receive an incentive for reducing their gas demand by the pre-determined, minimum reduction value for the entire duration of a peak event.

Reductions in excess of the committed minimum will be incentivized at a prorated amount. The reduction will be determined based on a baseline that will be developed for each participating customer. To achieve the level of certainty needed for firm customer demand response to provide meaningful system benefits, the Companies propose to include a penalty that exceeds the incentive for customers who fail to respond or fail to meet the minimum committed reduction. Furthermore, customers who fail to respond or meet their committed reduction for more than a predetermined number of events may be removed from the project and prohibited from participating in future years. Further detail regarding the proposed expansion of the Demand Response Demonstration Project is included in Exhibit ___ (FOH-1), Schedule 5.

**Q. What are the benefits associated with the expanded Gas Demand Response Project?**

A. Gas demand response is a potentially valuable tool in the Companies' NPA toolbox. The project has already illustrated the capability to meaningfully decrease system pressure during peak periods. Customers have also proven willing to reduce their gas usage in response to financial incentives. Structural changes to the program, including the use of a baseline to determine reductions and increasing the scale of the

program to potentially interest the aggregator community, may make this program a viable way to reduce, delay, or eliminate infrastructure investment, especially when used in conjunction with other NPA technologies. In addition to supporting system pressure, gas demand response has the potential to reduce the quantity of supply that may be required on a peak day, which can provide cost savings. In addition, throughout the demonstration project, customers have been given access to their usage data, providing them insights that they previously have not had about their gas use. Such insights may encourage greater participation in the Companies' energy efficiency programs and help to achieve the REV objective of empowering customers to make more informed energy choices.

**Q. What are the minimum values the Companies propose for customer eligibility and reduction targets?**

A. For KEDNY, eligible customers must consume at least 6,000 Dth per year and commit to reducing demand over the duration of a peak event by at least two Dth per hour (*i.e.*, six Dth over the three-hour demand response event). For KEDLI, eligible customers must consume at least 4,000 Dth per year and commit to reducing demand over the duration of

an event by at least two Dth per hour (*i.e.*, six Dth over the three-hour demand response event).

Customers will specify their committed reduction amount during the application process. The committed reduction must be greater than 10 percent of either the customer's usage during a peak period or the sum of the nameplate requirements of the customer, whichever is less. This can be determined based on either data from the Companies or data from customer measurement systems. Customers must achieve the minimum reduction in each of the three hours of the event. Reducing peak usage more than the minimum may occur in any of the three hours.

**Q. What are the costs of the expanded Gas Demand Response Demonstration Project?**

A. As shown in Exhibit ___ (GIOP-7), the costs of the project for KEDNY include a capital investment of $0.236 million in FY 2020 and $0.059 million in each of the Rate Year and Data Years 1 and 2. For KEDLI, the costs of the project include a capital investment of $0.107 million in FY 2020 and $0.027 million in each of the Rate Year and Data Years 1 and 2.

In addition, the project includes incremental O&M expense to cover the cost of the incentives, demand response software fees, and FTEs to administer the project. As shown in Exhibit ___ (FOH-13), Schedule 1, the revenue requirement includes incremental O&M costs for KEDNY of $1.320 million in the Rate Year, $1.638 million in Data Year 1, $1.962 million in Data Year 2, and $2.326 million in Data Year 3. For KEDLI, the revenue requirement includes incremental O&M costs of $0.628 million in the Rate Year, $0.772 million in Data Year 1, $0.921 million in Data Year 2, and $1.112 million in Data Year 3, as shown in Exhibit ___ (FOH-13), Schedule 2. The costs include the addition of one FTE in the Rate Year and Data Year 1 split between the Companies and the addition of two FTEs in Data Year 2 and Data Year 3 split between the Companies. The FTEs will manage the project, by signing up customers and aggregators, evaluating data, coordinating with the gas operations group, and responding to regulatory inquiries and filing requirements.

**Q. Will the Companies continue to report the findings from the Demand Response Demonstration Project?**

A. Yes, the Companies will continue to submit quarterly report updates regarding the expanded Gas Demand Response Demonstration Project.

## D. Sustainable Heat Initiative

**Q. Please describe the Companies' Sustainable Heat Initiative.**

A. The Companies propose a Sustainable Heat Initiative to ensure customers have an opportunity to participate in the clean-energy future through access to lower-carbon heating technology, while at the same time supporting the efficient operation of the natural gas network. The initiative includes three components. First, the Companies propose to draw on the lessons learned from KEDLI's current geothermal demonstration project, by expanding the offering to interested customers, giving priority to those located outside the footprint of the current and planned gas networks. This effort will help customers determine whether geothermal technology may be a suitable NPA for meeting heating requirements and facilitate customer access and adoption of geothermal systems.

Second, customers for whom geothermal is not the preferred option would have the ability to participate in the Companies' Clean Conversion Program – a scaled-down version of the former Neighborhood Expansion Program – intended to address anticipated customer demand for access to gas heating, as opposed to higher emitting (and costlier) heating options such as oil. Third, for those customers facing economic barriers to

adopting lower-carbon heating technology, the Companies propose expanding the Low-to-Moderate Income Gas Conversion Program ("LMI Gas Conversion Program") to provide incentives that will help customers access cleaner, more efficient heating options.

**Q. How will the Sustainable Heat Initiative benefit customers?**

A. To meet the 80x50 goal and transition to a cleaner energy future, the Companies believe aggressive action is required by both the Companies and their customers. In some cases, however, customers have few options for meeting their heating requirements based on practical challenges (*e.g.*, proximity to clean energy sources) and economic barriers (*e.g.*, high upfront costs). The Companies propose this initiative as a comprehensive approach to meeting customer demand in a clean and sustainable way. It combines a robust NPA offering (*i.e.,* geothermal) with gas conversions and incentives, as a means of giving customers additional clean-energy choices. Taken together, the Companies believe the initiative will achieve meaningful reductions in greenhouse gas emissions.

### 1. *Expanded Geothermal Demonstration Project*

**Q. Please describe KEDLI's current Geothermal Demonstration Project.**

A. The Geothermal Demonstration Project for KEDLI was adopted in the 2016 KEDNY and KEDLI Rate Cases to test shared-loop ground-source heat pump ("GSHP") systems as a cost-effective heating and cooling alternative to natural gas infrastructure in the Glenwood Village community of Riverhead, New York. The community is not currently served by KEDLI's gas network. The geothermal technology used in the project offers a way to reduce the carbon intensity of the heating and cooling sector while providing homeowners with potentially significant energy cost savings.

**Q. What results has KEDLI seen thus far from the project?**

A. In the first year of the project, KEDLI connected a total of ten homes with shared-loop GSHP systems, representing a total system heating capacity of 30 tons. The systems performed well during a period of extended cold weather in January 2018, with customers not reporting any loss in comfort. Likewise, during prolonged periods of warm weather in the summer, the systems did not encounter any interruptions or service outages.

The systems used in the demonstration project have also achieved high coefficients of performance ("COP") in the range of 2.2 to 3.5. High COPs, such as those realized in the Glenwood Village community, are a hallmark of GSHP, which leverages stable ground temperatures. With continued customer education and coordinated energy efficiency, the project results suggest GSHPs have the potential to achieve COPs up to 4.

Finally, customers identified comfort-related benefits, including improved air quality, quiet equipment operation, simplicity, and more even distribution of hot and cold air. Further information from the first year of the Geothermal Demonstration Project is included in Exhibit ___(FOH-4).

**Q. Why are the Companies seeking to expand the Geothermal Demonstration Project?**

A. Based on the project's initial success, the Companies believe geothermal technology has the potential to play an important role in the suite of NPAs called upon to sustainably meet customer heating requirements. The Companies estimate that approximately 200,000 residential buildings are more than 200 feet from the Companies' gas distribution

system and are therefore prospects for an alternative heating solution. By facilitating the installation of geothermal installations in areas of new construction (*i.e.*, areas where the existing gas distribution system is unlikely to expand), as well as converting existing systems, the Companies can provide further customer, system, and environmental benefits.

The Companies also believe that expanding the Geothermal Demonstration Project, in partnership with geothermal installers and other stakeholders, is key to animating the geothermal market, driving further innovation, economies of scale, and reduced costs. The reduction of costs is critically important with the impending expiration of the federal investment tax credit, which currently supports the installation of GHSP systems.

The Companies estimate each geothermal customer could realize an average annual energy cost savings of between $1,000 and $1,500 and nearly 6.75 metric tons of $CO_2$ emission reductions from the displacement of approximately 800 gallons of heating oil. Finally, geothermal also supports several REV objectives, including greenhouse gas emission reductions in furtherance of the 80x50 goal, and aligns with

the Commission's goal of reducing energy use by five TBtu through the adoption of heat pumps.

**Q. How do the Companies propose to expand the Geothermal Demonstration Project?**

A. The Companies propose to own and install the ground-loop portion of GSHP system in parts of KEDNY and KEDLI's service territories. In return, geothermal customers would pay the respective company a fee for design work and company-owned equipment installed. The expanded project will prioritize LMI and C&I customers. The Companies expect the ground loop utility-ownership model will prove particularly useful, helping customers to spread costs over time and improving adoption rates.

The goal of the expanded Geothermal Demonstration Project is to help scale the market for this technology, reducing costs as economies of scale are achieved. The Companies would own the ground-loop portion of the GSHP systems and would partner with qualified installers, similar to the Companies' Value-Plus Installers list, that could complete the above-ground/in-home work for customers. In this way, the Companies would assist in the development of the geothermal market. Furthermore, the

Companies would seek to collaborate with industry stakeholders to develop and adopt best practices for installing GSHP ground loops, with specific consideration to how best to operate GSHP systems in an area that has a high saturation rate of natural gas infrastructure. The expanded project is supported by a detailed data sheet included as Exhibit ___(FOH-1), Schedule 6.

**Q. What is the cost of the expanded Geothermal Demonstration Project?**

A. As shown in Exhibit ___ (FOH-13), the expanded Geothermal Demonstration Project includes incremental O&M costs for the ground loops, marketing, and FTEs who will manage the portfolio of installations. For KEDNY, the projected O&M costs are $0.216 million in the Rate Year, $0.326 million in Data Year 1, $0.500 million in Data Year 2, and $0.63 million in Data Year 3. For KEDLI, the revenue requirement includes incremental O&M costs of $0.980 million in the Rate Year, $1.896 million in Data Year 1, $3.293 million in Data Year 2, and $4.287 million in Data Year 3, as reflected in Exhibit ___ (FOH-13), Schedule 2. The costs include the addition of one FTE in the Rate Year split between KEDNY and KEDLI, increasing to an additional two FTEs in Data Year 2 and Data Year 3 split between KEDNY and KEDLI. The

FTEs will manage the geothermal installations, coordinating RFPs, contacting project coordinators, and ensuring the increased electric load will not cause adverse impacts for the electric utility serving areas where the Companies have installed geothermal systems.

**Q. Do the Companies propose to reconcile the revenue requirement amount with the level of actual spending on the project?**

A. Yes, to the extent either of the Companies do not spend the rate allowance over the course of the rate plan, the underspend will be deferred for the benefit of customers.

**Q. How do the Companies propose to treat any fees received from customers participating in the project?**

A. The Companies intend to charge a fixed monthly fee to participating customers (approximately $440 per year), which will offset the cost of the engineering and design work, as well as the portion of the GSHP system owned by either KEDNY or KEDLI. The Companies believe this will be an important component of understanding customers' willingness to pay for this technology. The following forecast revenues for the expanded Geothermal Demonstration Project are included in the revenue

requirement, and offset project costs, as reflected in Exhibit ___ (FOH-13):

**Forecast of Expanded Geothermal Demonstration Project Revenues**

| | Project Participants | KEDNY | KEDLI |
|---|---|---|---|
| Rate Year | 75 | $3,300 | $29,700 |
| Data Year 1 | 150 | $9,900 | $89,100 |
| Data Year 2 | 275 | $22,000 | $198,000 |
| Data Year 3 | 400 | $39,600 | $356,400 |
| **Total** | **900** | **$74,800** | **$673,200** |

**Q. Will the Companies continue to report the findings from the expanded Geothermal Demonstration Project?**

A. Yes, the Companies will continue to submit quarterly report updates regarding the expanded project. If the project proves successful during the rate period, the Companies will petition the Commission for approval to scale the project and defer additional costs for recovery in the Companies' next rate case.

### 2. *Clean Conversion Program*

**Q. Please discuss KEDLI's Clean Conversions Program.**

A. As KEDLI transitions to a clean energy future, it must also fulfill its obligation to serve customers seeking to connect to the gas network. Often, such connections are preferred to the more carbon intensive,

costlier alternatives available. For this reason, KEDLI proposes a Clean Conversion Program, which will replace the existing Neighborhood Expansion Program. Under the Clean Conversion Program KEDLI will educate customers about their energy options using, among other things, the web-based fuel-switching calculator proposed in this case, as well as the RNG benefits available through the Green Gas Tariff offering. For customers whom geothermal or other NPAs are not the preferred option, KEDLI will offer them an opportunity to make an environmentally beneficial decision to convert their heating requirements from oil to natural gas through the Clean Conversion Program. Under the program, KEDLI will extend gas service to such customers under the same density and minimum customer connections requirements established in Case 14-G-0214.

**Q. What are the benefits of the Clean Conversion Program approach?**

A. The Clean Conversion Program benefits customers by giving them greater control over their energy options. In addition, by converting oil to natural gas, the Clean Conversion Program will enable KEDLI to take additional steps toward meeting the 80x50 target while also displacing significant quantities of heating oil.

**Q. What is the cost of the Clean Conversion Program?**

A KEDLI proposes $26 million in capital costs for the Clean Conversion Program in the Rate Year, $23 million in Data Year 1, $19 million in Data Year 2, and $16 million in Data Year 3. The costs are supported by the direct testimony of KEDLI's GIOP, as shown in Exhibit ___ (GIOP-1), Schedule 1.

### 3. *LMI Gas Conversion Program*

**Q. Please explain the Companies' LMI Gas Conversion Program.**

A. The Companies propose to replace the existing low-income gas conversion rebate program with the LMI Gas Conversion Program. The new program adds an important component to the Companies' Sustainable Heat Initiative by ensuring that LMI customers are not foreclosed, due to high upfront costs, from taking additional control over their energy usage. The program offerings will include products, such as high-efficiency heating and hot water systems, as well as smart thermostats, that will enable customers to save costs and help the environment.

**Q. How will the Companies identify customers for purposes of participating in the LMI Gas Conversion Program?**

A. The Companies offering will be available to low-income customers who are eligible to participate in the Energy Affordability Program, the criteria for which is further discussed in the direct testimony of the Shared Services Panel. For moderate income customers, the Companies will expand LMI Gas Conversion Program participation to those whose income is 60 percent to 80 percent of the State or area median income, whichever is higher.

**Q. Why do the Companies believe the LMI Gas Conversion Program would be beneficial for customers?**

A. The program would benefit LMI customers who will realize lower energy bills from a less carbon intensive heating source. Overall, this would improve their energy affordability and their carbon footprint. Installing high efficiency heating and hot water equipment would also allow the Companies to connect customers with other energy efficiency and social services to further decrease their energy burden. Finally, to the extent the LMI Gas Conversion Program retrofits are combined with the Residential Methane Detector Program supported by the Gas Safety Panel, customers will also enjoy an added safety benefit. The BCA for

the LMI Gas Conversion Program is set forth in Exhibit ___ (FOH-2), Schedules 5 and 6.

**Q. What are the projected costs for the proposed LMI Gas Conversion Program?**

A. As shown in Exhibit ___ (FOH-13), Schedule 1, KEDNY's projected costs are $1.6 million for the Rate Year and the Data Years. For KEDLI, the projected costs are $1.8 million for the Rate Year and the Data Years, as shown in Exhibit ___ (FOH-13), Schedule 2.

## E. <u>Economic Development</u>

### 1. *Grant Programs*

**Q. Please describe the current economic development grant programs in the KEDNY and KEDLI service territories.**

A. KEDNY and KEDLI currently offer identical portfolios of eight economic development grant programs in each of their respective service territories. Implemented in the 2016 KEDNY and KEDLI Rate Cases, these programs provide financial grants and incentives to customers to meet the following economic development objectives:

1. Urban Revitalization - the Cinderella program supports the redevelopment of vacant commercial and mixed-use buildings and revitalization of distressed commercial districts;
2. Infrastructure Assistance – the Capital Investment Incentive program offsets the cost of upgrading gas infrastructure for growing C&I customers;
3. Brownfield Redevelopment – supports remediation and redevelopment of brownfield sites and abandoned buildings in the service territories;
4. Industrial Building Redevelopment – funds infrastructure to redevelop large, vacant or underutilized industrial properties into multi-tenant commercial space;
5. Sustainable Gas and Economic Development – provides funding for demonstration projects involving sustainable gas technologies that generate regional economic development benefits;
6. Manufacturing Productivity – funds productivity improvement and efficiencies for small- and medium-sized manufactures that use gas in their processes;
7. Cleantech Incubation – provides financial support for clean energy and other high-tech businesses; and

8. Cooperative Business Recruitment – provides grants to promote new business investment and jobs in the Companies' service territories.

**Q. What is the current level of funding for these grant programs?**

A. The current level of funding is $2 million per year for each of the Companies.

**Q. How much grant funding has been awarded to customers thus far during the current rate plan, and how much funding has been committed through approved applications?**

A. Through February 28, 2019, a total of $0.193 million has been awarded to customers, $0.068 million for KEDNY and $0.125 million for KEDLI. An additional $1.990 million has been committed through approved applications, $1.550 million for KEDNY and $0.440 million for KEDLI.

**Q. Please describe the current treatment of economic development grant expenditures compared to those allowed in base rates.**

A. For both KEDNY and KEDLI, actual grant expenditures are reconciled against the amounts included in rates, subject to a downward only reconciliation. Any under expenditures in a given year are carried forward

and reconciled at the end of KEDNY and KEDLI's current three-year rate plan, which runs from January 1, 2017 through December 31, 2019 ("KEDNY and KEDLI Rate Plan").

**Q. What is the forecast of economic development grant expenditures through the end of the KEDNY and KEDLI Rate Plan?**

A. KEDNY and KEDLI project an accumulated under expenditure of $4.7 million and $5.2 million, respectively.

**Q. What factors are responsible for the underspend?**

A. The Companies' portfolio of grant programs was modified and expanded significantly in CY 2017. Seven new programs were implemented for both KEDNY and KEDLI, and the eighth program was modified significantly. While the Companies anticipated a gradual increase in grant awards for the new programs due to their dramatically different scope and scale, the ramp-up in activity has been slower than anticipated, particularly during CY 2017, the first year of program implementation. It has taken longer than expected to build customer and stakeholder awareness of the new programs, many applications have taken longer than expected to be developed and submitted by the applicant, and many of the approved applications have involved projects with relatively long development and

construction timelines. Lastly, the eligibility requirements for some of the new programs have proven more restrictive than anticipated, resulting in a lower than expected number of qualifying applicants.

**Q. Are the Companies proposing any modifications to its existing portfolio of grant programs?**

A. Yes. The Companies are proposing to create a new grant program that would encourage customers and developers to invest in projects involving alternatives to traditional gas delivery service and efficient, emerging natural gas technologies. Eligible technologies would include, but not be limited to, geothermal, solar thermal, thermal storage, combined heat and power ("CHP"), fuel cells, biomass, microgrids, anaerobic digestion, and thermal cooling/chilling. Eligible projects would also be required to demonstrate regional economic impacts through the expansion or attraction of businesses in the Companies' service territories. Applicants will also be encouraged to use self-generated or purchased RNG to meet some or all their gas supply requirements. The proposed program is intended to support the Companies' larger Future of Heat initiatives, strengthen the market for RNG supply, and generate regional economic development benefits in the form of new or retained jobs and new capital investment.

Additionally, KEDNY and KEDLI are proposing modifications to several of their existing Economic Development grant programs to make them more responsive to customer needs and more compatible with the clean energy economy. For example, the Companies propose to expand eligibility for the Cinderella Program to include partially occupied buildings under specific and limited circumstances. The Companies further propose to modify the eligibility requirements for the Capital Investment Incentive program to allow additional customer classifications and types of gas infrastructure investment to be eligible for funding. Finally, KEDNY and KEDLI propose to more closely align the existing programs with the broader Future of Heat proposal by adding funding and eligibility guidelines that would encourage the use of RNG and strengthen the connection between energy efficiency and economic development. A detailed description of each program, including the proposed modifications, is set forth in Exhibit ___ (FOH-7).

**Q. Will these proposed changes increase the level of customer participation in the Economic Development grant programs?**

A. Yes. The Companies expect the changes to drive increased levels of activity as measured by applications submitted, applications approved, and grant funding reimbursed to customers. A forecast of annual grant

expenditures compared to the proposed levels of funding over the four-year rate term is set forth in Exhibit ___ (FOH-8).

**Q. Are the Companies proposing to adjust the level of funding for economic development grant programs?**

A. Yes. As set forth in Exhibit ___ (FOH-13), KEDNY and KEDLI propose to reduce the level of incremental grant program funding to $0.500 million for each company in the Rate Year, and to increase that amount by $0.500 million in each of the Data Years, with the revenue requirement including $1.0 million for each company in Data Year 1, $1.5 million for each company in Data Year 2, and $2.0 million for each company in Data Year 3.

**Q. Given the proposed reduction in incremental funding and the anticipated increase in grant program activity, how do KEDNY and KEDLI propose to maintain adequate funding for the programs?**

A. The Companies believe adequate funding is available from the initial carryover balances ($4.7 million for KEDNY and $5.2 million for KEDLI), the proposed incremental funding discussed above, and the continuation of the existing deferral mechanism for reconciling and recovering grant program expenditures. Exhibit ___ (FOH-8) further sets

forth the proposed grant program funding in the Rate Year and the three Data Years, along with projected program spending in each year.

**Q. Please describe the deferral mechanism.**

A. Under the deferral mechanism, actual grant expenditures would continue to be reconciled against the amounts included in rates, subject to a downward only reconciliation. Any under expenditures would be carried forward and reconciled at the end of Data Year 3. In the event of any anticipated over expenditures at the end of Data Year 3, the Companies would petition the Commission for deferral treatment of such amounts.

**2. *Discount Programs***

**Q. Please describe the Companies' current economic development discount programs.**

A. KEDNY offers a Business Incentive Rate ("BIR") under which eligible new and expanding customers receive a distribution rate discount of 50 percent on eligible incremental gas usage for a twelve-year period, after which time the discount is phased out over an additional three-year period. Among the criteria that may qualify a customer for BIR discounts is receipt of benefits through an Industrial Development Agency ("IDA"). KEDNY also offers an Excelsior Jobs Program, under which certified

participants in the New York State Excelsior Jobs program receive a marginal cost-based delivery rate (currently $0.104/therm) on eligible incremental gas usage for up to ten years. Lastly, KEDNY offers an Area Development Rate which provides distribution rate discounts of 35 percent for a five-year period to customers that locate or expand in specific development areas of the KEDNY service territory.

KEDLI offers a BIR under which eligible new and expanding customers receive a distribution rate discount of 35 percent for a seven-year period, after which time the discount is phased out over an additional three-year period. KEDLI also offers an Excelsior Jobs Program, under which certified participants in the New York State Excelsior Jobs program receive a marginal cost-based delivery rate (currently $0.184/therm) on eligible incremental gas usage for up to ten years.

**Q. Please describe the recent and current levels of customer participation in KEDNY and KEDLI's economic development discount programs.**

A. Customer participation in the discount programs has generally been flat in both KEDNY and KEDLI's service territories, as measured by the number of customers participating and total discounts provided. The KEDNY

Area Development Rate has become virtually inactive, with only two participants remaining in the program.

**Q. Why has the KEDNY Area Development Rate become inactive?**

A. The development areas targeted by the KEDNY Area Development Rate were identified more than 25 years ago, when those areas of the KEDNY's service territory were considered economically depressed. Since that time, the targeted areas have changed dramatically in terms of their level of economic activity and their need for development incentives such as the Area Development Rate.

**Q. Are the Companies proposing any changes to their existing portfolio of economic development discount programs?**

A. Yes. KEDNY is proposing to modify its Area Development Rate to remove the current targeted areas from program eligibility and replace them with areas that better reflect the current economic development priorities and objectives of NYC and New York State. The proposed targeted areas are: (i) Industrial Business Zones ("IBZs") that were established by NYC to protect existing manufacturing districts and encourage industrial growth by offering expanded services to industrial and manufacturing businesses within the designated IBZs, 15 of which are

located in KEDNY's service territory; (ii) State Brownfield Opportunity Areas ("BOAs"), which are designated by the New York Department of State as areas where municipalities and community-based organizations are eligible for financial and technical assistance to address the presence of brownfield sites in the BOA, eleven of which are located in the KEDNY and KEDLI service territories; and (iii) federal Opportunity Zones recently nominated by the State pursuant to the U.S. Department of Treasury's Opportunity Zones Program that are designed to spur investment and create jobs in distressed communities through tax benefits for investments located in the zones, which include census tracts in the Companies' service territories.

KEDLI is proposing to create a similar Area Development Rate, which would also rely on the same targeted areas that have already been designated as economic development priorities through federal and state development programs.

Lastly, KEDNY and KEDLI propose that eligibility for the BIRs be broadened to include qualifying tenant businesses locating or expanding in properties receiving benefits from an IDA. Currently, the BIR is available

only to the IDA beneficiaries themselves, and not to growing customers who are tenants within the designated properties.

**Q. How are the Companies proposing to recover discounts provided to customers?**

A. The Companies propose to implement a deferral mechanism whereby actual discounts are reconciled against targets (forecasts) established in rates. Each year of the Rate Plan, actual economic development discounts would be reconciled to the amount reflected in rates for refund to or recovery from customers. An example of the proposed mechanism is set forth in Exhibit ___ (RRP-9), Schedule 1.

**Q. How would gas customers benefit from the Companies' proposed changes to its economic development grant and discount programs?**

A. The proposed revisions to the Companies' economic development grant and discount programs will make them more responsive to customer needs and will generate benefits in the form of new and retained jobs, new capital investment, and higher regional earnings in the communities the Companies serve. The proposed modifications will also better align the KEDNY and KEDLI programs with New York State economic development policy, while also supporting the Companies' broader

efforts to transition its service territories economy to a cleaner energy future.

## V. Reducing Carbon Emissions on the Gas Network

**Q. Please explain why the reduction of carbon emissions is an important part of the Future of Heat strategy?**

A. The Companies believe a holistic approach is necessary to drive meaningful change toward a low-carbon future. This approach includes the aforementioned focus on network efficiency (*e.g.*, reducing system leaks) and demand-side energy management (*e.g.*, energy efficiency), as well as supply-side products capable of delivering carbon reductions on the gas and electric networks. As set forth below, the Companies intend to accomplish this through the production and distribution of RNG, as well as continued RD&D to drive further improvements in technology and lower costs for customers.

By including gas supply in their efforts to develop the low-carbon energy system of the future, the Companies can provide customers access to clean-energy choices that do not require deep retrofits or lifestyle changes. Moreover, adding the supply-side component allows the Companies and local communities to beneficially use biogas created by

wastewater treatment and food waste, mitigating some of the environmental impacts of these waste streams. Finally, with the development of P2G, the Companies can combine complementary electric and gas technologies to enhance the environmental benefits for both energy sectors through the production of lower-carbon RNG and by using the gas network to store excess renewable energy.

### A. Renewable Natural Gas ("RNG")

**Q. What is RNG?**

A. RNG is a term generally used to describe pipeline compatible gaseous fuel derived from biomass or other renewable sources that has lower lifecycle $CO_{2e}$ emissions than geological natural gas. RNG feedstocks include manure, food waste, wastewater treatment plants, or other biomass sources, often using an anaerobic digester. With recent advancements to lower the cost of gasification technology, feedstocks with lower moisture content can also be used to produce RNG (*e.g.*, municipal solid waste or agricultural residues). Furthermore, with new technological innovations, production of RNG is moving beyond biomass to include renewable electricity, often referred to as power-to-gas or P2G. This concept includes either adding hydrogen to the existing gas system (*i.e.*, hydrogen blending) or producing synthetic methane by

combining hydrogen and carbon dioxide. Collectively, RNG offers new ways to decarbonize the gas network by reducing the carbon footprint of the fuel supply in a manner similar to the way solar and wind technology reduce the carbon footprint of electricity.

**Q. Please describe how the Companies have used RNG.**

A. The Companies have over 30 years of experience integrating RNG into the gas distribution network, starting with the Staten Island Landfill project. The Staten Island project – the oldest operating RNG facility in the U.S. – continues to contribute RNG to National Grid's distribution network. In addition, since 2009, the Companies have partnered with NYC to deliver RNG from the City's largest wastewater treatment plant. In doing so, the Companies and NYC seek to animate the RNG market and highlight opportunities for expanded use of this valuable energy resource. In 2010, National Grid published a white paper outlining the potential for RNG to make a significant contribution to the reduction of greenhouse gas emissions. The following year National Grid advised the American Gas Foundation on a national study, assessing the potential from RNG from biomass. More recently, the Companies collaborated on a New York Standard Interconnection Guideline to establish a clear

process for both project developers and utilities to successfully connect RNG projects.

**Q. Please discuss the Companies' RNG proposals.**

A. KEDNY is continuing to progress the Newtown Creek Project ("Newtown Project"), and KEDLI proposes a new P2G Demonstration Project ("P2G Project"). The Newtown Project is supported by the data sheet summary contained in Exhibit ___ (FOH-5), and the P2G Project is supported by the data sheet summary contained in Exhibit ___(FOH-6). The Companies also jointly propose a hydrogen blending study in partnership with I-GIT, and, as set forth in the GIOP testimony, they are seeking to facilitate RNG interconnections by reducing upfront costs and leveraging their technical expertise and economies of scale to own and install portions of RNG systems that are core utility functions and in doing so lower the barrier of entry for RNG developers.

### 1. *Newtown Creek Project*

**Q. Please describe the Newtown Project and its current rate treatment.**

A. The Newtown Project, located at the New York City Newtown Creek Wastewater Treatment Plant, seeks to reduce greenhouse gas emissions by promoting RNG as a long-term supply source. KEDNY will capture the biogas generated from the wastewater plant, which consists of approximately 60 percent methane and 40 percent $CO_2$, filter it through a purification facility and upgrade it to pipeline quality natural gas. The RNG is then odorized and injected into the gas system for direct use by customers.

Because the in-service date and capital costs were not known at the time rates were set in the 2016 KEDNY and KEDLI Rate Cases, the costs for the Newtown Creek project are not currently included in rates. However, the Joint Proposal authorizes KEDNY to defer the return of and on the Newtown Project once it was placed in service. In addition, the Joint Proposal provides that the revenue requirement in a future rate case would be subject to a potential $1.6 million annual exclusion (prorated from the in-service date) for 20 years and reflect a 40-year depreciable life. However, the potential exclusion would be reviewed for possible modification, with any property tax abatement or revenues from the sale

of gas or environmental credits produced by the Newtown Creek project used as potential offsets to the exclusion.

**Q. What are the benefits associated with the Newtown Project, and how do those benefits align with the State's clean energy goals?**

A. The Newtown Project will expand the concept of renewable energy to more fully develop RNG as a viable alternative to conventional natural gas resources. In doing so, the RNG will enhance the diversity of the gas supply, provide a new method for managing local waste resources, and reduce greenhouse gas emissions in furtherance of the State's clean energy policy goals and the REV objectives. In total, KEDNY anticipates the Newtown Project will produce approximately 277,500 Dth of pipeline quality RNG, reducing $CO_2$ emissions by approximately 16,000 tons annually. In a separate partnership, NYC is working with Waste Management to incorporate processed food waste into the wastewater sludge at Newtown Creek. The combined projects have the potential to reduce annual $CO_2$ emissions by 90,000 metric tons.

**Q. What is the status of the Newtown Project?**

**A.** By June 2018, KEDNY secured all necessary permits and subsequently began project construction in July. Those efforts are currently on

schedule, and KEDNY expects to bring the project online in November 2019. In addition to the construction activities, KEDNY issued a request for proposal ("RFP") in 2018, seeking a firm to monetize the environmental attributes KEDNY expects to generate from the injection of RNG into the local distribution system. KEDNY selected Element Markets to complete this task. KEDNY and Element Markets are currently collaborating to register the project under the federal Renewable Fuel Standard ("RFS") Program as a generator of Renewable Identification Numbers ("RINs").

**Q. Is KEDNY proposing to include the costs of the Newtown Project in rates?**

A. Yes. As shown in Exhibit ___ (RRP-7), Schedule 1, KEDNY expects the Newtown Project will be in service by the end of CY 2019 with a total capital cost of approximately $32 million. This includes $18.911 million in construction work in progress, as of December 31, 2018, as well as $3.929 million in the remainder of FY 2019, $9.099 million incurred in FY 2020, and $0.1 million in the Rate Year. The capital costs include design work, construction, and equipment. As further set forth in the direct testimonies of the Shared Services Panel and the Revenue Requirements Panel, the revenue requirement also includes the property

tax net of the abatement, as well as a 20-year depreciation life, respectively.

In addition, as shown in Exhibit ___ (FOH-13), Schedule 1, the revenue requirement includes O&M costs of $0.668 million in the Rate Year inflated through Data Year 3. The O&M costs include the amounts necessary to run the RNG upgrading facility, the primary component of which is the electricity costs, as well as amounts to purchase replacement parts and perform annual maintenance

**Q. Does KEDNY expect to generate revenue from the Newtown Project?**

A. Yes. KEDNY anticipates revenue both from the sale of RNG and from monetizing the project's environmental attributes.

**Q. How does KEDNY propose to treat the project revenues?**

A. As set forth in the Rate Design Panel testimony, KEDNY developed a revenue mechanism to offset project costs through the sale of RNG produced from the project, as well as any revenues realized from monetizing the associated environmental attributes. Specifically, Exhibit ___ (RDP-2) includes a revenue estimate of $1.9 million per year,

comprised of $1.0 million from the gas sales and $0.9 million from the sale of environmental attributes.

KEDNY proposes to true-up the actual revenues, such that any variances will be deferred for future refund to (or recovery from) KEDNY customers. Any revenues realized above the level necessary to fully reimburse customers for the project costs will be shared evenly between customers and NYC beginning in the fifth year after the project becomes operational. Revenue sharing will then be assessed every year thereafter for the remainder of the project. KEDNY will track these costs on an annual basis and compare to the project's cumulative revenue requirement.

**Q. How did KEDNY calculate the estimated value of the environmental attributes included in the Rate Design Panel's revenue offset mechanism?**

A. KEDNY calculated the value of the environmental attributes by evaluating the primary markets for RNG credits: (i) the federal RFS; and (ii) California's Low Carbon Fuel Standard ("LCFS"). In 2019 the value of RNG from food waste (classified as D5 under the RFS) is roughly $4/Dth, and the value of RNG from wastewater (classified as D3) is roughly $26/Dth. These values, however, vary due to market changes, and

KEDNY expects significant variability in the market values over time. The LCFS currently provides a financial incentive of approximately $5.70/Dth, which can be additive to the RFS value if the RNG is ultimately sold to a transportation customer in California. Based on this review, KEDNY conservatively estimates it will receive $0.900 million per year in revenue from marketing the attributes. The actual revenue generated, however, is highly dependent on the volume of biogas produced, what proportion of the volume is designated as D3 or D5, and the price volatility of the RFS and LCFS markets.

**Q. Does KEDNY believe that circumstances warrant elimination of the $1.6 million exclusion in the Joint Proposal?**

A. Yes. At the time the exclusion was established, there was some uncertainty with respect to the potential benefits to customers from the Newtown Project. As discussed above, the project is one of the first in the U.S. to directly inject RNG into a local distribution system, helping decarbonize the gas supply and meet New York State's clean energy goals. Between the property tax exemption KEDNY obtained from NYC (discussed in the Shared Services Panel's testimony) and the forecast revenues set forth above, the project will deliver monetary and societal

benefits in excess of the $1.6 million exclusion. Therefore, the Companies believe the exclusion is not warranted.

**Q. How has the Newtown Project supported RNG development?**

**A.** KEDNY's partnership with NYC on the Newtown Project was one of the first of its kind in the U.S. Although the partnership began with a focus on helping NYC meet its environmental goals, it is also helping to demonstrate how energy providers and other stakeholders can collaborate to incorporate RNG into the gas supply portfolio to achieve clean energy goals, enhance reliability, and meet growing energy demands. The Companies' have already started using lessons learned from the development of the project to educate other utilities, RNG project developers, and internal teams on how to plan, develop, and incorporate RNG resources into the natural gas distribution system.

### 2. *P2G Demonstration Project ("P2G Project")*

**Q. Please describe what is meant by the term "power-to-gas."**

A. P2G refers to the technical and economic potential of converting excess renewable electricity to hydrogen or synthetic methane (*i.e.*, RNG) and utilizing the existing natural gas network to deliver the gas produced using these renewable resources. Indeed, P2G can serve as a form of

large-scale, long-duration energy storage when used to convert excess renewable electricity that would otherwise be curtailed – a situation that is expected to occur with increasing interconnection of renewable resources including large-scale offshore wind – is converted into RNG. P2G can also provide low- or zero-carbon RNG, depending on the feedstocks used for production. The technology holds considerable promise for addressing clean-energy goals, as it has the potential to support deep decarbonization of the transportation and heating sector, which are two sectors of the economy that have proven challenging to decarbonize.

**Q. Please describe the P2G Project.**

A. KEDLI proposes to develop a P2G design that combines existing hydrogen production technology (*i.e.*, an electrolyzer) and cutting-edge methanation technology (*i.e.*, a bioreactor) to produce pipeline-quality RNG capable of meeting gas system requirements. In doing so, KEDLI seeks to partner with federal and local government (*i.e.*, NREL and NYC, respectively), as well as industry collaborators, such as Electochaea GmbH, an innovative technology provider that develops bioreactors, to design and engineer the P2G Project.

**Q. What are the benefits associated with the proposed P2G Project, and how do those benefits align with the Commission's REV policy objectives and the State's clean energy goals?**

A. Combining electolyzers and bioreactors to produce pipeline quality RNG from renewable energy will help KEDLI lower carbon emissions, reduce gas constraints, and provides a key outlet for excess renewable energy. This last piece, the potential to store renewable energy, has taken on growing importance with the accelerated offshore wind targets and on-shore wind and solar generation goals announced by Governor Cuomo in the 2019 State-of-the-State address. The last piece is key, as use of renewable electricity to produce methane will prove an increasingly valuable method of energy storage with the proliferation of distributed generation and large-scale renewable energy projects. In effect, the gas distribution system will store excess renewable electricity that would otherwise be curtailed. Moreover, the RNG produced through the P2G process will help offset sectors, such as heavy transportation and industry, which have proven difficult to decarbonize.

**Q. What is the P2G Project schedule?**

A. KEDLI will begin scoping, design, and engineering of the P2G Project in 2019, including the execution of agreements with project partners and

site owners. KEDLI further anticipates full project design will be completed in October 2023. With design at 100 percent, KEDLI will submit a proposal for recovery of the full project costs.

**Q. What is the projected cost of the P2G Project?**

A. As shown in Exhibit ___ (FOH-13), Schedule 2, the KEDLI revenue requirement for the P2G Project includes O&M costs of $0.650 million in the Rate Year, $1.825 million in Data Year 1, $0.725 million in Data Year 2, and $0.325 million in Data Year 3. The O&M amounts reflect KEDLI's forecast for scoping, designing, and engineering the P2G Project. If the project scoping, design, and engineering is complete prior to KEDLI's next rate case, the company will petition the Commission for approval to move forward with project construction, deferring the revenue requirement associated with any costs that exceed the $3.525 million proposed here, for recovery in KEDLI's next rate case. Any such costs that receive deferral treatment would be excluded from KEDLI's net plant tracker.

### 3. *Hydrogen Blending*

**Q. What is hydrogen blending?**

A. Hydrogen blending involves adding hydrogen into the gas system to augment natural gas supplies. The hydrogen is either produced from water electrolysis using excess renewable electricity or from natural gas, a process referred to as steam methane reforming.

**Q. Why do the Companies believe hydrogen blending is an important part of the strategy for the low-carbon future of the heating sector?**

A. Hydrogen blending holds promise for the future of the heating sector for three reasons. First, combusting hydrogen can have zero carbon emissions if produced from renewable electricity. Second, using hydrogen blending as a low-carbon supply-side resource may prove to be an efficient way to rapidly lower the carbon intensity of end-uses fueled by natural gas without requiring the replacement of appliances or performing extensive building retrofits. Third, blending hydrogen with natural gas, like P2G, could serve as a method for storing excess energy generated by anticipated increases in renewable generation from solar and wind; effectively reducing carbon emissions while bolstering gas supplies.

**Q. Please describe the Companies' hydrogen blending project.**

A. The Companies propose a hydrogen blending study in partnership with I-GIT. The purpose of the study is to further analyze the impact of blending hydrogen into the natural gas system, to determine the percentage of hydrogen that can be safely blended into the Companies' gas distribution systems without negatively impacting the natural gas network or customer appliances. The Companies and I-GIT will evaluate the technology and risks associated with hydrogen blending, establish safety protocols, analyze the chemical changes to pipeline materials created by different mixtures of hydrogen, as well as the operational and engineering issues created by hydrogen blending. The Companies believe the hydrogen blending study is a necessary precursor to the development of a hydrogen blending demonstration project.

**Q. What is the cost of the hydrogen blending study?**

A. The Companies expect the hydrogen blending study to cost $0.446 million, split evenly between KEDNY and KEDLI to cover I-GIT's research work. To offset a portion of that amount, the Companies and I-GIT submitted a concept paper to NYSERDA in response to Program Opportunity Notice 3249. NYSERDA accepted the concept paper, and the Companies, along with I-GIT, submitted a full proposal for

NYSERDA's consideration in April. If awarded the grant, it could cover approximately $0.346 million of the study costs. Of the $0.100 million that would remain, $0.070 would be incremental to the Historic Test Year, and would be split evenly between the Companies, as shown in Exhibit ___ (FOH-13).

#### 4. *RNG Interconnections*

**Q. Please describe the Companies' RNG interconnection proposal.**

A. As set forth in KEDNY and KEDLI's GIOP testimonies, the Companies propose to leverage their technical expertise and economies of scale to facilitate RNG interconnections by installing and owning parts of distributed RNG facilities. Like most renewable energy development, RNG projects require large upfront capital investments, which can prove an impediment to adoption. A portion of the upfront capital needed for RNG projects is due to the Companies' equipment and engineering requirements, which were established to ensure safe interconnection of RNG projects. To make it easier for customers to install low-carbon RNG resources, the Companies propose engineering, installing, and owning pieces of RNG interconnection equipment (*e.g.*, meters, odorizors, and spectrometers) at project sites.

The Companies are also focused on shortening the interconnection approval period to make RNG development a more efficient process for project developers. To that end, the Companies propose to create a new Future of Heat Engineering department that will include additional FTEs to review and process interconnection applications. These additional FTEs are discussed more fully below. The Companies are currently in discussions with six project developers looking to interconnect such distributed RNG facilities to serve KEDNY and KEDLI customers with feedstocks including municipal solid waste, food waste, and wastewater.

### 5. *Future of Heat Engineering Group*

**Q. Do the Companies propose any FTEs to implement the gas decarbonization strategy?**

A. Yes. As mentioned above, the Companies propose to establish a new Future of Heat Engineering Group under the Asset Management portion of the Gas Business Unit. The new group would consist of five incremental FTEs – a director and four engineers – with two-thirds of the directors' time and 100 percent of the engineers' time evenly split among KEDNY and KEDLI.

**Q. Please describe the roles and responsibilities of the Future of Heat Engineering Group.**

A. As the Companies shift their efforts to meeting heating needs through a decarbonized gas supply and to meet aggressive clean energy goals using NPAs and RNG projects, the Companies anticipate a need for additional FTEs to manage NPA market solicitations, timely review project proposals, and coordinate with project partners and other interested stakeholders. The new Future of Heat Engineering Group will focus on understanding and evaluating RNG, hydrogen blending, and NPA solicitations to determine whether they are cost-effective, viable solutions, and, in some instances, whether they are capable of displacing traditional capital projects.

**Q. What are the costs of the new group?**

A. As shown in Exhibit ___ (FOH-13), the costs of the new group include incremental O&M of $0.423 million for KEDNY and $0.313 million for KEDLI in the Rate Year. In the Data Years, KEDNY would incur $0.540 million in Data Year 1, $0.660 million in Data Year 2, and $0.776 million in Data Year 3. For KEDLI, the revenue requirement includes $0.374 million in Data Year 1, $0.438 million in Data Year 2, and $0.497 million in Data Year 3.

**B. Research, Development, and Demonstration ("RD&D")**

**Q. Do the Companies' participate in any end-use RD&D efforts?**

A. Yes. The Companies are active participants in two end-use RD&D programs: (i) the Gas Technology Institute's ("GTI") Utilization Technology Development ("UTD") program; and (ii) I-GIT, which is a unit of the Advanced Energy Research and Technology Center at Stony Brook University.

**Q. Please describe the Companies participation in the UTD program.**

A. The UTD program is a utility-funded collaborative with 20 members across North America. It supports research, analysis, and deployment of advanced technologies that are increasingly efficient and environmentally beneficial, such as thermal heat pumps that cost-effectively reduce peak and greenhouse gas emissions. Member utilities may allocate their contributions to specific projects, such as thermal heat pump research, that support their objectives.

National Grid, for example, is the product champion for the Thermolift, which is a client of the Clean Energy Business Incubator Program at Stony Brook University. The Thermolift research focuses on developing a thermal heat pump capable of using RNG or solar to meet heating

needs. Thus far, the Thermolift heat pump has exceeded its testing goals, and drawn support from the NREL and NYSERDA. Alternatively, UTD participants may make a block contribution, known as the Sustaining Members program, to a research portfolio determined by GTI. Collectively, the UTD research is supporting long-term projects that enable the use of RNG, hydrogen, and hydrogen blends. The technology investigated by the UTD collaborative includes items not eligible for support from the Millennium Fund, or which are otherwise unsuitable for funding by manufacturers.

**Q. Are there any costs associated with the Companies participation in the UTD program?**

A. Yes, as reflected in the Historic Test Year, the Companies each pay $0.175 million in annual costs to participate in the UTD program. The Companies propose to continue their membership in the UTD program at that level.

**Q. Please describe the Companies participation in I-GIT.**

A. The Companies, Stony Brook University, and other academic and industry leaders launched I-GIT in 2018 as a comprehensive initiative focused on finding clean, affordable energy solutions capable of meeting growing clean energy demands. I-GIT research goes beyond scientific

research, focusing on business and policy objectives related to the future of the heating sector. This work includes using I-GIT's innovative research, analysis, and education platform to accelerate deployment of advanced energy technologies and infrastructure that will provide community residents and businesses with value-added gas services.

**Q. What work has I-GIT accomplished in its first year of operation?**

A. Since its launch in 2018, I-GIT supported development RNG projects with dairy farmers, the utilization of RNG at State facilities, and the integration of hydrogen into gas distribution systems. In addition, I-GIT reviewed the Companies gas REV demonstration projects.

**Q. Are there any costs associated with the Companies participation in I-GIT?**

A. Yes. As shown in Exhibit ___ (FOH-13), the KEDNY and KEDLI revenue requirements include $0.050 million in annual costs for the I-GIT program.

**Q. Do the Companies propose any non-end use operational RD&D?**

A. Yes, the Companies' request for non-end use operational RD&D is supported by KEDNY and KEDLI's GIOP testimonies.

## VI. Performance-Based Incentives and Revenue Sharing

### A. EAMs

**Q. Please summarize the Companies' EAM proposals.**

A. The Companies propose the following EAMs, which are designed to support the Commission's REV objectives and the State's clean energy goals:

(i) System Efficiency;

(ii) Energy Efficiency; and

(iii) Carbon Reduction.

**Q. Please describe how the Companies developed their EAM proposal.**

A. The Companies EAM proposals are intended to encourage achievement of priorities like system efficiency, while also identifying unique ways to engage customers. The proposals focus on ways to achieve the State's clean energy goals, the Commission's REV objectives, and the Companies' commitment to sustainably and affordably meeting customers' heating requirements. To that end, the Companies identified a broad array of initiatives and EAM metrics that align with the Companies' strategic focus. The Companies then set targets for those metrics at levels that require incremental effort and robust customer adoption to achieve. Based on the costs and benefits of achieving the targets, the Companies

assigned basis points to the proposals. The resulting EAM metrics and basis points collectively establish meaningful incentives for the Companies. Summary tables of the proposed targets and associated basis points are included in Exhibit __ (FOH-10).

**Q. How does KEDNY propose to allocate basis points across the three EAMs?**

A. KEDNY proposes allocating the basis points as follows:

| KEDNY EAM Maximum Incentive Basis Points (bps) | | | | |
|---|---|---|---|---|
| **EAMs and Associated Metrics** | **2020** | **2021** | **2022** | **2023** |
| **System Efficiency** | 25 | 25 | 25 | 25 |
| Peak Reduction | 5 | 5 | 5 | 5 |
| Supply Diversification | 20 | 20 | 20 | 20 |
| **Energy Efficiency** | 50 | 30 | 30 | 30 |
| Incremental Energy Efficiency | 40 | 20 | 20 | 20 |
| Affordability* | 10 | 10 | 10 | 10 |
| **Carbon Reduction** | 3 | 8 | 8 | 8 |
| $CO_{2e}$ Reduction – Full Service | 1 | 3 | 3 | 3 |
| $CO_{2e}$ Reduction – Transportation | 2 | 5 | 5 | 5 |
| **Total** | 78 | 63 | 63 | 63 |

*Basis points for the Affordability metric are estimated, as the metric is calculated based on the level of incremental achievement.

**Q. How does KEDLI propose to allocate basis points across the three EAMs?**

A. KEDLI proposes allocating the basis points as follows:

| KEDLI EAM Maximum Incentive Basis Points (bps) |
|---|

| EAMs and Associated Metrics | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| **System Efficiency** | 23 | 23 | 23 | 23 |
| Peak Reduction | 3 | 3 | 3 | 3 |
| Supply Diversification | 20 | 20 | 20 | 20 |
| **Energy Efficiency** | 50 | 30 | 30 | 30 |
| Incremental Energy Efficiency | 40 | 20 | 20 | 20 |
| Affordability* | 10 | 10 | 10 | 10 |
| **Carbon Reduction** | 4 | 9 | 10 | 11 |
| $CO_{2e}$ Reduction – Full Service | 2 | 4 | 5 | 6 |
| $CO_{2e}$ Reduction – Transportation | 2 | 5 | 5 | 5 |
| **Total** | 77 | 62 | 63 | 64 |

**Basis points for the Affordability metric are estimated, as the metric is calculated based on the level of incremental achievement.

**Q. Do the Companies propose the EAMs become effective in CY 2020?**

A. Yes. The Companies believe the EAMs should be measured on a calendar year basis, beginning in CY 2020, similar to how the Customer Service Quality and Gas Safety Performance metrics are measured. CY treatment would also align with NMPC's EAMs.

***1. System Efficiency***

**Q. Please describe the Companies' proposed System Efficiency EAM.**

A. The proposed System Efficiency EAM is composed of two metrics: (i) Peak Reduction; and (ii) Supply Diversification. The intent of the Peak Reduction metric is to encourage gas demand reduction during peak events, which will enable the Companies' to focus commodity and resources on constrained portions of the network. The Supply

Diversification metric will promote incremental development of local pipeline quality gas (*i.e.*, RNG). Increasing RNG interconnections diversifies the Companies' supply portfolio to include local sources, resulting in a more resilient system.

### a. Peak Reduction

**Q. Please explain the Peak Reduction metric.**

A. The Companies' proposed Peak Reduction metric will be calculated by measuring reduction of gas usage during peak events and averaging the reduction across all peak events called during the winter season as part of the Companies' expanded Demand Response Demonstration Project. Reductions will be measured at participating customer sites, benchmarked against customers' weather-normalized baselines, and aggregated.

**Q. What does KEDNY propose for its Peak Reduction targets and associated basis points?**

A. KEDNY proposes the following net peak reduction targets and associated basis points for achieving the targets:

| KEDNY Annual Peak Reduction Targets (average Dth/hour/event) and Basis Points (bps) | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 510 | 638 | 766 | 893 | 1 |
| **Target** | 561 | 702 | 842 | 983 | 3 |
| **Maximum** | 612 | 766 | 919 | 1,072 | 5 |

**Q. What does KEDLI propose for its Peak Reduction targets and associated basis points?**

A. KEDLI proposes the following net peak reduction targets and associated basis points for achieving the targets:

| KEDLI Annual Peak Reduction Targets (average Dth/hour/ event) and Basis Points (bps) | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 232 | 290 | 348 | 406 | 1 |
| **Target** | 255 | 319 | 383 | 447 | 2 |
| **Maximum** | 278 | 348 | 418 | 487 | 3 |

**Q. How did the Companies establish the targets?**

A. The Companies used forecasts for the expanded Demand Response Demonstration Project as a starting point for the Peak Reduction targets, setting the minimum targets equivalent to the forecasts. Midpoint and maximum targets reflect incremental effort required to exceed the design of the expanded demonstration, which may be achieved by increasing customer enrollment and lowering program costs per Dth of reduced gas

consumption. The midpoint and maximum targets assume additional growth beyond the base levels of approximately 10 percent and 20 percent, respectively.

**b. Supply Diversification.**

**Q. Please describe the proposed Supply Diversification metric.**

A. The proposed outcome-based Supply Diversification metric will measure the sum of incremental RNG introduced into the natural gas network in the Companies' service territories each year. To achieve the targets, the Companies expect to work in collaboration with third parties to increase RNG development through initiatives such as the New York Standard Interconnection Guideline for RNG projects and the Companies' RNG interconnection proposal, which is supported by KEDNY and KEDLI's GIOP testimonies.

**Q. What does KEDNY propose for its Supply Diversification targets and associated basis points?**

A. KEDNY proposes the following annual Supply Diversification targets and associated basis points for achieving the targets:

| KEDNY Supply Diversification Targets (incremental Dth/yr.) and Basis Points (bps) | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 108,047 | 125,934 | 142,003 | 156,097 | 4 |
| **Target** | 270,118 | 314,836 | 355,007 | 390,244 | 10 |
| **Maximum** | 540,237 | 629,672 | 710,015 | 780,487 | 20 |

**Q. What does KEDLI propose for its Supply Diversification targets and associated basis points?**

A. KEDLI proposes the following annual Supply Diversification targets and associated basis points for achieving the targets:

| KEDLI Supply Diversification Targets (incremental Dth/yr.) and Basis Points (bps) | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 71,606 | 83,856 | 93,617 | 101,619 | 4 |
| **Target** | 179,015 | 209,640 | 234,042 | 254,048 | 10 |
| **Maximum** | 358,030 | 419,280 | 468,083 | 508,096 | 20 |

**Q. How did the Companies calculate their Supply Diversification targets?**

A. Using attributes of the six RNG projects in KEDNY and KEDLI's interconnection queue, the Companies estimated the net benefit per Dth of RNG connected to the natural gas distribution system. Taking this estimated benefit, the Companies then calculated the volume of Dths needed to achieve one basis point of value each year. The Companies believe that connecting RNG results in overall societal benefits and

propose setting the minimum target at one basis point. To establish midpoint and maximum targets, the Companies began by evaluating trends in RNG interconnections from the 1980s to the present and projecting future growth in RNG interconnections between 2020 and 2023 without further action by the Companies. The Companies then developed an estimated trendline for accelerated RNG interconnections to establish the midpoint and maximum targets. Based on the foregoing, the Companies propose a midpoint target of ten basis points, equivalent to a 300 percent improvement in interconnection volumes. The proposed maximum target is capped at 20 basis points or a 500 percent improvement in interconnection volumes.

**Q. What are the benefits associated with the metrics that comprise the System Efficiency EAM?**

A. The Peak Reduction and Supply Diversification metrics align with the Commission's finding that improving overall system efficiency is one of the most important objectives of REV. To that end, the initiatives and strategies the Companies anticipate using to reduce peak and diversify supply will likely result in avoided or deferred capital investment, active customer participation in dynamic load management, reduced energy constraints, and lower carbon emissions. Moreover, the Supply

Diversification metric incentivizes the Companies to increase RNG production volumes through market animation, creating a cleaner and more diverse energy supply, providing a local source of renewable energy that is consistent and reliable, and improving waste management.

### *2. Energy Efficiency*

**Q. Please describe the Companies' Energy Efficiency EAM.**

A. The proposed Energy Efficiency EAM is composed of two metrics: (i) Incremental Energy Efficiency; and (ii) Affordability. In the Commission's REV Track Two Order, the Commission suggested that utilities consider applying the electric EAM approach to establish gas efficiency targets, with comparable EAMs to be considered in gas rate cases. Consistent with the Commission's direction, the Companies propose a program-based Energy Efficiency metric measuring incremental million British thermal units ("mmBtu") reductions, as well as an outcome-oriented Affordability metric measuring percentage reduction in average low-income customer bills.

#### a. Incremental Energy Efficiency

**Q. Please describe how KEDNY and KEDLI will measure the Incremental Energy Efficiency metric.**

A. The Companies propose a program-based energy-efficiency metric measuring incremental mmBtu reductions achieved through the programs described in the Companies' respective ETIP filings. As the Commission noted in the December 2018 EE Order, "[b]ecause increases in utility targets require a lead time to allow vendors and service providers to ramp up capacity, utilities will be granted flexibility in achievement of these targets and expenditure of funds through the full 2019 - 2020 period." With the consideration that utilities should be granted flexibility to align programs with increased targets, the Companies propose that the Incremental Energy Efficiency metric begin in CY 2020 with the first year EAM targets set to account for achievements in CYs 2019 and 2020 collectively. Each year after will consider only achievements against the EAM target in the respective year.

**Q. What does KEDNY propose for its Incremental Energy Efficiency targets and associated basis points?**

A. KEDNY proposes the following annual Incremental Energy Efficiency targets and associated basis points for achieving the targets:

| KEDNY Annual Incremental Energy Efficiency Reduction Targets (mmBtu) and Basis Points (bps) | | | | |
|---|---|---|---|---|
| | **2019 / 2020** | **2021** | **2022** | **2023** |
| **Minimum** | 755,266 (0) | 482,466 (0) | 546,466 (0) | 676,466 (0) |
| **Target** | 1,009,930 (20) | 618,953 (10) | 688,542 (10) | 815,165 (10) |
| **Maximum** | 1,264,594 (40) | 755,439 (20) | 830,617 (20) | 953,864 (20) |

**Q. What does KEDLI propose for its Incremental Energy Efficiency targets and associated basis points?**

A. KEDLI proposes the following annual Incremental Energy Efficiency targets and associated basis points for achieving the targets:

| KEDLI Annual Incremental Energy Efficiency Reduction Targets (mmBtu) and Basis Points (bps) | | | | |
|---|---|---|---|---|
| | **2019 / 2020** | **2021** | **2022** | **2023** |
| **Minimum** | 419,023 (0) | 252,139 (0) | 285,139 (0) | 327,139 (0) |
| **Target** | 544,169 (20) | 314,842 (10) | 347,943 (10) | 380,603 (10) |
| **Maximum** | 669,315 (40) | 377,545 (20) | 410,747 (20) | 434,068 (20) |

**Q. Please explain how the Companies calculated the proposed targets.**

A. The Companies believe the minimum threshold for this metric should be equal to the targets established in the December 2018 EE Order. The targets established in that order reflect a level of utility-specific cost savings to meet the statewide energy savings goal. The Companies therefore propose such targets as the minimum for this EAM metric and assigned them zero basis points. The maximum target was developed by assuming cost efficiencies equal to each company's respective lowest

average historic actual run rate from the last four years, as adjusted for anomalies and to remove behavioral program results. The mid-point target for the metric is set at the mid-point between the minimum and maximum targets.

**b. Affordability**

**Q. Please describe how the Companies will measure the Affordability metric.**

A. The Companies propose an outcome-oriented energy efficiency metric measuring the annual percentage reduction in average low-income customer bills. This metric incentivizes the Companies for programmatic efforts to reduce low-income customers' energy usage and for animating the market for third parties to likewise provide low-income benefits within the Companies' service territories.

**Q. Please explain how the Companies will calculate achievements towards the Affordability metric.**

A. The outcome-based Affordability metric measures reductions in the average monthly customer bill for low-income customers. The Companies will calculate the average monthly customer bill on an annual basis and

compare the year-over-year performance to the weather-normalized baseline from the previous year.

**Q. What do the Companies propose for their respective Affordability targets and associated basis points?**

A. The Companies propose that one basis point be awarded for each 0.2 percent reduction in the average low-income customer bill achieved year-over-year within their respective service territories.

**Q. What are the benefits associated with the Gas Energy Efficiency EAM?**

A. By encouraging increased deployment of gas energy-efficiency through specific measures and other delivery channels described in the Companies' ETIP, the Companies anticipate enhanced customer control of their energy use, market animation, reduced carbon emissions, and increased affordability. Taken together, these benefits support the REV objectives and the State's clean energy goals.

**Q. Did the Companies analyze the benefits and costs of the Energy Efficiency EAMs?**

A. Yes. For the Energy Efficiency EAM, the Companies estimated benefits based on the implied $/Dth numbers from its most recent ETIP filing. Annual costs include those in the Companies' ETIP filings, as well as the incremental cost-shift. Annual net benefits at the target levels are positive as shown in the Companies' ETIP filing.

### *3. Carbon Reduction*

**Q. Please describe the Companies' Carbon Reduction EAM.**

A. The proposed Carbon Reduction EAM is composed of two metrics: (i) metric tons of $CO_{2e}$ reduced from all full-service customers; and (ii) metric tons of $CO_{2e}$ reduced from transportation customers. This metric will focus on the adoption rate of three specific offerings: oil-to-geothermal conversions; sales of RNG via the Green Gas Tariff; and use of compressed natural gas ("CNG") and RNG in NGVs to offset the use of gasoline and diesel.

#### a. $CO_{2e}$ Reduced From Full-Service Customers

**Q. Please describe the full-service Customer $CO_{2e}$ Reduction metric.**

A. Customers that are becoming KEDNY or KEDLI customers will typically be switching their fuel source, usually from delivered fuels to natural gas. This represents a reduction in $CO_{2e}$ for those customers. The Companies have an opportunity to influence those customers when they are making a choice about their fuel switching so that their environmental impact will be further reduced using RNG or geothermal systems. Additionally, the Companies can market to existing customers to encourage them to explore ways that they can reduce their environmental impact, either with RNG or via replacing or supplementing their gas system with a geothermal system. The combined impact of all these customers will be aggregated and will provide a metric to measure how customers are tracking in terms of their environmental impact. By encouraging customers to consider oil-to-geothermal or using RNG rather than traditional fossil-based natural gas, KEDNY and KEDLI will be helping to reduce $CO_{2e}$ emissions.

To calculate the carbon reduction, the volume of natural gas and RNG sold to the appropriate rate classes will be calculated and summed at the end of the calendar year. This sum will be multiplied by the lifecycle $CO_{2e}$ factor for the combustion of fossil-derived natural gas. The resulting number will be the baseline factor for the number of customers and the amount of throughput that would have been expected in the absence of

environmentally beneficial offerings. Next, the $CO_{2e}$ emissions for natural gas and RNG will be calculated separately using the lifecycle $CO_{2e}$ emissions factors for each feedstock. These two will be summed and the resulting value will be subtracted from the first sum calculated above. The delta between these two will represent the carbon reduction achieved via RNG.

To calculate the carbon reduction from geothermal systems, the number of geothermal systems active and owned by each company will be calculated based on the type of customer class they are serving. The number of systems will be multiplied by an average consumption of natural gas for each of these customer classes. The resulting theoretical consumption will be multiplied by the lifecycle $CO_{2e}$ emissions factor for natural gas to determine the amount of avoided carbon emissions via geothermal systems.

The two calculations will be added together to determine the total carbon reduction from all full-service customers.

**Q. How did the Companies calculate basis points for the $CO_{2e}$ metric?**

A. KEDNY determined basis point values by developing a 100-point scale for achieving the carbon reduction target by 2023. To the extent carbon

reductions are achieved at a level above the minimum target, the Companies propose they earn 0.1 basis points for every 232 metric tons of $CO_{2e}$ reduction.

**Q. What does KEDNY propose for its full-service Customer $CO2_e$ Reduction metric rate targets?**

A. KEDNY proposes the following targets:

| KEDNY Annual Full-Service Customer $CO_{2e}$ Reduction Targets | | | | |
|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** |
| **Minimum** | 1,647 | 3,432 | 3,632 | 3,893 |
| **Target** | 2,471 | 5,149 | 5,447 | 5,839 |
| **Maximum** | 3,295 | 6,865 | 7,263 | 7,785 |

**Q What does KEDLI propose for its full-service Customer $CO_{2e}$ Reduction metric rate targets?**

A. KEDLI proposes the following targets:

| KEDLI Annual Full-Service Customer $CO_{2e}$ Reduction Targets | | | | |
|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** |
| **Minimum** | 1,792 | 4,301 | 5,563 | 7,369 |
| **Target** | 2,688 | 6,452 | 8,344 | 11,053 |
| **Maximum** | 3,584 | 8,603 | 11,126 | 14,737 |

**Q. Please describe the transportation $CO2_e$ Reduction metric.**

A. The Companies currently serve CNG fueling stations, which supply fuel for NGVs. By switching from gasoline and diesel to CNG, fleets can

reduce their environmental impact. However, this transition comes with a cost in the form of higher vehicle costs. With continued use of diesel as the business-as-usual scenario, the Companies propose calculating the reduction in $CO_{2e}$ by comparing CNG use to diesel. The Companies believe this calculation is reasonable regardless of whether customers are full-service or work with an energy service company ("ESCO"), because the Companies can determine whether customers are using natural gas for their vehicles. Moreover, if a station signs up to use RNG for a portion of its load, the Companies will also incorporate those savings into the $CO_{2e}$ calculation.

**Q. What does KEDNY propose for its Transportation Customer $CO_{2e}$ Reduction metric rate targets and associated basis points?**

A. KEDNY proposes the following targets and associated basis points:

| KEDNY Annual Transportation Customer $CO_{2e}$ Reduction Targets and Basis Points | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 2,891 | 5,840 | 5,899 | 5,958 | 3 |
| **Target** | 4,337 | 8,760 | 8,848 | 8,936 | 4 |
| **Maximum** | 5,782 | 11,680 | 11,797 | 11,915 | 5 |

**Q. What does KEDLI propose for its Transportation Customer $CO_{2e}$ Reduction metric targets and associated basis points?**

A. KEDLI proposes the following targets and associated basis points:

| KEDLI Annual Transportation Customer $CO_{2e}$ Reduction Targets and Basis Points | | | | | |
|---|---|---|---|---|---|
| | **2020** | **2021** | **2022** | **2023** | **Basis Points** |
| **Minimum** | 2,891 | 5,840 | 5,899 | 5,958 | 3 |
| **Target** | 4,337 | 8,760 | 8,848 | 8,936 | 4 |
| **Maximum** | 5,782 | 11,680 | 11,797 | 11,915 | 5 |

**Q. Please explain how the Companies calculated the targets.**

A. The Companies established the targets based on industry data regarding the adoption rate of renewable offerings that come with a cost premium. The minimum threshold was set at 23,176 metric tons $CO_{2e}$ for CY 2020 given the high cost of renewable energy relative to non-renewable fuels. The target was set 50 percent higher at 34,746 metric tons and the maximum is 100 percent higher at 46,352 metric tons.

**Q. What are the benefits associated with the Carbon Reduction EAM?**

A. The Companies proposed Carbon Reduction EAM promote market activities that will reduce carbon emissions. By adopting the three offerings outlined in this metric, consumers will go beyond the standard level of $CO_{2e}$ reduction that is achieved by switching to natural gas. This

will help to advance the State's and the Companies' goals of reducing statewide greenhouse gas emissions by 80 percent by 2050. Additionally, these offerings will give customers choices, enabling them to participate in a lower-carbon future in a way that fits with their preferences. The Carbon Reduction EAM will also support the use of renewable fuels in the transportation sector and it will animate the market for clean-energy innovation.

**4. *Benefits and Costs***

**Q. Did the Companies analyze the portfolio of benefits and costs associated with its EAMs?**

A. Yes. The Companies evaluated the portfolio of benefits and costs associated with the proposed EAMs. The System Efficiency and Carbon Reduction BCAs are set forth in Exhibit ___ (FOH-2), and the Energy Efficiency BCA is included in the Companies' ETIP filing.

**Q. What did the Companies' analysis of the benefits and costs conclude?**

A. The Companies' analysis concluded that the portfolio of programs and products supporting the EAMs provide significant qualitative and quantitative benefits, including increased customer choice and avoided environmental impacts, in furtherance of State clean energy goals and the

REV objectives. Moreover, the Companies expect the benefits of the respective initiatives to increase as the Companies scale the products and services.

### B. Evaluation and Reporting

**Q. How do the Companies intend to report EAM results and recover incentives?**

A. On March 31 of each year from 2020 to 2024, the Companies will make an annual compliance filing with the Commission in this docket. The annual filing will include a report on the Companies' prior CY performance relative to each EAM target, showing the savings and benefits achieved, as well as calculations for the incentives earned. For metrics where the Companies' performance falls between the minimum and the mid-point target or the mid-point target and the maximum, the incentive payouts will be prorated. The Companies will also provide an explanation of any targets not achieved, if applicable.

**Q. How do the Companies propose to recover any incentive that is earned?**

A. Any incentive that is achieved would be recovered through an EAM surcharge, as explained in the testimony of KEDNY and KEDLI's Gas Rate Design Panels.

**Q. Are the Companies proposing a mid-period review to evaluate the EAMs?**

A. Yes. By March 31, 2022, the Companies will evaluate the EAMs and, in their discretion, file a mid-period review if necessary to suggest regulatory changes and any EAM modifications the Companies believe are appropriate. Any proposed modifications to the EAMs would require Commission approval.

**Q. Are there circumstances when the Companies would seek to modify the EAM proposal before the mid-period review?**

A. Yes. Many of the proposed EAM metrics and associated targets are directly related to products and services supported by this Panel. To the extent the Commission does not approve or otherwise curtails those initiatives, the EAMs proposed may no longer provide meaningful incentives for the Companies, and the associated metrics may therefore require modification.

### C. Platform Service Revenues ("PSRs")

**Q. Are the Companies proposing any PSRs?**

A Yes. The Companies propose two PSRs for revenues from: (i) the E-Commerce Platform; and (ii) the UESC program.

**Q. Please describe the E-Commerce Platform PSR.**

A. Consistent with the REV Track Two Order and the 2017 NMPC Rate Case Order, the Companies propose a PSR sharing mechanism for fees collected by the Companies from vendors who participate in the E-Commerce Platform. During the Rate Year and each Data Year, the Companies propose to retain 20 percent of the fees, deferring the remaining 80 percent for future credit to customers. An example of this mechanism is set forth in Exhibit ___(FOH-9).

**Q. Please describe the UESC program PSR.**

A. During the Rate Year and each of the Data Years, the Companies propose to retain one-third of the fees received from UESC participants, deferring the remaining two-thirds for future credit to customers.

**Q. Why do the Companies believe the UESC sharing mechanism is reasonable?**

A. For the UESC program, unlike the E-Commerce Platform, the Companies are undertaking additional marketing and feasibility management responsibilities without a guarantee that those efforts will result in a contract. Because the PSR would only apply if the initial marketing and feasibility study activities result in customers entering a

UESC with the Companies and moving forward with the improvements identified in the feasibility study, the Companies believe a higher sharing percentage is reasonable. It establishes a meaningful incentive for the Companies to continue to grow the UESC program, while also rewarding customers for the contributions toward marketing and the feasibility studies.

### D. Non-Pipeline Alternatives ("NPA") Incentive Mechanism

**Q. Do the Companies proposing an NPA Incentive Mechanism?**

A. Yes. In support of the NPA proposal discussed in KEDNY and KEDLI's GIOPs' testimonies, and consistent with the "Report of Niagara Mohawk Power Corporation d/b/a National Grid Concerning the Non-Pipeline Alternatives Incentive Mechanism Collaborative" filed December 21, 2018 in Case 17-G-0239, the Companies propose a mechanism for each company to share 30 percent of the difference between the costs of a traditional investment and the proposed cost of an NPA, adjusted for other net benefits. This sharing mechanism follows the basic structure of the non-wires alternative ("NWA") mechanism approved by the Commission in the 2017 NMPC Rate Case. The proposed NPA incentive mechanism is set forth in Exhibit ___ (FOH-11).

## E. KEDLI EmPower Replacement Program Incentive Mechanism

**Q. Is KEDLI proposing to continue the EmPower Replacement Program Incentive Mechanism?**

A. Yes. In the 2016 KEDNY and KEDLI Rate Cases, the Commission approved an earnings incentive mechanism for the EmPower Replacement Program, incentivizing KEDLI to achieve cost savings and promote program participation.

**Q. How is the incentive mechanism structured?**

A. The incentive amount is determined using a percentage of the approved program budget, excluding labor costs, and scaled so that each tier of the program design has a return that reflects the value of participation in that tier. KEDLI is not proposing any modifications to the existing structure of the earnings incentive mechanism.

**Q. How will the incentive mechanism be calculated?**

A. KEDLI proposes the earnings incentive mechanism be awarded annually after all committed projects have been completed and no encumbered funds remain. For each tier, KEDLI recommends applying the same percentages established in the 2016 Rate Case to the annual budget value for calculating the earnings incentive per household served. The

percentages are 0.007 percent for Tier Three and 0.014 percent for Tier Four. The earnings incentive amount per household served is then multiplied by participation in each tier, resulting in a total incentive award to the company. Exhibit ___ (FOH-12) includes an example of the earnings incentive mechanism.

## VII. Conclusion

**Q. Does that conclude the Panel's testimony.**

A. Yes.

**Testimony of the Future of Heat Panel**

## INDEX OF EXHIBITS

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-1)**

# Customer Products, Programs, and Demonstration Project Proposals

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 1**

**Program Title:** Green Gas Tariff

Brief Description:
The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") propose a Green Gas Tariff offering that will enable firm customers the option to incorporate renewable natural gas ("RNG") into their energy portfolios. The Companies have played a leading role in decarbonizing the gas network by interconnecting RNG, including the development of the Newtown Creek Demonstration Project, as well as Standardized Interconnection Guidelines for RNG. With the Green Gas Tariff, the Companies can build on that effort, empowering customers to proactively choose a clean-energy gas portfolio.

The Green Gas Tariff provides customers the opportunity to voluntarily offset some percentage of their natural gas use with RNG. The offering will also serve as a first step in stimulating RNG supplies and developing customer demand. The Companies propose a tiered structure that will allow customers to select a level of RNG purchase that works for their needs, as opposed to requiring customers to fully offset their gas use with more expensive RNG.

The Companies believe different customer types will respond to different tiered structures/pricing. Residential customers tend to prefer price certainty for programs, while commercial and industrial ("C&I") customers tend to prefer costs (and participation) that scale as a percentage of use. To accommodate these customer paradigms, the Companies propose the following tiered structure:

| Tier | Residential Flat Rate | Non-Residential | |
|---|---|---|---|
| | | % of Monthly Consumption | Flat Rate |
| Low | $5/month | 5% | $25/month |
| Low-Middle | $20/month | 10% | $50/month |
| High-Middle | $25/month | 25% | $100/month |
| High | $50/month | 100% | $200/month |
| | | | $500/month |

Any over or under collection from the tiers will be included in the RNG-specific cost of gas, which will affect the future cost of RNG.

Program Justification:
*Meet Customer Desires/Expectations*. A growing number of customers are interested in clean-energy products that reduce their environmental impact. In a recent customer survey 34 percent of residential respondents and 20 percent of Downstate New York commercial respondents indicated that they would be interested in a "green" option for natural gas supply.

*Decarbonize Gas Supply*. RNG is a way to reduce the amount of carbon released from natural gas end-uses. Depending on the source of the RNG (*e.g.*, wastewater treatment plant biogas), it can have a zero or even a negative lifecycle carbon footprint. Incorporating a Green Gas Tariff offering

that enables customers to choose RNG, allows gas customers to leverage their existing systems to reduce their carbon footprint. The Green Gas Tariff also supports the State's clean energy goals, and it is consistent with National Grid's *Northeast 80x50 Pathway*.

*Support RNG development in NY*. A large portion of RNG is produced from agricultural waste, often providing a valuable source of income and fuel for agricultural producers. Developing a Green Gas Tariff offering will also help RNG project developers will feel more confident investing in RNG projects by establishing a proven end-use market.

*Support Non-Pipes Alternatives ("NPAs")*. RNG is a feasible source of supply for NPA projects. Having a mechanism in place by which consumers could pay for RNG would ensure accurate accounting for all customers.

Program Cost Breakdown:
The Companies propose two full-time equivalents ("FTEs"), one for each company, to administer the Green Gas Tariff program beginning in Data Year 1 (year ending March 31, 2022). This work will include procuring green gas supplies, acquiring and selling environmental attributes, tracking and managing green gas system entries, and program reporting. For KEDNY, the costs include $0.157 million in Data Year 1, $0.162 million in Data Year 2, and $0.164 million in Data Year 3. For KEDLI, the costs include $0.163 million in Data Year 1, $0.167 million in Data Year 2, and $0.170 million in Data Year 3. The Company further proposes that the costs for the Green Gas Tariff offering would be borne by the customers who elect to participate in the program.

Supply Implications:
RNG tends to enter the market because of large, capitally intensive projects. Similar to interstate pipelines, which are not built unless they are fully committed, RNG projects generally proceed only once they are assured customers. The nature of this supply market may mean that there is a mismatch between the procured supply and the amount delivered to participating customers. This condition is exacerbated in the early years of the tariffed offering as the base of customers is likely to be small.

To address the potential mismatch between supply and demand, the Companies propose establishing a separate gas adjustment clause ("GAC") for managing the costs of RNG. This will allow the Companies to maintain an accurate cost of RNG in isolation from the cost for traditional gas. In the case of over-supply, the Companies will be able to sell the excess gas, and, if applicable, monetize any incentives related to the environmental attributes of RNG (*e.g.*, Renewable Identification Numbers or Renewable Energy Credits). The net financial impact would be included in the GAC to reduce the cost of RNG for participating customers.

Alternatives
- RNG marketplace to match suppliers with large consumers, limiting consumption to those large enough to be anchor customers for RNG development projects.
- Work with energy service companies to support transportation customers.

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 2**

**Program Title:** Utility Energy Service Contracts ("UESCs")

Brief Description:

Since 2011, The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") and their National Grid USA Service Company, Inc. ("National Grid") affiliates have used the Utility Energy Service Contract ("UESC") program to assists government agencies and other large commercial customers in achieving energy improvements. UESCs allow the Companies and their customers to enter a limited-source contract, wherein the Companies provide comprehensive behind-the-meter energy and water improvement services. In New York alone, the Companies and their affiliate, Niagara Mohawk Power Corporation d/b/a National Grid ("NMPC") have delivered $18 million in value for federal and state facilities.

Following these past successes, the Companies propose to expand the UESC program in the KEDNY and KEDLI service territories, adding feasibility-study incentives and including additional marketing efforts to drive energy savings, carbon reductions, and further animate the market for new clean energy technologies. In addition to the proposed incentive, the program costs include two full-time equivalents ("FTEs") to oversee marketing and engineering and a dedicated outreach budget.

Program Justification:

*Expand on customer success from current program.* The Companies and NMPC have partnered with industry-leading companies, including conEdison Solutions, Constellation Energy, Energy Systems Group, and SmartWatt, to deliver $18 million in UESC savings to customers. The Companies believe they can build on that effort with incentives for energy feasibility studies and increased marketing.

*Meet energy efficiency targets.* The Clean Energy Standard (CES) and Executive Order 88 mandates a twenty percent reduction in Source Energy Use Intensity at State facilities by April 2020. Likewise, federal laws including EPACT 1992 (42 U.S.C. §8256), the National Defense Authorization Act of 2007 (10 U.S.C. §2913), Federal Acquisition Regulation Part 41, EISA 2007 (42 U.S.C. §432), and Presidential Memorandum – Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Services, all support the use of UESCs to reduce customer load profiles and advance federal clean energy policies. To that end, the Companies and their National Grid affiliates executed a federal Areawide Public Utility Contract on February 6, 2012, providing for, *inter alia*, the execution of UESCs between the federal government and the Companies.

*Create a market for emerging clean energy technologies.* The existing UESC program focuses on energy efficiency measures. With declining costs and increasing interest in distributed generation and other on-site energy management technologies, the Companies will include emerging technologies such as energy storage, combined heat and power, and geothermal.

*Adhere to REV principles.* The UESC model allows for the utility to play the role as trusted energy advisor for its customers while animating third-party markets.

Program Costs
National Grid is requesting recovery for hiring two new FTEs to support the program, creating a marketing budget, and offering customers incentives to reduce the cost of the initial engineering feasibility study.

*Increase in FTEs:* The Companies propose to hire a marketing manager and a project engineer to expand the reach of the program and assist participating customers through the feasibility study and implementation process.

*Increase in the Marketing Budget:* There are three components to the proposed marketing budget: an initial outreach budget for materials to generate leads; a general budget to cover the cost of outreach, sales, and materials; and a budget for running a procurement process for financing options.

*Incentives for Feasibility Study:* Part of the UESC process includes a feasibility study that identifies the project opportunities for the customers and estimates costs and savings potential. The study is typically funded by the customer. To ease the burden on the customer and increase uptake, the Companies propose to provide an incentive that will cover fifty percent of the cost of any study above $10,000. The studies typically cost around $100,000, with the Companies anticipating approximately $25,000 to $50,000 in incentives per participating customer. The incentive will not apply to customers who receive feasibility study assistance as part of other programs, such as offerings from the New York State Energy Research and Development Authority.

The Companies forecast the following UESC program costs:

| Company | Rate Year | Data Year 1 | Data Year 2 | Data Year 3 |
|---|---|---|---|---|
| ***KEDNY*** | | | | |
| Labor & Overheads ($000's) | $119.8 | $122.4 | $125.9 | $127.9 |
| Non-Labor ($000's) | $137.5 | $332.5 | $470.0 | $560.0 |
| FTE Count | 1.0 | 1.0 | 1.0 | 1.0 |
| ***KEDLI*** | | | | |
| Labor & Overheads ($000's) | $123.9 | $126.6 | $130.4 | $132.3 |
| Non-Labor ($000's) | $137.5 | $332.5 | $470.0 | $560.0 |
| FTE Count | 1.0 | 1.0 | 1.0 | 1.0 |

Platform Service Revenue ("PSR")
The Companies propose a PSR for any fees received from UESC participants, split one-third to the Companies and two-thirds deferred for credit to customers.

Customer Benefits:

Customers who participate in the UESC program benefit by:

- A limited-source contract vehicle that meets public procurement process requirements

- Reduced energy costs
- Meeting energy and greenhouse gas goals
- Obtaining low cost third-party financing for projects from public and private sources
- Working with a knowledgeable and trusted partner

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 3**

**Program Title:** Fuel-Switching Calculator

Brief Description:

The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") propose developing a web-based fuel-switching calculator to inform customers about the costs of various energy options. The calculator, similar to one developed by Central Hudson Gas and Electric Company,[1] will use the customer's existing energy usage and load profile, mechanical system, as well as location to produce cost and emissions estimates for different energy alternatives (*e.g.*, geothermal, cold-climate air-source heat pumps ("ccASHP"), renewable natural gas ("RNG"), etc.). The calculator will also provide estimated conversion costs for the energy alternatives, including available incentives.

The side-by-side comparison will enable consumers to take an active role in supporting the transition to a sustainable energy future. The Companies believe that through such energy insights customers will discover how they can use low-carbon solutions (*e.g.*, RNG, geothermal) at a reasonable cost. This, in turn, may lead to increased adoption of low-carbon products and services in support of the State's clean energy goals.

Program Justification:

*Meet Customer Expectations.*
Customers expect their utility, as a trusted energy resource, to make energy information more transparent and accessible. Indeed, one of the Commission's key Reforming the Energy Vision ("REV") policy objectives is to "enhance[] customer knowledge and tools that will support effective management of their total energy bill." The proposed fuel-switching calculator will accomplish this purpose, enabling customers to evaluate the pros and cons of energy alternatives and empowering them to more effectively manage their energy bill.

*Decarbonize Gas Supply*.
To meet the State's clean energy goals, the Companies believe it is key to adopt energy sources, such as RNG, that have lower lifecycle carbon intensity. The fuel-switching calculator will provide customers with information about such options like the Companies' proposed Green Gas Tariff offering, which would allow customers to purchase RNG to meet a portion of their energy needs. The RNG pricing in the Green Gas Tariff will be included in the calculator. With this information, customers will be able to evaluate the annual cost impact and make informed decisions as to how they can best support the decarbonization of the gas supply network.

*Support RNG development in NY*.
New York has a sizable amount of organic feedstock that can be used to produce RNG (*e.g.*, wastewater, agricultural waste, food waste). By creating a market for RNG through increased information and energy procurement options, developers will be able to count on a reliable demand for their product. This certainty will help them make investments in RNG production facilities, providing multiple benefits including: reduced waste streams, additional revenue for producers,

[1] https://www.cenhud.com/myenergy

local jobs, increased local gas supplies, potential non-pipeline alternatives ("NPAs"), and reduced distances that fuel needs to travel before it is consumed.

*Support NPAs*.
NPAs may provide a cost-effective way to serve new customers or to defer and delay traditional projects. Without access to natural gas, and in the absence of clear information about viable energy alternatives, customers may continue to use higher emitting energy system. The fuel-switching calculator will allow customers to analyze the cost of various NPA technologies and make informed decisions about how such energy alternatives may be able to meet their energy needs.

Program Cost Breakdown:

The fuel-switching calculator proposal includes incremental O&M of $0.125 million for KEDNY and KEDLI in the Rate Year, and $0.018 million for the Companies in each of the Data Years. These amounts cover the costs to develop and maintain the web-based calculator.

Customer Benefits
The fuel-switching calculator will serve as an accessible resource for customers looking to take more control over their energy usage. By providing additional information about alternative energy options, the calculator will help animate the market for third-party products and services, such as RNG. And, in turn, it will help to drive down carbon emissions consistent with the State's clean energy goals and the REV objectives.

Alternatives

- Continue without a fuel-switching calculator, performing calculations on an ad-hoc basis.
- Direct customers to a calculator created by another organization, which may or may not include information relevant to New York in general, or to the Companies proposed offerings (*e.g.*, Green Gas Tariff) more specifically.

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 4**

**Program Title:** Natural Gas Vehicle ("NGV") Rate Modernization

Brief Description:
The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") propose to modernize gas delivery rates for NGVs. National Grid has long maintained rates for the sale of compressed natural gas ("CNG") for NGVs consistent with the Public Service Commission's guidance in Case 92-M-0451. To advance the State's clean energy goals by decarbonizing the transportation sector and animating the market for renewable natural gas ("RNG") the Companies propose two modifications to their current approach:

1) Updating conventional rates (SC-4A-CNG and SC-17-CNG for KEDNY and SC-5(807) and SC-9(800) for KEDLI), moving them toward a unit-savings goal of approximately $1 per Gasoline Gallon Equivalent ("GGE") on an annual basis; and

2) Offering customers the option to choose firm service or non-firm interruptible service (full or partial) at project inception.

Some NGV rates were designed to be firm delivery rates with market-based pricing, approximately fixing the savings compared to gasoline or diesel. The rate structure was designed when fuel price advantage was smaller and the technology of the NGV market was less mature. However, due to the faster decline in the commodity cost of natural gas versus petroleum fuels, this rate structure has resulted in high-cost NGV rates, specifically on Long Island. The Companies propose to monitor market conditions and petition the Commission to update the NGV rates if the market warrants an adjustment.

Program Justification:

*Meet Customer Expectations*. Fleet owners considering NGVs are often focused on the economics of changing their fuel source. Vehicle costs, the associated maintenance requirements, and CNG fuel prices all play a critical role in a customer's NGV decision. By ensuring fuel costs are appropriate and predictable, the Companies can help customers evaluate the NGV options and animate the CNG market.

*Decarbonize Gas Supply*. NGVs have historically been one of the main end-use markets for RNG. This stable demand has helped developers bring additional RNG projects online, increasing RNG supplies and decreasing costs. Modernizing the NGV rates should help to advance efforts to decarbonize the gas supply.

*Provide options for fleet operators*. NGVs have a long track record of delivering fleet operators reduced emission profiles and quality performance in a variety of conditions. The use of RNG, as enabled by the Companies' proposals, may provide a further option for fleet operators to lower their emission profiles.

Program Cost Breakdown:

The proposal modifies existing NGV rates, with no incremental cost to complete the work. Initially, the proposed changes may result in a decrease in revenue due to decreases in NGV sales. However, such decreases are likely to be offset by increased NGV sales due to the implementation of more competitive rates.

Customer Benefits

The Companies believe modernizing the NGV rates will increase NGV sales in the long run, reducing carbon emissions and potentially enabling the growth of RNG use in the transportation sector. In addition, by including an interruptible offering and allowing CNG developers to participate in the Demand Response Demonstration Project, the Companies believe they can enhance reliability and achieve peak gas demand reductions without increasing emissions, as the fueling stations often include on-site storage and vehicle fueling schedules can usually be temporarily adjusted with little or no disruption to fleet operations.

Alternatives

- Status quo.
- New NGV rates based on different rate levels.
- Adopt NGV rates similar to National Fuel's NGV Program, which includes on-bill financing of $1.0 million per station and deferral of distribution revenue.

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 5**

**Program Title:** Demand Response Demonstration Project

Brief Description:
The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") propose to expand the Demand Response Demonstration Project (the "Project") approved as part of the 2016 KEDNY & KEDLI Rate Case.[1] The Project, as originally approved, has demonstrated that customers are willing to modify their gas consumption in response to price signals. The proposed expansion builds on the Project's initial success to evaluate the reliability and replicability of calling demand response events to achieve meaningful system relief from firm customers during peak events. Understanding aggregate system impacts will enable the Companies to better understand the role demand response can play as a system management or planning tool. Specifically, expanding the Project will allow the Companies to assess the balance between incentive payments, penalty levels, and customer participation.

As part of the expanded Project, the Companies propose the following targets and eligibility requirements:

Program Target – shaving aggregate demand during peak periods by 1 percent. For the Companies, this would require:

- KEDNY: a reduction in net demand by 1,000 Dth/hour by fiscal year ("FY") 2024 for the duration of peak events.
- KEDLI: a reduction in net demand by 400 Dth/hour by FY 2024 for the duration of peak events.

Eligibility – Participating customers must meet a minimum annual demand value, provide a minimum reduction value, and receive firm gas delivery. For the Companies, this would require:

- KEDNY: customers must consume at least 4,000 Dth/year and commit to reduce demand over the duration of an event by at least 3 Dth/hour.
- KEDLI: customers must consume at least 6,000 Dth/year and commit to reduce demand over the duration of an event by at least 3 Dth/hour.

The Companies will notify participating customers in advance of an event, and they will establish a tracking system to ensure recipients have received the notifications. Customers who choose to participate in the Project will be responsible to react to all notifications, reducing their gas demand by a pre-agreed upon minimum reduction value (Dth/hour) for the entire duration of each peak event – this is critical as the Companies will not have control over customer systems or equipment. To verify customer participation, the Companies will have access to interval meter data.

[1] Cases 16-G-0058 and 16-G-0059, Proceeding on Motion of the Commission as the Rates Charges, Rules and Regulations of Keyspan Gas East Corporation d/b/a National Grid and The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service (the "2016 KEDNY & KEDLI Rate Case").

Participating customers who reduce their gas demand will receive a fixed incentive each year for subscribing to the Project. To further encourage demand reductions, the Companies will also provide incentives to customers based on the volume of demand reduced during peak events. Customers who fail to respond during peak events will incur penalties that exceed the incentives, and those customers who fail to make such reductions during a predetermined number of events per winter season may ultimately be removed from the Project. The Companies will scale the incentives and penalties based on the customer's agreed upon minimum reduction value.

Program Justification:
The Project was designed to test customer willingness to participate and reduce energy usage during peak periods. The expanded Project is designed to explore aggregate system impacts, leading to better understanding of how demand response can be scaled as a system management and planning tool. In addition to collecting data, the expanded Project is also designed to meaningfully reduce gas demand during peak periods – approximately 1 percent of estimated peak send out – and to answer the following questions:

- What magnitude of the net demand reduction can customers provide during a peak event?
- How reliable and repeatable are net reductions during events?
- What incentive and penalty levels encourage optimal participation and minimize costs?

Project Costs:
For KEDNY, the capital costs of the Demand Response Demonstration Project are $0.236 million in FY 2020 and $0.059 million each in the Rate Year and Data Years 1 and 2. For KEDLI, the capital costs of the Demand Response Demonstration Project are $0.107 million in FY 2020 and $0.027 million each in the Rate Year and Data Years 1 and 2.

The Companies also include operation and maintenance ("O&M") costs to cover the incentives, demand response software, and FTEs who will administer the expanded Project. For KEDNY the incremental O&M is $1.320 million in the Rate Year, $1.638 million in Data Year 1, $1.962 million in Data Year 2, and $2.326 million in Data Year 3. For KEDLI, the revenue requirement includes incremental O&M of $0.628 million in the Rate Year, $0.772 million in Data Year 1, $0.921 million in Data Year 2, and $1.112 million in Data Year 3.

Anticipated Benefits:
The expanded Project is expected to result in economic and environmental benefits, including reduced customer energy costs and avoided $CO_2$ emissions. While the actual benefits achieved will depend on how participants respond to peak events, the Companies estimate the Project will result in the following benefits:

- Net energy cost reduction for participants: $613,000 in KEDNY and $228,000 in KEDLI.
- Net avoided $CO_2$ emissions: $47,000 in KEDNY and $21,000 in KEDLI.

The Companies will also gather data on the reliability, repeatability and scalability of demand response offerings for firm customers. This information will enable the Companies to evaluate demand response offerings as a system management and planning tool, which may ultimately result in increased reliability and resiliency of the system and the ability to count on demand

response as an NPA. Demand response also has the potential to create supply-side value by enabling the Companies to manage load and operate within supply contract limitations.

Alternatives Considered

1. Seek to continue the current commercial demand response demonstration project.
2. Use time-of-use rates to achieve the same level of customer behavioral change.
3. Propose to scale the demand response demonstration project upon completion of the current demonstration project.
4. Residential demand response (*e.g.*, water heaters).
5. Pursue a dual-fuel firm rate proposal, as suggested by the Companies' customer Estates, LLC, which is similar to the Demand Response Demonstration Project.

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

**Schedule 6**

**Program Title:** Sustainable Heat Initiative

Brief Description:
The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") proposal a multi-faceted Sustainable Heat Initiative providing customers with lower carbon energy options to meet their heating needs. The initiative involves three specific programs aimed at giving customers more control over their energy usage and advancing the State's clean energy goals:

- An expanded Geothermal Demonstration Project;
- A Clean Conversions Program, Prioritizing Renewable Natural Gas ("RNG"); and
- A Low-to-Moderate Income ("LMI") Oil-to-Gas Conversion Program

**Expanded Geothermal Demonstration Project**

In the 2016 KEDNY & KEDLI Rate Case, the Public Service Commission (the "Commission") approved a geothermal demonstration project, where the Companies proposed test the use of a shared-loop design geothermal system. Portions of the geothermal system are analogous to the structure of a gas distribution network; as such, demonstrating the geothermal technology enabled the Companies to leverage their expertise in operating underground energy systems. The geothermal system installed as part of the demonstration was in a community that does not have access to natural gas. Customers responded favorably to the new system, which performed with high coefficients of performance ("COP"), even during challenging weather conditions.

The Companies believe they can build on the initial success of the demonstration through utility ownership of the ground-loop portions of the geothermal systems. This ownership model may achieve cost reductions by leveraging the Companies' scale and purchasing power. The goal of expanding the demonstration project is to reduce the overall system costs for the market enabling more customers to adopt highly efficient geothermal technology. With this expanded demonstration approach, the Companies will own the ground-loop portion of the geothermal systems, while working with vendors to provide options for participants to obtain the above-ground portions of the system. If this model proves successful, the Companies may petition the Commission for approval to scale the project.

Project Justification:
*Reduce the cost of heat pumps for all market participants*. National Grid will help to reduce the installed cost of geothermal systems by increasing the number of systems that are installed each year and bringing buying power into the market. Natural gas utilities can draw upon their expertise of installing and maintaining underground energy assets, leveraging economies of scale, to reduce the cost for customers and to accelerate adoption of geothermal technology.

*Support state and company goals*. The State has a goal of achieving 5 Tbtu of energy reduction through the installation of heat pumps. The Companies believe they can play an important supporting role in meeting this target by investing in these assets, specifically those that enable customers to use higher-COP geothermal systems rather than air-source heat pumps.

*Provide Options for Customers Not Served by the Gas Network*. Customers who are outside the natural gas network do not benefit from the same access to lower-carbon fuel sources as those who have access to natural gas6. Often such customers must rely on a less-clean option like oil to meeting their heating requirements. The expanded Geothermal Demonstration Project provides options to those customers.

*Non-Pipe Alternatives ("NPAs").* Geothermal systems provide a non-traditional way to serve customers outside the existing natural gas network. Doing so not only helps to satisfy the customer's needs, but it serves as a NPA, delaying or deferring traditional infrastructure investments and reducing peak load.

Project Costs

The expanded Geothermal Demonstration Project includes incremental operations and maintenance ("O&M") costs to cover the ground loops, marketing, and the FTEs who will manage the portfolio of installations. For KEDNY the projected O&M costs are $0.216 million in the Rate Year, $0.326 million in Data Year 1, $0.500 million in Data Year 2, and $0.633 million in Data Year 3. For KEDLI, the revenue requirement includes incremental O&M of $0.980 million in the Rate Year, $1.896 million in Data Year 1, $3.293 million in Data Year 2, and $4.287 million in Data Year 3. The costs include the addition of one FTE in the Rate Year split between KEDNY and KEDLI, increasing to an additional two FTEs in Data Year 2 and Data Year 3 split between KEDNY and KEDLI. The FTEs will manage the geothermal installations, coordinating requests for proposal ("RFPs"), contacting project coordinators, and ensuring the increased electric load will not cause adverse impacts for the electric utility serving areas where the Companies have installed geothermal systems.

Target Market:

The expanded Geothermal Demonstration Project will focus on meeting the heating needs of low-to-moderate income ("LMI") and commercial and industrial ("C&I") customers – the market segment where utility ownership is likely to create the largest amount of value. Furthermore, the project will target customers that are outside the existing and planned gas network (*i.e.*, greater than 200 feet from an existing gas main).

Customer Relationships:

Customers who sign up for the project will receive either the ground-loop (*i.e.*, below-ground components) or the total system (*i.e.*, ground-loop plus above-ground components). The Companies will contract with market vendors, as part of the

demonstration project, to install the systems. Customers will pay a fixed monthly payment for this service in addition to their electric utility payment. If the customer elects to work with a different partner for the installation of the above-ground assets (*i.e.*, the Companies only own the ground-loop), the Companies will coordinate with the customer's chosen vendor-partner to ensure a seamless customer relationship.

Additionally, the Companies may offer energy efficiency incentives to customers provided that the financial impact of the incentive is offset by the impact on the cost of the ground-loop system (*i.e.*, if the ground loop cost drops by 10 percent due to an energy efficiency initiative, the Companies may offer up to that same amount as an incentive).

**Clean Conversions Program**

For KEDLI customers outside the existing gas network who do not (or cannot) participate in the expanded Geothermal Demonstration Project, the company proposes the Clean Conversions program. Clean Conversions, formerly the Neighborhood Expansion Program, ensures that customers who want to convert to a cleaner fuel are afforded the option to make a cleaner heating choice. Using the proposed web-based fuel-switching calculator, customers who participate in the Clean Conversions program will be provided cost information for all available energy alternatives, including geothermal, RNG, and natural gas, among others. KEDLI will encourage customers to consider RNG when applying for the Clean Conversions program, as RNG may be less expensive than the customer's current fuel options.

Over time, KEDLI proposes to reduce the scope of the Clean Conversion program as the expanded Geothermal Demonstration Project gains customers. In addition, the company will no longer proactively pursue customer participation, as had been the practice under the Neighborhood Expansion Program. The density and minimum customer connections requirements that were used under the prior program will, however, remain the same as those approved in Case 14-G-0214.

Project Justification

KEDLI expects significant customer and societal benefits from the Clean Conversions program, including customer energy savings, reduced carbon emissions, and the displacement of millions of gallons of oil. The Clean Conversions program will serve as a transitional program to address customer interest in converting to lower carbon resources while the Companies continue their demonstration projects and seek additional non-pipes alternative ("NPA") project proposals. To that end, KEDLI proposes the following reductions in mains and services as compared to its fiscal year 2020 plan:

| | FY20 | FY21 | FY22 | FY23 | FY24 |
|---|---|---|---|---|---|
| Gas Footage | 125,000 | 110,000 | 95,000 | 80,000 | 65,000 |
| Gas Services | 630 | 555 | 479 | 403 | 327 |
| Geo Installs | - | 68 | 135 | 248 | 360 |

*Conversions.* KEDLI's forecast shows steady demand in the residential conversion market due to low natural gas prices compared to oil. The commercial conversion market is forecasted to decrease slightly due to market saturation and fewer large project opportunities. Changes in the sales mix to mostly residential conversion projects will require more capital spending per new customer. Overall, the gas price advantage will increase from 2020 to 2023 and this will provide continued demand for gas.

*New Construction*. Moody's is forecasting an increase in new construction activity which will increase demand for new gas service from 2020 to 2023. Single family housing starts are expected to increase. Multi-family housing starts have cooled after spiking in 2017 but are expected to rise again beginning in 2020. Non-residential construction is expected to fall.

Program Costs:
The Clean Conversions program will provide support to meet the anticipated customer demand for a three-year period as follows:

| **CAPEX $000** | **FY20** | **FY21** | **FY22** | **FY23** | **FY24** |
|---|---|---|---|---|---|
| Services | 5,551 | 5,400 | 5,304 | 5,228 | 5,152 |
| Main Footage | 266,475 | 274,500 | 241,100 | 205,000 | 190,000 |
| Base Growth - Install Main | $ 16,946 | $ 21,495 | $ 18,535 | $ 14,940 | $ 15,259 |
| Base Growth - Install Services | $ 26,074 | $ 26,455 | $ 26,732 | $ 27,266 | $ 27,812 |
| Base Growth - CCP Main | $ 23,125 | $ 20,790 | $ 18,314 | $ 15,731 | $ 13,037 |
| Base Growth - CCP Services | $ 5,582 | $ 4,769 | $ 4,198 | $ 3,602 | $ 2,982 |
| Base Growth - Customer | $ (4,219) | $ (4,300) | $ (2,500) | $ (2,500) | $ (2,500) |
| Base Growth – Install | $ 836 | $ 861 | $ 1,067 | $ 1,104 | $ 1,143 |

**LMI Oil-to-Gas Conversion Program**
The Companies will attempt to serve LMI customers as part of the expanded Geothermal Demonstration Project. However, as with the Clean Conversions program, for those LMI customers who do not (or cannot) participate in the Geothermal Demonstration Project, the Companies will continue to provide incentives to qualified residential customers to convert their heating and hot water systems from oil or propane to natural gas. Beginning in 2020, the Companies propose expanding the existing incentive program for income-eligible customers to all qualified LMI customers, delivering more benefits and achieving great carbon reductions through the expanded offering. Customers will likewise benefit from lower energy bills and reduced carbon emissions. The proposed changes to the program include:

- The Companies will extend eligibility criteria to moderate income customers, defined as 60 percent to 80 percent of State or area median income, whichever is higher.

- To create efficiencies and increase program effectiveness, the Companies will utilize an implementation vendor to help identify customers; provide customer intake, income screening and verification; process applications; perform inspections; schedule services and coordinate other services to provide a more seamless customer experience.

- The Companies aim to encourage and incentivize the installation of high-efficiency heating and hot water systems rather than standard efficiency wherever possible.

- KEDLI will coordinate with the EmPower Replacement Program (HEAT), local agencies and other energy efficiency programs to provide smart thermostats, weatherization services and water saving measures to further reduce customer energy costs.

- KEDNY will coordinate with NYSERDA, local agencies and other energy efficiency programs to provide smart thermostats, weatherization services and water savings measures to further reduce customer energy costs.

- To ensure the health and safety for its customers, the Companies will also coordinate their work with the proposed residential methane and carbon monoxide detector initiative.

Project Costs:

**KEDNY and KEDLI LMI Oil-to-Gas Conversions Budgets**

| | KEDNY | KEDLI |
|---|---|---|
| Budgets Per Region | $ 1,600,000 | $1,800,000 |
| Admin Fee 25% | $ 400,000 | $ 450,000 |
| Incentives | $1,200,000 | $1,350,000 |
| Average incentive per customer | $12,000 | $10,000 |
| Estimated number of customers served | 100 | 135 |

Benefits:

The Companies estimate new gas service connections resulting in will have positive economic benefits and environmental impacts through reduced emissions and the displacement of significant volumes of oil, as well as lower energy bills.

Alternatives

- Change the tariff to increase Contributions in Aid of Construction.
- Amend the tariff to require smaller customers to pay for necessary reinforcements to provide service.

**Testimony of Future of Heat**

**Exhibit ___ (FOH-1)**

Schedule 7

**Program Title:** Research, Development, and Demonstration ("RD&D")

Brief Description:
Following their last rate case, The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") participated in end-use-related RD&D as members of the Gas Technology Institute's ("GTI") Utilization Technology Development ("UTD") program. The UTD program is a national collaborative that supports research in advanced gas technologies, such as heating and cooling, distributed generation, and natural gas vehicles ("NGVs") – areas that are generally ineligible for funding through the Millennium fund.

In addition to the UTD program, the Companies participated in the Institute of Gas Innovation and Technology ("I-GIT") at Stony Brook University's Advanced Energy Research and Technology Center ("AERTC"). This end-use research institute formally opened in February 2018, with the Companies providing an initial non-ratepayer contribution of $100,000 to help launch the effort. In the last year, I-GIT added one full member, the Coalition for Sustainable Energy ("CSE") based in San Diego, and several more organizations are considering membership. I-GIT identifies and supports collaborative solutions to today's energy challenges. Importantly for the Companies, I-GIT focuses on research areas not adequately addressed by the UTD program, such as integrating renewable natural gas ("RNG") and hydrogen, as well as other non-pipeline alternatives ("NPAs"). The Companies propose to continue their memberships in both the UTD program and the I-GIT.

Program Justification:
*Supports new, highly efficient end-use technology*. The Companies participation in the UTD program has supported new product offerings, including highly efficient heating systems (***i.e.,*** the "Superboiler"). Recently, the UTD program also supported the Thermolift, a thermally activated heat pump developed by AERTC. The Thermolift exceeded its performance objectives in tests by the U.S. Department of Energy. I-GIT has led the technical support efforts of a coalition of New York farmers to enable and promote the production of RNG and injection into the gas distribution systems. These efforts resulted in the New York State Energy Research and Development Authority ("NYSERDA") funding for RNG.

*Foster collaboration with academic/research institutions*. By remaining connected with institutions focused on research, the Companies can abreast of the latest developments while bringing value to the research institutions in the form of expertise and real-world analysis.

Program Costs:
Costs for program membership and continued support of I-GIT is incremental operations and maintenance ("O&M") costs of $0.050 million per year for each company over the four-year rate plan. In addition, the Companies propose to continue their membership in the UTD program. The UTD costs are captured in the historic test year, at an annual cost of $0.175 million per year.

Alternatives
- Rely solely on manufacturers as a source of research and development, as envisioned by the Millennium order.
- Rely on the market for research and development.

# Testimony of the Future of Heat Panel

## Exhibit ___ (FOH-2)

## Benefit-Cost Analyses

**Testimony of Future of Heat**

**Exhibit ___ (FOH-2)**

Schedule 1

KEDNY
System Efficiency Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV($MM) |
|---|---|---|
| Benefits | Total | $43.34 |
| | SCT | $43.34 |
| | UCT | $0.00 |
| | RIM | $0.00 |

| | | |
|---|---|---|
| Costs | Total | $15.64 |
| | CapEx split | $3.48 |
| | O&M split | $12.16 |
| | SCT | $15.64 |
| | UCT | $15.64 |
| | RIM | $15.64 |

| | | |
|---|---|---|
| Cost-Effectiveness Tests | SCT Ratio | 2.77 |
| | UCT Ratio | 0.00 |
| | RIM Ratio | 0.00 |

| Category | Benefit/Cost | SCT | UCT | RIM | NPV($MM) | % of total |
|---|---|---|---|---|---|---|
| Benefit | Net Avoided CO2 | Y | N | N | $42.79 | 98% |
| | Net Avoided Energy Costs | Y | N | N | $0.67 | 2% |
| | Reliability/Resiliency* | Y | N | N | $0.00 | 0% |
| | Avoided Water Impacts* | Y | N | N | $0.00 | 0% |
| | Avoided Land Impacts* | Y | N | N | $0.00 | 0% |
| | TOTAL BENEFITS | $43.46 | 0 | 0 | $43.46 | |
| Cost | Program Implementation Costs | Y | Y | Y | $8.75 | 56% |
| | DR Performance Payments | Y | Y | Y | $6.90 | 44% |
| | TOTAL COSTS | $15.64 | $15.64 | $15.64 | $15.64 | |

System Efficiency Benefit Cost Analysis Detail

| System Efficiency Benefits ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) | |
|---|---|---|---|---|---|---|---|---|---|
| Net Avoided CO2** | CY 19-23 | $0.00 | $17.62 | $20.91 | $23.99 | $26.82 | $89.34 | $42.79 | ** |
| Net Avoided Energy Costs | CY 19-23 | $0.09 | $0.12 | $0.14 | $0.16 | $0.16 | $0.67 | $0.55 | |
| Total Benefits | CY 19-23 | $0.10 | $17.74 | $21.05 | $24.15 | $26.98 | $90.02 | $43.34 | |

| System Efficiency Costs ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) | |
|---|---|---|---|---|---|---|---|---|---|
| Program Implementation Costs | | | | | | | | | |
| RNG Interconnection CapEx | CY 20-23 | | $0.90 | $0.90 | $0.90 | $0.90 | $3.60 | $3.11 | |
| RNG Interconnection OpEx** | CY 20-23 | | $2.20 | $2.20 | $2.20 | $2.20 | $8.80 | $4.68 | ** |
| DR CapEx | CY 19-23 | $0.24 | $0.06 | $0.06 | $0.06 | | $0.41 | $0.37 | |
| DR OpEx | CY 19-23 | $0.10 | $0.10 | $0.10 | $0.20 | $0.20 | $0.71 | $0.58 | |
| DR Performance Payments | CY 19-23 | $0.98 | $1.47 | $1.79 | $2.05 | $2.11 | $8.39 | $6.90 | |
| Total Costs | CY 19-23 | $1.31 | $4.73 | $5.05 | $5.41 | $5.41 | $21.92 | $15.64 | |

*Qualitative benefit not calculated and included in BCA
**NPV calculated based on a 20 year life of investment. A project connected in CY19 generates 20 years of CO2 reductions and 20 years of O&M

**Exhibit____(FOH-2)**

Schedule 2

KEDLI
System Efficiency Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV($MM) |
|---|---|---|
| Benefits | Total | $27.69 |
| | SCT | $27.44 |
| | UCT | $0.00 |
| | RIM | $0.00 |

| | | |
|---|---|---|
| Costs | Total | $7.51 |
| | CapEx split | $1.71 |
| | O&M split | $5.80 |
| | SCT | $7.51 |
| | UCT | $7.51 |
| | RIM | $7.51 |

| | | |
|---|---|---|
| Cost-Effectiveness Tests | SCT Ratio | 3.69 |
| | UCT Ratio | 0.00 |
| | RIM Ratio | 0.00 |

| Category | Benefit/Cost | SCT | UCT | RIM | NPV($MM) | % of total |
|---|---|---|---|---|---|---|
| Benefit | Net Avoided CO2 | Y | N | N | $27.44 | 99% |
| | Net Avoided Energy Costs | Y | N | N | $0.25 | 1% |
| | Reliability/Resiliency* | Y | N | N | $0.00 | 0% |
| | Avoided Water Impacts* | Y | N | N | $0.00 | 0% |
| | Avoided Land Impacts* | Y | N | N | $0.00 | 0% |
| | TOTAL BENEFITS | $27.69 | 0 | 0 | $27.69 | |
| Cost | Program Implementation Costs | Y | Y | Y | $4.27 | 57% |
| | DR Performance Payments | Y | Y | Y | $3.24 | 43% |
| | TOTAL COSTS | $7.51 | $7.51 | $7.51 | $7.51 | |

System Efficiency Benefit Cost Analysis Detail

| System Efficiency Benefits ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) | |
|---|---|---|---|---|---|---|---|---|---|
| Net Avoided CO2** | CY 19-23 | $0.01 | $11.68 | $13.93 | $15.83 | $17.47 | $58.92 | $27.44 | ** |
| Net Avoided Energy Costs | CY 19-23 | $0.04 | $0.05 | $0.06 | $0.07 | $0.07 | $0.31 | $0.25 | |
| Total Benefits | CY 19-23 | $0.05 | $11.74 | $13.99 | $15.90 | $17.55 | $59.23 | $27.69 | |

| System Efficiency Costs ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) | |
|---|---|---|---|---|---|---|---|---|---|
| Program Implementation Costs | | | | | | | | | |
| RNG Interconnection CapEx | CY 20-23 | | $0.45 | $0.45 | $0.45 | $0.45 | $1.80 | $1.54 | |
| RNG Interconnection OpEx** | CY 20-23 | | $1.10 | $1.10 | $1.10 | $1.10 | $4.40 | $2.28 | ** |
| DR CapEx | CY 19-23 | $0.11 | $0.03 | $0.03 | $0.03 | | $0.19 | $0.17 | |
| DR OpEx | CY 19-23 | $0.05 | $0.05 | $0.05 | $0.10 | $0.10 | $0.34 | $0.27 | |
| DR Performance Payments | CY 19-23 | $0.47 | $0.69 | $0.84 | $0.98 | $1.01 | $3.98 | $3.24 | |
| Total Costs | CY 19-23 | $0.62 | $2.32 | $2.46 | $2.65 | $2.65 | $10.70 | $7.51 | |

*Qualitative benefit not calculated and included in BCA
**NPV calculated based on a 20 year life of investment. A project connected in CY19 generates 20 years of CO2 reductions and 20 years of O&M

**Exhibit____(FOH-2)**

Schedule 3

KEDNY
Carbon Reduction Portfolio Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV ($MM) |
|---|---|---|
| Benefits | Total | $1.80 |
| | SCT | $1.80 |
| | UCT | $1.05 |
| | RIM | $1.05 |
| Costs | Total | $16.91 |
| | CapEx split | $0.00 |
| | O&M split | $16.91 |
| | SCT | $16.91 |
| | UCT | $1.83 |
| | RIM | $1.83 |
| Cost-Effectiveness Tests | SCT Ratio | 0.11 |
| | UCT Ratio | 0.57 |
| | RIM Ratio | 0.86 |

| Category | Benefit / Cost | SCT | UCT | RIM | NPV ($MM) | % of total |
|---|---|---|---|---|---|---|
| Benefits | Net Avoided CO2 | Y | Y | Y | $1.95 | 108% |
| | Net Avoided Energy Costs | Y | N | N | -$0.15 | -8% |
| | TOTAL BENEFITS | 1.80 | $1.05 | $1.05 | $1.80 | |
| Costs | Geothermal Opex | Y | Y | Y | $1.43 | 8% |
| | Green Gas Tariff Opex | Y | Y | Y | $0.40 | 2% |
| | Customer Investment | Y | N | N | $1.53 | 9% |
| | Customer Fuel Cost | Y | N | N | $13.55 | 80% |
| | Total Costs | $16.91 | $9.16 | $9.16 | $16.91 | |

Carbon Reduction Benefit Cost Analysis Detail

| Carbon Reduction Benefits ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) |
|---|---|---|---|---|---|---|---|---|
| Net Avoided CO2 | CY 20-23 | | $ 0.33 | $ 0.34 | $ 0.35 | $ 0.38 | $ 1.39 | $1.95 |
| Net Avoided Energy Costs | CY 20-23 | | $ (0.00) | $ (0.00) | $ (0.01) | $ (0.01) | $ (0.03) | -$0.15 |
| Total Benefits | CY 20-23 | | $ 0.25 | $ 0.30 | $ 0.39 | $ 0.53 | $ 1.46 | $1.80 |

| Carbon Reduction Costs ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) |
|---|---|---|---|---|---|---|---|---|
| Program Administration Costs | | | | | | | | |
| Geothermal Opex | CY 20-23 | | $0.22 | $0.33 | $0.51 | $0.65 | | $1.43 |
| Green Gas Tariff Opex | CY 20-23 | | $0.00 | $0.16 | $0.16 | $0.16 | | $0.40 |
| Customer Investment | CY 20-23 | | $0.17 | $0.33 | $0.58 | $0.77 | | $1.53 |
| Customer Fuel Cost | CY 20-23 | | $1.86 | $1.88 | $1.91 | $1.94 | | $13.55 |
| Total Costs | CY 20-23 | | $2.24 | $2.69 | $3.16 | $3.52 | | $16.91 |

**Exhibit____(FOH-2)**

Schedule 4

KEDLI
Carbon Reduction Portfolio Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV ($MM) |
|---|---|---|
| Benefits | Total | $17.52 |
| | SCT | $17.52 |
| | UCT | $7.90 |
| | RIM | $7.90 |
| Costs | Total | $30.30 |
| | CapEx split | $0.00 |
| | O&M split | $30.30 |
| | SCT | $30.30 |
| | UCT | $9.16 |
| | RIM | $9.16 |
| Cost-Effectiveness Tests | SCT Ratio | 0.58 |
| | UCT Ratio | 0.86 |
| | RIM Ratio | 0.86 |

| Category | Benefit / Cost | SCT | UCT | RIM | NPV ($MM) | % of total |
|---|---|---|---|---|---|---|
| Benefits | Net Avoided CO2 | Y | Y | Y | $4.84 | 28% |
| | Net Avoided Energy Costs | Y | N | N | $12.69 | 72% |
| | TOTAL BENEFITS | $17.52 | $7.90 | $7.90 | $17.52 | |
| Costs | Geothermal Opex | Y | Y | Y | $8.74 | 29% |
| | Green Gas Tariff Opex | Y | Y | Y | $0.41 | 1% |
| | Customer Investment | Y | N | N | $11.82 | 39% |
| | Customer Fuel Cost | Y | N | N | $9.32 | 31% |
| | Total Costs | $30.30 | $9.16 | $9.16 | $30.30 | |

Carbon Reduction Benefit Cost Analysis Detail

| Carbon Reduction Benefits ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) |
|---|---|---|---|---|---|---|---|---|
| Net Avoided CO2 | CY 20-23 | | $0.25 | $0.30 | $0.40 | $0.54 | $1.49 | $4.84 |
| Net Avoided Energy Costs | CY 20-23 | | $0.10 | $0.10 | $0.10 | $0.10 | $0.40 | $12.69 |
| Total Benefits | CY 20-23 | | $0.35 | $0.40 | $0.50 | $0.64 | $1.89 | $17.52 |

| Carbon Reduction Costs ($MM) | Time Period | CY19 | CY20 | CY21 | CY22 | CY23 | Real ($MM) | NPV ($MM) |
|---|---|---|---|---|---|---|---|---|
| Program Administration Costs | | | | | | | | |
| Geothermal Opex | CY 20-23 | | $0.98 | $1.89 | $3.31 | $4.37 | | $8.74 |
| Green Gas Tariff Opex | CY 20-23 | | $0.00 | $0.16 | $0.17 | $0.17 | | $0.41 |
| Customer Investment | CY 20-23 | | $1.31 | $2.53 | $4.45 | $5.98 | | $11.82 |
| Customer Fuel Cost | CY 20-23 | | $1.86 | $1.88 | $1.91 | $1.94 | | $9.32 |
| Total Costs | CY 20-23 | | $4.15 | $6.46 | $9.84 | $12.46 | | $30.30 |

**Testimony of Future of Heat**

**Exhibit____(FOH-2)**

Schedule 5

KEDNY
LMI Oil-to-Gas Conversions Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV ($MM) |
|---|---|---|
| Benefits | Total | $9,502,372 |
| | SCT | $9,502,372 |
| | UCT | $ - |
| | RIM | $ - |

| | | |
|---|---|---|
| Costs | Total | $5,491,262 |
| | CapEx split | $ - |
| | O&M split | $5,491,262 |
| | SCT | $5,491,262 |
| | UCT | $5,491,262 |
| | RIM | $5,491,262 |

| | | |
|---|---|---|
| Cost-Effectiveness Tests | SCT Ratio | 1.73 |
| | UCT Ratio | 0 |
| | RIM Ratio | 0 |

| Category | Benefit / Cost | SCT | UCT | RIM | NPV ($MM) | % of total | | |
|---|---|---|---|---|---|---|---|---|
| Benefit | Participant Energy Cost Reductions | $8,421,139.87 | 0 | 0 | $8,421,139.87 | 88.62% | | |
| | Avoided CO2 Emissions | $1,081,233 | 0 | 0 | $1,081,233.00 | 11.38% | | |
| | | | | | | | CapEx (NPV) | O&M (NPV) |
| Cost | Program Administration Costs | $5,491,262 | $5,491,262 | $5,491,262 | $5,491,262 | 100.00% | | $5,491,262 |

**Testimony of Future of Heat**

**Exhibit____(FOH-2)**

Schedule 6

KEDLI
LMI Oil-to-Gas Conversions Benefit Cost Analysis Summary
($MM)

| Category | Item | NPV ($MM) |
|---|---|---|
| Benefits | Total | $6,876,157 |
| | SCT | $6,876,157 |
| | UCT | $ - |
| | RIM | $ - |

| | | |
|---|---|---|
| Costs | Total | $6,177,670 |
| | CapEx split | $ - |
| | O&M split | $6,177,670 |
| | SCT | $6,177,670 |
| | UCT | $6,177,670 |
| | RIM | $6,177,670 |

| | | |
|---|---|---|
| Cost-Effectiveness Tests | SCT Ratio | 1.11 |
| | UCT Ratio | 0 |
| | RIM Ratio | 0 |

| Category | Benefit / Cost | SCT | UCT | RIM | NPV ($MM) | % of total | | |
|---|---|---|---|---|---|---|---|---|
| Benefit | Participant Energy Cost Reductions | $6,075,243.86 | 0 | 0 | $6,075,243.86 | 88.35% | | |
| | Avoided CO2 Emissions | $800,913 | 0 | 0 | $800,913.00 | 11.65% | | |
| | | | | | | | CapEx (NPV) | O&M (NPV) |
| Cost | Program Administration Costs | $6,177,670 | $6,177,670 | $6,177,670 | $6,177,670 | 100.00% | | $6,177,670 |

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-3)**

**Gas Demand Response REV Demonstration Project Quarterly Report for the Fourth Quarter of 2018, ending December 31, 2018**

nationalgrid

**Janet M. Audunson, P.E., Esq.**
Assistant General Counsel

January 31, 2019

**VIA ELECTRONIC DELIVERY**

Honorable Kathleen H. Burgess
Secretary
New York State Public Service Commission
Three Empire State Plaza, 19th Floor
Albany, New York 12223-1350

**RE: Case 16-G-0058 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corporation d/b/a National Grid for Gas Service**

**Case 16-G-0059 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY for Gas Service**

**NATIONAL GRID: GAS DEMAND RESPONSE REV DEMONSTRATION PROJECT – Q4 2018 REPORT**

Dear Secretary Burgess:

KeySpan Gas East Corporation d/b/a National Grid and The Brooklyn Union Gas Company d/b/a National Grid NY (collectively "National Grid" or the "Companies") hereby submit for filing the quarterly report for the Gas Demand Response REV Demonstration Project covering the period of October 1, 2018 to December 31, 2018 ("Q4 2018 Report"). This Q4 2018 Report additionally satisfies the Commission's requirement in the December 16, 2016 *Order Adopting Terms of Joint Proposal and Establishing Gas Rate Plans* in Cases 16-G-0058 and 16-G-0059 that the Companies file annual reports within forty-five (45) days after the end of each rate year providing the status of the implementation of each gas REV demonstration project and any preliminary findings.

Please direct any questions regarding this filing to:

Anntonette Alberti
Manager, Complex Demo
National Grid
1125 Broadway
Albany, New York 12204
Tel.: 518-433-5213
Mobile: 518-369-2100
Email: Anntonette.Alberti@nationalgrid.com

National Grid looks forward to continuing to work collaboratively with the New York State Department of Public Service Staff as it proceeds with the implementation of the Gas Demand Response REV Demonstration Project.

Respectfully submitted,

*/s/ Janet M. Audunson*

Janet M. Audunson, P.E., Esq.
Assistant General Counsel

Enc.

cc: Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Robert Cully, DPS Staff, w/enclosure (via electronic mail)
Cynthia McCarran, DPS Staff, w/enclosure (via electronic mail)
John Sano, DPS Staff, w/enclosure (via electronic mail)
Davide Maioriello, DPS Staff, w/enclosure (via electronic mail)
Carlos Nouel, w/enclosure (via electronic mail)
Fouad Dagher, w/enclosure (via electronic mail)
Cathy Hughto-Delzer, w/enclosure (via electronic mail)
Arunkumar Vedhathiri, w/enclosure (via electronic mail)
Anntonette Alberti, w/enclosure (via electronic mail)
Owen Brady, w/enclosure (via electronic mail)

nationalgrid

# Gas Demand Response
# REV Demonstration Project
# in
# New York City and Long Island

## Q4 2018 Report

January 31, 2019

# Table of Contents

# 1.0 Executive Summary

The Gas Demand Response REV Demonstration Project (the "Project") being implemented by The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas East Corporation d/b/a National Grid (collectively, "National Grid" or the "Companies" and individually, "KEDNY" and "KEDLI") will test a customer-centric, voluntary gas demand response ("DR") program targeting large commercial, firm gas customers in locations prioritized by predicted distribution constraints. Current interruptible ("IT") or temperature controlled ("TC") customers may also be included in the Project. The introduction of a gas DR program should allow the Companies to operate their assets in the most efficient way possible.

Project accomplishments to date:

- During year 1, a total of five (5) events were called, with two (2) events being exclusive to KEDLI customers.
- 100% (16 out of 16) of enrolled facilities participated in this first season.
- Initial results indicate the customers were able to curtail the loads as planned.
- The payments for the first DR season were processed and distributed to customers in April. The total incentive payments for the season were $302,847.50.
- The analysis completed on the data from this first season appears to show a positive impact on gas system pressures, though more data will be needed to verify this result.
- Met with Department of Public Service Staff in June 2018 to present findings from the first season and to discuss modifications for the second season.
- Other than one KEDNY customer who had to drop out due to operational changes, all customers have expressed interest in continuing their participation.
- A large property management company submitted applications for 41 of their facilities, indicative of the additional demand in the market.

# 2.0 Highlights since Implementation Plan Filing

The following sections highlight key activities accomplished during Q4 2018, as well as key activities planned for Q1 2019.

## 2.1 Marketing and Customer Engagement

During Q4 2018, the DR Project team, along with the Operations and Long-term Planning groups, determined that maintaining the current contingent of customers would be ideal as the data collected, both in terms of reliability of participation and in terms of system pressure impacts, could be compared with the previous year to create a richer data set. The DR Project team met with all the Project participants to determine their interest in continuing to participate. Other than one facility that would be unable to continue due to a change in their operations, all others were interested in continuing to participate. Based on this, the Project team determined that it was reasonable to extend the existing agreements at the same participation and incentive levels for these customers for Year 2. This simplified

the experience for participants and ensured a consistent dataset to further analyze from Year 1 to Year 2.

As stated in the Q3 2018 Project Report, it was determined as part of the IT/TC Collaborative[1] that a large property management company, which had an interest in exploring the possibility of a new dual-fuel rate, would participate in the DR pilot. The property management company submitted an application for 41 of its facilities, indicating that this concept could be scaled relatively easily if the need presented itself. Due to Project constraints, the Project team worked with this company and its consultant to select one facility that would provide the maximum level of value, both to the participant and the Project. This facility was enabled in November 2018.

The list of participants for Year 2 is as follows:

| Service Territory | Service Territory | Type | Units* |
|---|---|---|---|
| **Kings Point** | KEDLI | Cooking | 4.0 |
| **Kings Point** | KEDLI | Heating | 74.0 |
| **Kings Point** | KEDLI | Heating | 24.5 |
| **Mineola** | KEDLI | Manufacturing | 9.4 |
| **Port Jefferson** | KEDLI | Heating | 4.0 |
| **Brooklyn** | KEDNY | Heating | 70.0 |
| **Brooklyn** | KEDNY | Heating | 33.6 |
| **Brooklyn** | KEDNY | Heating | 19.4 |
| **Brooklyn** | KEDNY | Heating/Laundry | 33.4 |
| **Brooklyn** | KEDNY | Heating/Dehumidification | 25.1 |
| **Queens** | KEDNY | Heating | 25.6 |
| **Queens** | KEDNY | Heating | 29.2 |
| **Queens** | KEDNY | Heating | 108.0 |
| **Queens** | KEDNY | Heating | 9.8 |
| **Staten Island** | KEDNY | Heating | 6.98 |
| **Staten Island** | KEDNY | Heating | 6.0 |
| *1 Unit = 500 cubic feet per hour ("CFH") = 500,000 BTU/hr. | | | |

## 2.2 Customer-site Systems

### 2.2.1 Gas Usage Measurement

Since the inception of the Project, gas consumption has been measured on one-minute intervals. It was the belief of the Project team that this level of granularity would be an asset to customers and to the Companies. However, as the integrity of the data has continued to improve, it has become clear that this level of granularity makes the data challenging to work with. Figure 1 below shows a five-hour time period with the data presented at the one-minute level. The sawtooth shape of the data is an indication

[1] *See* Cases 16-G-0058, *et al.*, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Key Span Gas East Corporation d/b/a National Grid for Gas Service*, Order Adopting Terms of Joint Proposal and Establishing Gas Rate Plans (issued December 16, 2016), pp. 49-50, where National Grid committed, under section VI.10.7 of the Joint Proposal, to commence a collaborative to address such IT/TC issues as the structure of services, rates and alternative fuel documentation requirements, followed by a report to the Commission with recommendations and/or positions of the parties for Commission decision.

that consumption does not occur every minute. Here, the greater density of the spikes represents a period of greater consumption. This is not intuitive and can obscure trends.

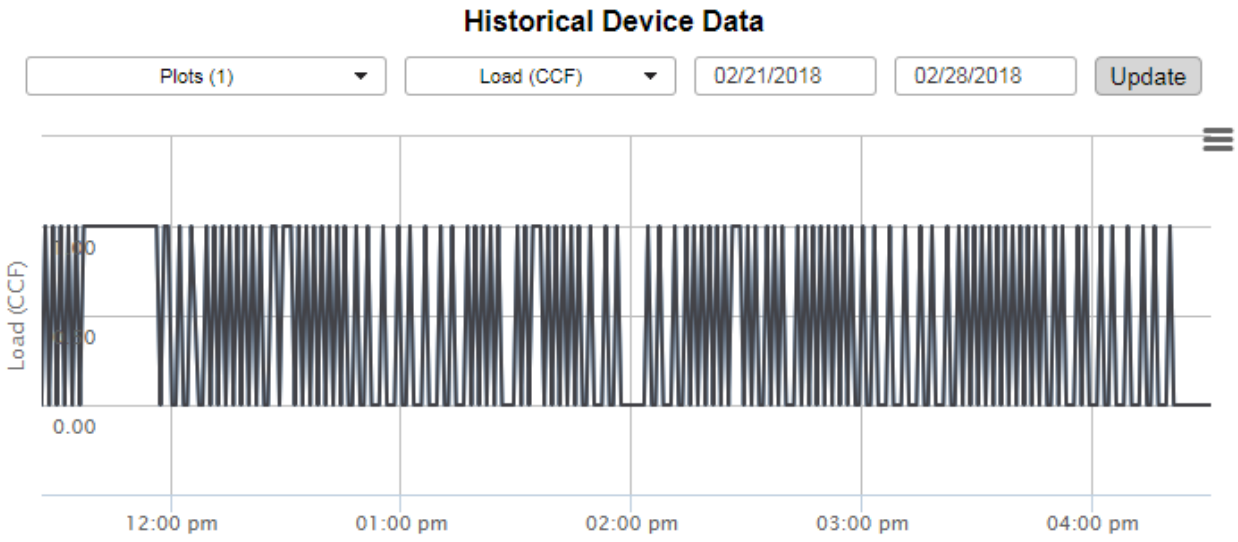



Figure 1: One-minute Interval Gas Usage Over a Five-hour Time Period

The Project team explored the possibility of modifying the existing DR systems to record data in five-minute intervals instead. The data has always been uploaded every five minutes, so the belief was this could be implemented with minimal disruption while providing greater insight. It was tested on one account to verify these assumptions. Figure 2 below shows a five-hour time period with the data recorded once every five minutes (*i.e.*, each data point represents the sum total of all of the KYZ pulses generated during the preceding five minutes).

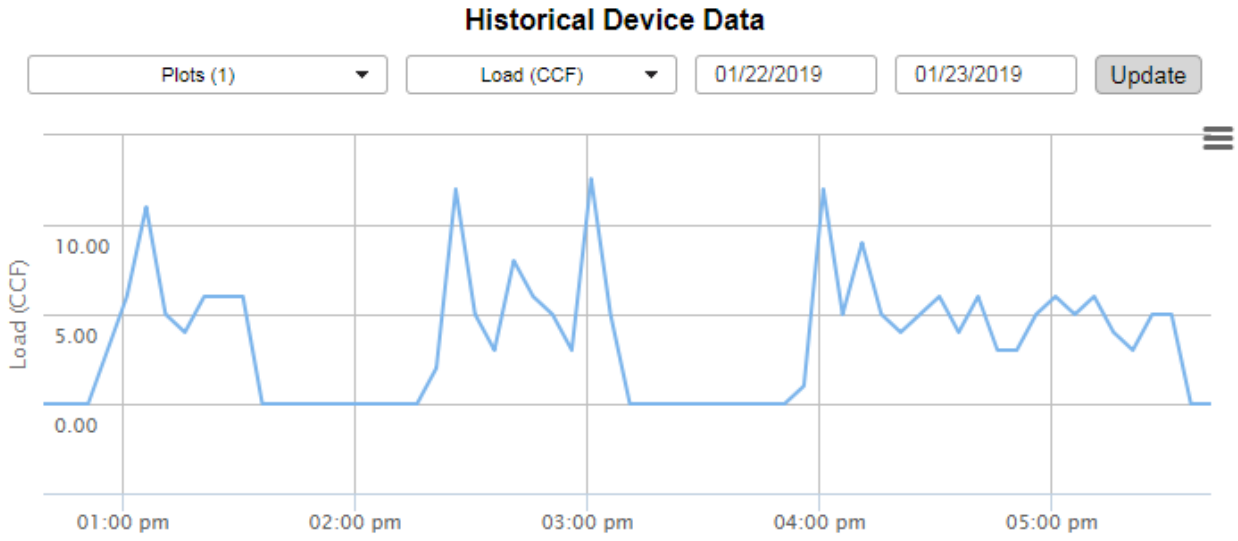



Figure 2: Five-minute Interval Gas Usage Over a Five-hour Time Period

Based on conversations with internal stakeholders and participants, it was agreed that this representation of consumption would be much more useful. The change was applied to all sites.

### 2.2.2 Remote Device Control

IPKeys Technologies, LLC ("IPKeys") made the necessary updates to the DR system components during Q4 2018. In addition to the software updates for the EISS® Box 3.0 itself, which were required based on the nature of the Project, IPKeys made hardware updates that improved the stability of the cellular connections at sites where the connection was intermittent. As part of the iterative testing and updates cycles that had been undertaken, it was frequently necessary to power-cycle the EISS Box (*i.e.*, shut the box down, allow the on-board systems to reset, and then reboot the box). This would require manually visiting each site for work that would take roughly one minute. The Project team worked with IPKeys to identify a Wi-Fi connected power outlet that could be disabled using the cellular connection from the CradlePoint cellular router. This reduced the need for site visits and allow IPKeys to support customers remotely, improving response times. However, after several installations occurred, it became clear that the presence of these outlets was, unexpectedly, impacting the stability of the cellular connection. They were removed based on this finding to ensure that the system had reliable connectivity.

The Project team continues to participate in the Companies' Advanced Metering Infrastructure ("AMI") discussions, as the presence of AMI at participant sites would simplify the equipment requirements for scaling gas demand response initiatives.

## 2.3 Management Software

### 2.3.1 Communication Platform

No changes were made to the Communication Platform during Q4 2018.

### 2.3.2 Energy Insights & Actionable Information

The Engage portal, which is the customer portal that participants will use to review their usage data, has been continually updated. In Q4 2018, the baseline function was added. The baseline function uses the methods for calculating baselines that were described in earlier Project quarterly reports (*i.e.*, ISO New England ("ISO-NE") 10 of 10 method[2] and Middle 8 of 10 method[3]) to calculate what a customer is likely to use based on their historical usage on applicable days. This will allow customers to see how their current usage compares to what it is likely they would have used based on past consumption.

In addition to the discussion above about switching from a one-minute to a five-minute data interval, the baseline data provided another compelling argument. With the data being recorded on a one-minute interval, many of the values were zero as no usage could occur in a given one-minute period. This meant that the baseline was calculated to be a decimal value for each minute for almost all

[2] The ISO-NE 10 of 10 method involves taking an average consumption for each hour based on the 10 previous, relevant (non-weekend) days.
[3] The Middle 8 of 10 method involves calculating an average consumption for each hour based on 8 of the 10 previous relevant days. The days with the minimum and maximum total consumption are eliminated. This is similar to the Middle 4 of 6 method that was described in the Q2 2018 Report but gives slightly less weight to the eliminated days.

accounts. Given that the data that comes from the KYZ pulse is inherently integer values, the customer could have interpreted their usage as always being above the baseline. The change to five-minute data should make the baseline calculation more useful.

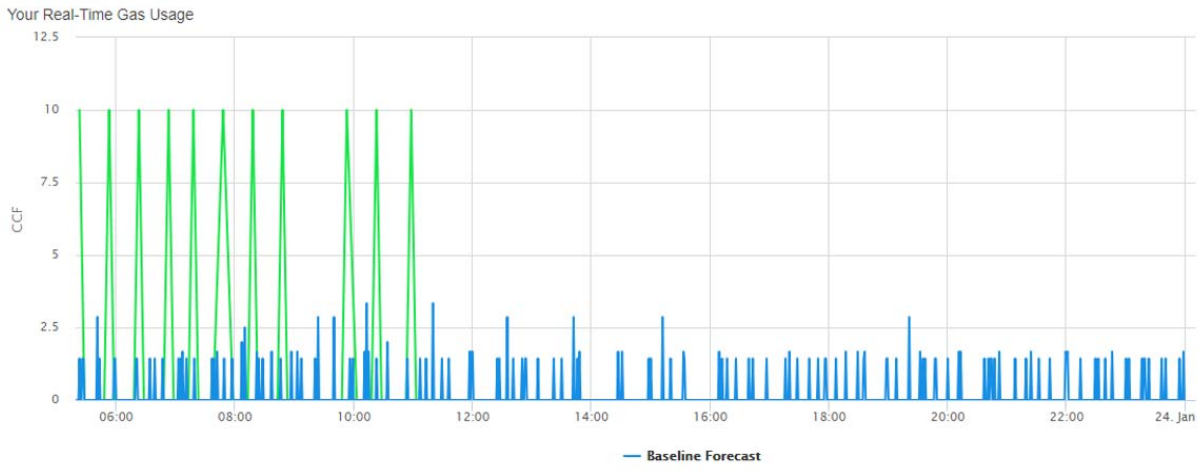



**Figure 3: Engage Customer Portal Dashboard with Baseline Based on One-Minute Data**

## 2.4 Pricing

No changes were made to the pricing model since the Q4 2017 Report.

## 2.5 Project Design

Based on the need to gather more data and to verify the opportunities, the changes outlined below will be explored during Year 2 with the possibility of inclusion in Year 3 of the Project.

### 2.5.1 Baseline

No changes have been made to the baseline approach since the Q2 2018 Report. As discussed therein, National Grid will be reviewing the two different baselines, which are generated automatically as part of the Demand Response Optimization and Management System ("DROMS™") that is being supplied by AutoGrid Systems, Inc. ("AutoGrid"), to determine which is most appropriate for gas customers.

### 2.5.2 Direct Load Control by Utility vs. Customer-Initiated Control

Discussion of this topic has not progressed beyond that which was stated in the Q3 2018 Report.

## 2.6 Load Relief Analysis and Operational Impact

As stated in the Q1 2018 Report, the Project team has analyzed the impact of the DR events on the distribution system following the conclusion of Year 1. Depending on the day and the state of the distribution system, the effect was more or less pronounced. There are several days, including during the coldest event day on Jan 17, 2018, where the system pressure was impacted positively. This effect is most pronounced during the peak hours, as was expected. More data is needed before the causal relationship can be characterized.

## 2.7 Project Benefit-Cost Analysis

On the distribution pressure side, it appears to be possible that localized pressure constraints could be alleviated through gas DR. The Project team will be verifying this over the subsequent two DR seasons, but the logic is sound, and the early results are encouraging.

On the supply side, it is unlikely that gas DR could operate at a scale that would be sufficient to affect regional market pricing. The supply market is complex and highly reactive. National Grid's expectation is that any excess capacity that was created by DR would quickly be absorbed, resulting in a minimal change to overall market pricing. It is possible that DR can create supply side value for the Companies in that it could help National Grid to manage load and operate within contract limitations, which would help avoid penalties. Supply contracts almost always include a breakdown of the maximum allowable take per hour, which is a percentage of the Maximum Daily Delivery Obligation ("MDDO"). If a customer is approaching their maximum take for a given period of time, it is possible that gas DR could help to manage this and, therefore, create value.

## 2.8 Activations

### 2.8.1 Year 1

During the first DR season (2018), the following events were called:

| Event Date | Jan 17 | Feb 13 | Feb 23 | Feb 27 | Feb 28 |
|---|---|---|---|---|---|
| Called in KEDNY | Yes | No | No | Yes | Yes |
| Called in KEDLI | Yes | Yes | Yes | Yes | Yes |

The details of participation in Year 1 events are outlined in Table 1 below.

| Service Territory | Type | Units* | % of Total Gas Demand | Q1 2018 performance – No. of events participated |
|---|---|---|---|---|
| Mineola (KEDLI) | Manufacturing | 9.4 | 50% | 4** |
| Brooklyn (KEDNY) | Heating | 70.0 | 50% | 3 |
| Brooklyn (KEDNY) | Heating | 33.6 | 79% | 3 |
| Queens (KEDNY) | Heating | 25.6 | 50% | 3 |
| Brooklyn (KEDNY) | Heating | 19.4 | 32% | 3 |
| Brooklyn (KEDNY) | Heating/Laundry | 33.4 | 25% | 3 |
| Queens (KEDNY) | Heating | 29.2 | 50% | 3 |
| Staten Island (KEDNY) | Heating | 6.98 | 34% | 2** |
| Queens (KEDNY) | Heating | 10.4 | 50% | 3 |
| Brooklyn (KEDNY) | Heating/ Dehumidification | 25.1 | 100% | 2** |
| Queens (KEDNY) | Heating | 9.8 | 100% | 3 |
| Staten Island (KEDNY) | Heating | 6.0 | 75% | 2** |
| Kings Point (KEDLI) | Cooking | 4.0 | 100% | 5 |
| Kings Point (KEDLI) | Heating | 74.0 | 100% | 5 |
| Kings Point (KEDLI) | Heating | 24.5 | 100% | 5 |
| Port Jefferson (KEDLI) | Heating | 4.0 | 20% | 4** |
| *1 Unit = 500 cubic feet per hour ("CFH") = 500,000 BTU/hr.<br>** Customers were ready and willing to participate but communication challenges rendered the DLC system nonresponsive at these sites. | | | | |

**Table 1: List of Participating Customer Sites**

### 2.8.2 Year 2

Given that all but one customer participated in the program last winter and that there were no changes to the structure of the program or events, the Project team, in consultation with the customers, determined that it was not necessary to conduct a dry-run this season.

No events were called during Q4 2018. There was a period of extended cold weather preceding Thanksgiving but this fell outside the defined DR Season (Dec 1 through end of February) so it was not possible to call an event. The Project team is assessing historical data for curtailment events for non-firm customers in downstate New York to assess whether the existing limitations, in terms of DR season timing, event length, and the number of events, is appropriate for DR to be utilized as a scaled resource.

## 2.9 Challenges, Changes, and Lessons Learned

At this juncture in the Project, the following has been identified:

| Qtr. | Issue or Change | Resulting Change to Project Scope/Timeline? | Strategies to Resolve | Lessons Learned |
|---|---|---|---|---|
| Q4 2018 | Wi-Fi connected power outlets | None | Remove Wi-Fi | It is important to achieve the strongest possible cellular |

| | | | | |
|---|---|---|---|---|
| | reduce cellular connection stability | | connected outlets | connection during the initial install of DR Systems. If a strong, constant cell signal is not possible, explore alternatives. |
| **Q4 2018** | 1-minute interval data obscured insights | None | Switch to 5-minute interval data | Having more data does not necessarily create more value. Test alternatives at select sites to determine the best path forward |

# 3.0 Next Quarter Forecast

During Q1 2019, the Project team will continue to call events during the remainder of the DR Season, will evaluate the baseline and usage data, and will begin compiling end of season data based on the events called. Additionally, the Project team will continue discussions with other departments within National Grid to determine the optimal program structure for a scaled DR offering.

## 3.1 Checkpoints/Milestone Progress

### 3.1.1 Summary

| Checkpoint/Milestone | Anticipated Start-End Date | Revised Start-End Date | Status |
|---|---|---|---|
| **National Grid's Strategic Sales and Gas Sales Support to sign-up customers for the Project** | 6/1/17-11/30/17 | 6/1/17-9/30/17 | ✓ |
| **Set up processes to issue payment within 90 days of the conclusion of the DR season** | 6/1/17-11/30/17 | No Change | ✓ |
| **Coordinate communication methods with National Grid's Gas Control and the selected software for the Project.** | 6/1/17-9/30/17 | No Change | ✓ |
| **Enhance and automate interfaces within National Grid's systems to support interactions with selected customer sites** | 6/1/17-11/30/17 | No Change | ✓ |
| **Install necessary site equipment** | 9/15/17-11/1/17 | 9/30/17-1/19/18 | ✓ |
| **Work with National Grid's Advanced Data Analytics group on benefit-cost analysis (BCA) and end-of-season incentive payment** | 3/1/17-11/30/17 | 3/1/17-3/1/18 | ✓ |

**Key**

- On-Track
- Delayed start, at risk of on-time completion, or over-budget
- Terminated/abandoned checkpoint
- ✓ Milestone Completed

Work Stream

| Work Stream | Future Milestones | Status |
|---|---|---|
| Information Systems ("IS") | **Perform penetration test on EISS® BOX 3.0 controller** | ● |
| | **Oversee migration of DR System from 3G to 4G LTE** | ✓ |
| | **Develop plan for supporting scaled gas DR project** | ● |
| Operations | **Support participating customers during DR season** | ✓ |
| | **Complete site checks to verify successful operation and participation in the gas DR program by customers** | ✓ |
| Gas DR Team | **Contact customers following dry run to ensure success and to make any needed modifications before DR season** | ✓ |
| | **Develop plan for timing of activations** | ✓ |
| | **Summarize findings based on sales experience** | ✓ |
| | **Summarize findings from site enablement process to develop lessons learned for Years 2 and 3** | ● |

### 3.1.2 Checkpoints

| Scenario | Description | Target | Status (if known) |
|---|---|---|---|
| **$ expanded per "Unit" of demand reduction** | Per unit present value ("PV") of costs and payments ($/DTH/hr.) | Cap the Project below normal winter distribution charge. | 46% under budget across all customers |
| **Actual load reduction potential per participating customer for process and heating loads** | % reduction of customer's historical winter peak | Average of 25% process and 10% heating loads. | Exceeded the target for reduction per customer. |
| **Predicted market penetration rate** | # of participants, expressed as a percentage, per SIC[4] code | 15% of customers in each SIC code | Sample size too small. Will need additional data and will be determined in report at end of the Project. |
| **Significance of demand reduction potential** | Gross Potential in DTh/hr. | 140 total (80 DTh/hr. in KEDNY and 60 DTh/hr. in KEDLI) | 192 DTh/hr. committed |
| **Potential impact on gas system planning** | Per unit PV of costs and payments ($/DTH-hr.) | Comparable to per unit growth capital | Will be determined during annual review. |
| **Satisfaction with gas DR compared to existing programs** | Percent of participants "satisfied" or better. | Exceed satisfaction level of Interruptible and TC customers - | Will be determined during customer survey at the end of the Project. |

[4] Standard Industrial Classification.

# 4.0 Work Plan and Budget Review

## 4.1 Updated Work Plan

| Task Name | Start | Finish |
|---|---|---|
| Year One | Thu 12/1/16 | Tue 7/10/18 |
| Year Two | Mon 7/9/18 | Wed 7/10/19 |
| Sales | Mon 7/9/18 | Sun 9/30/18 |
| Operations | Mon 7/16/18 | Fri 11/30/18 |
| Season Prep | Mon 10/1/18 | Mon 11/12/18 |
| DR Season | Wed 1/9/19 | Fri 3/1/19 |
| First Activation | Wed 1/9/19 | Fri 1/25/19 |
| Subsequent Activations | Mon 1/28/19 | Fri 3/1/19 |
| Closing | Sat 12/1/18 | Wed 7/10/19 |
| Billing | Sat 12/1/18 | Thu 4/25/19 |
| M&V | Fri 3/1/19 | Thu 5/2/19 |
| Reporting | Tue 3/5/19 | Mon 3/25/19 |
| Operations Review | Tue 3/26/19 | Wed 5/1/19 |
| Account Management | Thu 5/2/19 | Wed 7/10/19 |

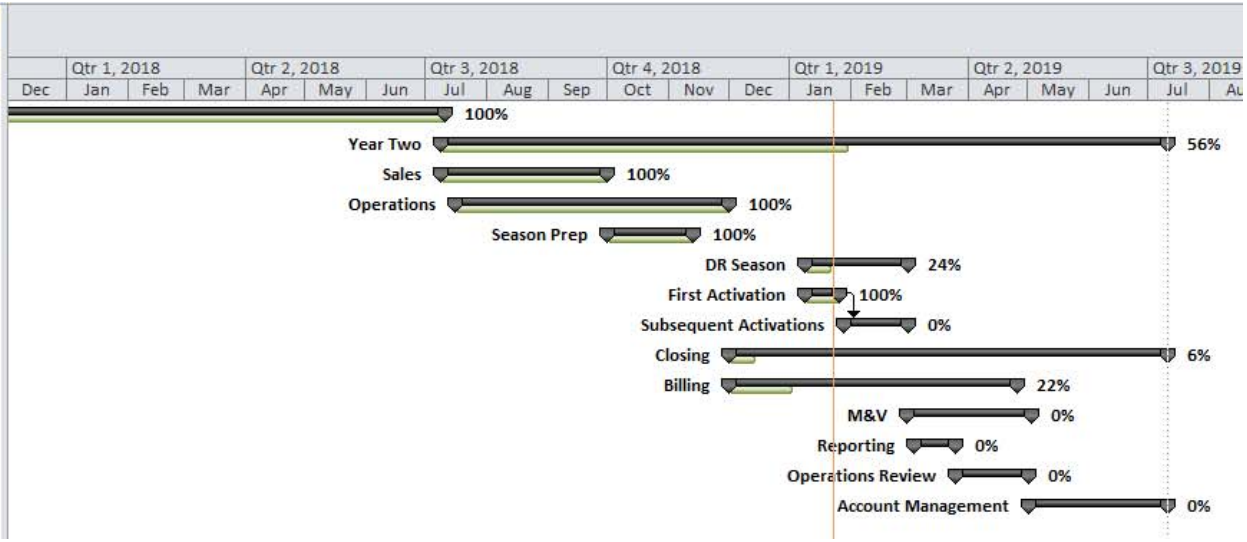



Exhibit ___ (FOH-3)
Page 14 of 15

## 4.2 Updated Budget

Additional CapEx was spent to enable one new customer site, to increase cellular coverage at sites that proved unstable, and to upgrade gas metering infrastructure so that it could integrate with the DR System. OpEx expenditures represent the majority the ongoing fees for the AutoGrid platform.

The three-year total budget for the Project will be able to be maintained.

Year 2 Budget Report:

| Project Task | 4th Quarter Actual Spend[5] | Project Total Spend to Date | Project Budget[6] | Remaining Balance |
|---|---|---|---|---|
| **CapEx** | | | | |
| Total | $28,727.62 | $158,982.82 | $114,000.00 | ($44,982.82) |
| **OpEx** | | | | |
| Total | $31,166.76 | $512,050.89 | $1,218,600.00 | $706,549.11 |
| **Project Totals** | **$59,894.38** | **$671,033.71** | **$1,332,600.00** | **$661,566.29** |

[5] Actual spend reflects costs that were invoiced to National Grid during the applicable period. The exception to this would be for Q1 reports when National Grid will accrue expenses consistent with its end of year accounting practices.

[6] National Grid updated the Project budget to reflect incremental costs and account for costs that may have originally been characterized as capital or operating expenses, but now, because of changed circumstances (*e.g.*, leasing instead of owning software), should be categorized differently.

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-4)**

**Geothermal Demonstration Project Quarterly Report for the Fourth Quarter of 2018, ending December 31, 2018**

nationalgrid

**Janet M. Audunson, P.E., Esq.**
Assistant General Counsel

January 31, 2019

**VIA ELECTRONIC DELIVERY**

Honorable Kathleen H. Burgess
Secretary
New York State Public Service Commission
Three Empire State Plaza, 19th Floor
Albany, New York 12223-1350

**RE: Case 16-G-0058 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corporation d/b/a National Grid for Gas Service**

**KEYSPAN GAS EAST CORPORATION d/b/a NATIONAL GRID: GEOTHERMAL GAS REV DEMONSTRATION PROJECT – Q4 2018 REPORT**

Dear Secretary Burgess:

KeySpan Gas East Corporation d/b/a National Grid ("National Grid") hereby submits for filing its quarterly report for the Geothermal Gas REV Demonstration Project covering the period of October 1, 2018 to December 31, 2018 ("Q4 2018 Report"). This Q4 2018 Report additionally satisfies the Commission's requirement in the December 16, 2016 *Order Adopting Terms of Joint Proposal and Establishing Gas Rate Plans* in Cases 16-G-0058 and 16-G-0059 that National Grid file annual reports within forty-five (45) days after the end of each rate year providing the status of the implementation of each gas REV demonstration project and any preliminary findings.

Please direct any questions regarding this filing to:

Anntonette Alberti
Manager, Complex Demo
National Grid
1125 Broadway
Albany, New York 12204
Tel.: 518-433-5213
Mobile: 518-369-2100
Email: Anntonette.Alberti@nationalgrid.com

National Grid looks forward to continuing to work collaboratively with the New York State Department of Public Service Staff as it proceeds with the implementation of the Geothermal Gas REV Demonstration Project.

Respectfully submitted,

*/s/ Janet M. Audunson*

Janet M. Audunson, P.E., Esq.
Assistant General Counsel

Enc.

cc: Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Robert Cully, DPS Staff, w/enclosure (via electronic mail)
Cynthia McCarran, DPS Staff, w/enclosure (via electronic mail)
John Sano, DPS Staff, w/enclosure (via electronic mail)
Davide Maioriello, DPS Staff, w/enclosure (via electronic mail)
Carlos Nouel, w/enclosure (via electronic mail)
Fouad Dagher, w/enclosure (via electronic mail)
Cathy Hughto-Delzer, w/enclosure (via electronic mail)
Arunkumar Vedhathiri, w/enclosure (via electronic mail)
Anntonette Alberti, w/enclosure (via electronic mail)
Chong Lin, w/enclosure (via electronic mail)


# Geothermal

# Gas REV Demonstration Project

# Long Island, New York

# Q4 2018 Report

January 31, 2019

**Table of Contents**

# 1. Executive Summary

KeySpan Gas East Corporation d/b/a National Grid ("National Grid" or the "Company") is testing a shared geothermal well system to provide a cost-effective heating and cooling solution using Ground Source Heat Pumps ("GSHPs") as an alternative to extending natural gas pipes to a residential community (Glenwood Village) in the Company's service territory.

GSHP is a renewable heating and cooling technology that has the potential to decarbonize the heating and cooling sector while providing homeowners with significant energy cost savings and comfort related benefits. The technology also has the potential to deliver benefits to the gas and electric grid system.

The Company is committed to supporting the achievement of New York State's greenhouse gas ("GHG") emissions reductions goals of 40% reduction of GHG emissions reductions by 2030, and 80% by 2050. This Geothermal Gas REV Demonstration Project ("Project") will provide the Company with a test-and-learn opportunity to validate the benefits of GSHP with the New York State Energy Research and Development Authority ("NYSERDA"), confirm GSHP performance, and evaluate market strategies to increase technology adoption.

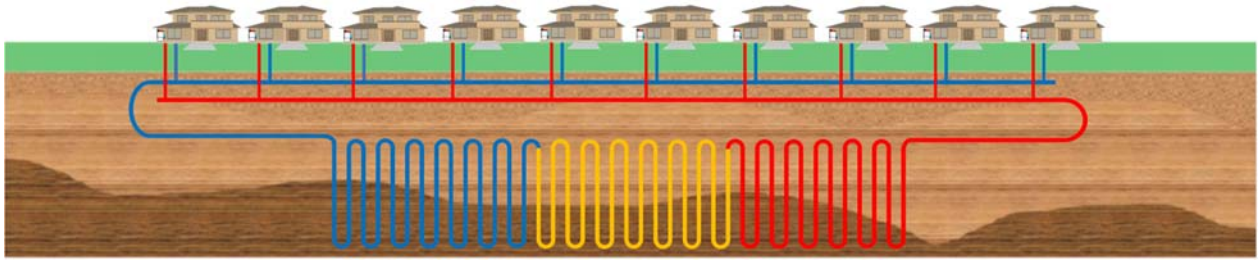


Figure 1. The concept of a shared a GHP system providing service to multiple homes.

In Q4 2018, the National Grid Project team continues to engage with Project participants to ensure proper system functions as the system enters the heating season. During this quarter, the Project team resolved the installation error for Heat Pump Unit Two at Glenwood Village. The Project team confirmed this resolution by monitoring the entering water temperature of adjacent units. Furthermore, the Project team continued to support NYSERDA's efforts in evaluating third-party ownerships of GSHPs. This quarterly report highlights key activities undertaken in Q4 2018 of this Project.[1]

[1] The Project was approved in the 2016 KEDLI Rate Case. *See* Case 16-G-0058 *et al*., *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corporation d/b/a National Grid for Gas Service et al*., Order Adopting Terms of Joint Proposal and Establishing Gas Rate Plans (issued December 16, 2016).

# 2. Highlights in Q4 2018

## 2.1 Major Task Activities

- High-Level Lessons Learned
  - The installed ground heat exchanger at Glenwood Village entered the heating season with heat pump water supply temperatures ranging from 43˚F to 72˚F in Q4 2018. In Q4 2018, the ground heat exchanger operated on average at 52˚F, which is within the system design parameters. Outdoor air temperature during this quarter ranged 6˚F to 77˚F.[2]
  - Ongoing data collection can be beneficial to validate system corrections. During this quarter, the Project team corrected the reversed piping at Glenwood Village Unit Two and verified proper system operations.
  - The Company is actively exploring the role for utilities to facilitate a greater market adoption of GSHPs. The Company believes it is well positioned to bring value to the market by leveraging its proven experience in accelerating a beneficial consumer product. The Company is aware of multiple regulatory implications which requires further exploration and discussion with the Commission. These discussions will provide the Company with an opportunity to develop a scaled-up offering and quickly accelerate the adoption of GSHPs.
- Customer Successes
  - There were no service interruptions or failures during this quarter.
  - The Project team received a customer inquiry through the Company's CrowdWeaving initiative on the topic of geothermal. The customer states the initiatve provides National Grid customers a platform to propose a technology, service, and/or product to enhance customer experience. The customer expressed interest in a geothermal service offered by the Company. Furthermore, the customer acknowledges the high upfront cost of geothermal systems, however, National Grid may offer an attractive product by "spreading out the initial cost."
- Regulatory Filings
  - The Project team filed the Q3 2018 Report with the Public Service Commission on October 31, 2018.
- Construction of GSHP Systems

  United Way of Long Island ("United Way")
  - Construction of the veterans group home in the Hamlet of Medford, New York (located in the Town of Brookhaven) ("Medford Project") is further delayed due to approval delays with various funding agencies. This in turn postpones the geothermal installation to Q2 2019.
  - Timeline requires a reset for installation to take place in Q2 2019 with construction planning to begin in Q1 2019.

[2] Historical weather data retrieved from www.wunderground.com. Accessed on January 17, 2018.

### 2.1.1 Stakeholder Engagement

- NYSERDA
  - The Project team continued to work with the New York State Energy Research and Development Authority ("NYSERDA") during Q4 2018 on data collection and project evaluations.
  - The Project team also engaged with NYSERDA to evaluate third-party ownership of GSHPs. The goal of the analysis study is to understand whether different permutations of third-party ownership models can remove the market barriers and increase adoption of GSHPs.

### 2.1.2 Participant Recruitment

- No ownership changes took place during this quarter.

### 2.1.3 Data Collection

- In consultation with NYSERDA and the Evaluation, Measurement and Verification ("EM&V") contractor, calculating cooling savings is preferred at the end of data collection at Glenwood Village.
- Performance data can be found in Appendix A.

### 2.2 Challenges, Changes, and Lessons Learned for Q4 2018

Please see Section 4.2

# 3. Next Quarter Forecast

In Q1 2019, the Project team will strive to achieve the following:

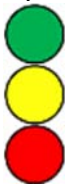
- The Project team will continue to communicate with United Way to stay informed on the construction timeline for the Medford Project and prepare the geothermal contractor for installation.
- Should the Medford Project gain timeline efficiencies, the Project team will work with United Way to revise the installation schedules and begin staging.
- The Company and the Project team will continue to work with NYSERDA on an accelerated analysis of various utility business models. The analysis will use existing market data, data collected by NYSERDA, and data from the Project to evaluate various business models. The analysis is expected to continue into Q2 2019.
- The Project team will estimate the objectives and metrics using the data collected from 2018 performance data described in Table 3 below.

## 3.1 Table of Checkpoints/Milestone Progress

Table 2. Major Milestones and Checkpoints.

| Checkpoint/Milestone | Anticipated Start - End Date Stated in the Project Implementation Plan | Revised Start-End Date | Status |
|---|---|---|---|
| **1. External Stakeholder Outreach** | 01/17-02/17 | Completed |  |
| **2. Recruitment and Participant Site Selection** | 03/17-06/17 | Completed |  |
| **3. Development of Service Agreement** | 03/17-09/17 | Completed |  |
| **4. Internal Planning & Operations** | 06/17-10/17 | Completed |  |
| **5. Procurement – Contractor Selection** | 04/17-08/17 | Completed |  |
| **6. Geothermal System Installation** | 07/17-10/17 | 07/17-5/19 |  |
| **7. Engineering Technical Assistance** | 11/17-08/19 | 01/18 |  |
| **8. Final Summary Report to the NYPSC** | 12/19 | 03/21 |  |

Key



On track

Delayed Start; At Risk of On-Time Completion; Or Over-Budget

Terminated/Abandoned Checkpoint/Milestone

Table 3. Objectives and Metrics.

| Focus Area | Objective | Checkpoint | Status |
|---|---|---|---|
| **Reduction in Carbon Emissions** | Target 6% reduction in carbon dioxide emissions | End of each year of operation | Q1 2019 |
| **Heating and cooling cost reductions** | Target 30% reduction in heating and cooling costs | End of each year of operation | Q1 2019 |
| **Natural gas and electric system benefits** | Target 0.5 kW/ton reduction of electricity for cooling and 100% in avoided natural gas demand for heating | Final Report | Final Report |
| **Economic Growth** | Monetized benefits should exceed economic costs | Final Report | Final Report |
| **Customer Satisfaction** | Participants exhibit high customer satisfaction scores | End of each year of operation | Q1 2019 |

# 4. Work Plan & Budget Review

Table 4. Budget Information Updated for Q4 2018.

| Project Task | 4th Quarter Actual Spend | Project Total Spend to Date | Project Budget | Remaining Balance |
|---|---|---|---|---|
| **CapEx** | | | | |
| | $0 | $0 | $0 | $0 |
| **OpEx** | | | | |
| Implementation | $22,319 | $408,260 | $450,000 | $41,740 |
| **Total** | **$22,319** | **$408,260** | **$450,000** | **$41,740** |

# 4.1 Project Work Plan

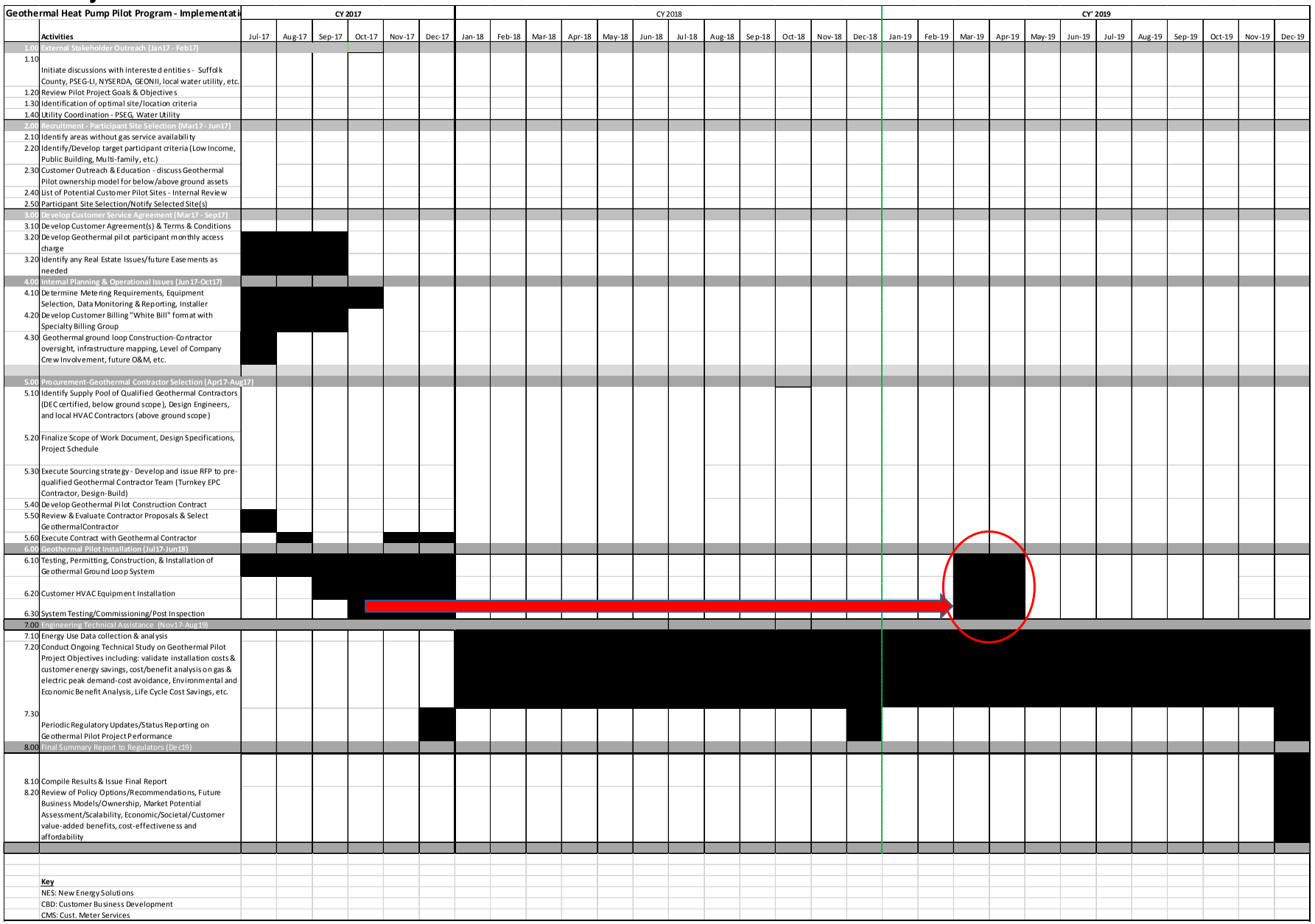





Exhibit ___ (FOH-4)
Page 10 of 13

## 4.2 Challenges, Changes, and Lessons Learned for Q4 2018

Table 5. Lessons Learned During the Quarter.

| Challenges, Changes, and Lessons Learned | What was the resulting change to Scope/Timeline? | Strategies to Resolve | Lessons Learned |
|---|---|---|---|
| **The underground loop operated effectively during the transition period from cooling to heating with no heat pump failures or interruption of service** | No change to scope or timeline | Not Applicable | During this quarter, the geothermal system at Glenwood Village transitioned into heating mode. Effectively, the system is providing thermal energy collected during the cooling season. |
| **Having data monitoring enabled on GSHPs provides real time information which can be used to verify system changes.** | No change to scope or timeline | Not Applicable | Data analytics can provide useful insights to verify system corrections. |

Exhibit ___ (FOH-4)
Page 11 of 13

# 5. Appendix A.

GSHP Performance Analysis

Table 6. The Monthly Average Heating COP from January to December 2018 at Glenwood Village.[3,4]

| Month In 2018 | 2017 Heating Degree days (Base 65) | 2018 Heating Degree days (Base 65) | Heat Pump Unit 1 | Heat Pump Unit 2 | Heat Pump Unit 3 | Heat Pump Unit 4 | Heat Pump Unit 5 | Heat Pump Unit 6 | Heat Pump Unit 7 | Heat Pump Unit 8 | Heat Pump Unit 9 | Heat Pump Unit 10 | Average COP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Jan** | 965 | 1167 | 2.1 | 3.2 | 3.3 | NA | 2.6 | 2.5 | 3.5 | 2.8 | 3.3 | 4.5 | 3.1 |
| **Feb** | 836 | 778 | 2.2 | 2.9 | 3.1 | NA | 2.4 | 2.3 | 3.3 | 2.7 | 2.7 | 3.1 | 2.7 |
| **Mar** | 929 | 851 | 2.2 | 2.8 | 3.4 | NA | 2.5 | 2.2 | 3.4 | 2.8 | 2.8 | 3.1 | 2.8 |
| **Apr** | 460 | 662 | 2.2 | 3 | 3.6 | NA | 2.5 | 2.4 | 3.5 | 2.8 | 2.9 | 3.2 | 2.9 |
| **May** | 301 | 190 | 3.3 | 5.6 | 5.3 | 2.6 | 3.1 | 4 | 4.4 | 4.9 | 4.5 | 4.1 | 4.2 |
| **Jun** | 84 | 89 | 4.2 | 5.7 | 5.8 | 6.6 | 5.5 | 5.4 | 6.1 | 5 | 5.7 | 6.6 | 5.7 |
| **Jul** | 5 | 10 | - | - | - | - | - | - | - | - | - | - | - |
| **Aug** | 13 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **Sep** | 72 | 39 | - | - | - | - | - | - | - | - | - | - | - |
| **Oct** | 614 | 365 | 2.4 | 3.7 | 4.6 | 5 | 3.1 | 2.4 | 4.4 | 3.8 | 5.4 | 5 | 4.0 |
| **Nov** | 1091 | 692 | 2.3 | 3 | 4.2 | 3.5 | 2.6 | 2.4 | 3.8 | 3.4 | 4.9 | 5.5 | 3.6 |
| **Dec** | 901 | 901 | 2.2 | 2.9 | 4.4 | 3.6 | 3 | 2.4 | 3.8 | 4.8 | 3.7 | 5.3 | 3.6 |
| **Avg.** | Total 6271 | Total 5747 | 2.6 | 3.6 | 4.2 | 4.3 | 3.0 | 2.9 | 4.0 | 3.7 | 4.0 | 4.5 | 3.6 |

[3] Note: 5, 6, 9, 10 had data gaps during January 2018.

[4] Past weather data were retrieved from Francis S. Gabreski Airport available on www.wunderground.com.



Exhibit ___ (FOH-4)
Page 12 of 13

Table 7. The Monthly Average Cooling EER from May to December 2018 at Glenwood Village.

| Month In 2018 | 2017 Cooling Degree days (Base 65) | 2018 Cooling Degree days (Base 65) | Heat Pump Unit 1 | Heat Pump Unit 2 | Heat Pump Unit 3 | Heat Pump Unit 4 | Heat Pump Unit 5 | Heat Pump Unit 6 | Heat Pump Unit 7 | Heat Pump Unit 8 | Heat Pump Unit 9 | Heat Pump Unit 10 | Average EER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **May** | 16 | 9 | 5.7 | 12.6 | 11.3 | 3.5 | 4 | 7.6 | 8.7 | 10.3 | 8.8 | 7.1 | 8 |
| **Jun** | 96 | 86 | 8.3 | 12.6 | 12.9 | 16.3 | 12.4 | 11.8 | 14.5 | 10.3 | 12.7 | 15.4 | 12.7 |
| **July** | 203 | 543 | 10.3 | 12.5 | 13.5 | 18.4 | 12.4 | 11.9 | 15 | 11.2 | 12.5 | 15.4 | 13.3 |
| **Aug** | 133 | 285 | 10.1 | 12.4 | 13.4 | 18.2 | 13.2 | 12 | 14.6 | 8.1 | 12.2 | 15.2 | 12.9 |
| **Sept** | 93 | 118 | 7.9 | 12.4 | 14 | 17.6 | 12.5 | 11.1 | 14.8 | 10 | 12.5 | 15.7 | 12.9 |
| **Oct** | 1 | 26 | 2.4 | 6.6 | 9.5 | - | 4.8 | - | - | - | - | - | 5.8 |
| **Nov** | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - |
| **Dec** | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - |
| **Avg.** | Total 542 | Total 1067 | 7.5 | 11.5 | 12.4 | 14.8 | 9.9 | 10.9 | 13.5 | 10.0 | 11.7 | 13.8 | 10.9 |

Exhibit ___ (FOH-4)
Page 13 of 13

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-5)**

**Newtown Creek Project Data Sheet**

# Newtown Creek

## Renewable Natural Gas Demonstration Project

Updated March 2019

### National Grid's commitment to sustainable energy solutions

National Grid is focused on animating the market and highlighting opportunities for the expanded use of renewable natural gas ("RNG"). In support of this effort, the Company developed the Newtown Creek demonstration project to prove the concept of RNG and share lessons learned for future RNG developers. National Grid will own, maintain, and operate a system to clean biogas generated from wastewater treatment to meet pipeline quality standards and then inject the RNG into KEDNY's gas distribution system for direct consumption. The project will help meet New York City's ("NYC") environmental goals while also demonstrating how energy providers and other stakeholders can collaborate to incorporate RNG into the supply portfolio to meet sustainability goals, enhance reliability and on-system supply, and meet growing energy demands.

Newtown Creek Wastewater Treatment Plant in Brooklyn, NY
Source: ©New York City Department of Environmental

### Project highlights

National Grid and the NYC Department of Environmental Protection ("DEP") have partnered to deliver RNG from the largest wastewater treatment plant in New York City. The facility will be one of the first projects in the United States that directly injects RNG into a local distribution system using biogas generated from a wastewater treatment plant and food waste. There are several reasons why the Newtown Creek Wastewater Treatment Plant provided a compelling location for this demonstration project:

- Once the project is operational, the wastewater plant will no longer flare biogas (600 to 800 million cubic feet in annual emission savings).
- In a separate partnership, DEP is working with Waste Management to incorporate processed food waste into the wastewater sludge at Newtown Creek, increasing biogas production and helping NYC meet its environmental goals.
- With the additional food waste, the project has the potential to produce enough RNG to heat over 5,000 NYC homes and reduce $CO_2$ emissions more than 90,000 metric tons (equivalent to removing nearly 19,000 cars from the road).

### Project development

Construction Timeline

Project construction began in July 2018 and completion is expected by the end of calendar year 2019. During project development three key challenges impacted the construction timeline:

- **Project Relocation:** In 2016, the Company identified an un-mapped sewer pipeline in the original construction footprint, resulting in the need to relocate the project. The relocation required an engineering plan redesign, which the Company completed in November 2017. Despite the timing challenges, relocation reduced total project costs that would have otherwise been incurred for sound mitigation, simplified construction management, and provided additional space for maintenance.

- **Local Permitting Approval:** The project relocation impacted local approvals, requiring National Grid to revise its licensing agreement with the NYC Economic Development Corporation ("EDC") and delaying receipt of final permits (*e.g.*, FDNY needed to review final design before approval). National Grid also had to seek approval from the

Newtown Creek Monitoring Committee, Community Board #1, and the Public Design Commission. By June 2018 the Company had secured all necessary permits and construction commenced shortly thereafter.

- **Wastewater Treatment Plant Repairs:** Repairs to the plant's Wiggins Bladder (*i.e.,* storage tank) also impacted the project schedule. Three years ago, DEP informed National Grid that biogas production at the plant was declining. After investigation, DEP identified several meters that needed to be replaced, as well as a leak in the plant's Wiggins Bladder, which is used to maintain steady biogas pressure. Without an operating Wiggins Bladder, National Grid's biogas recovery system would be unable operate. In 2016, the Wiggins Bladder in-service date was postponed by DEP due to projected costs overruns. Those issues have since been resolved and repairs have commenced.

Project Cost

As of December 2018, project costs were estimated at $32.9 million, having increased from the original project cost of $19.88 million based on a preliminary (50 percent) design. The difference in cost is largely attributed to design modifications and additional engineering requirements. For example, the Public Design Commission's requirements for the aesthetic appeal of the project, as well as the Company's risk analysis, required changes to system design. These design changes were not foreseeable at the time of the initial forecast. To offset project costs, the Company was able to secure a property tax abatement from NYC valued at approximately $0.8 million a year.

Anticipated Project Revenues

National Grid anticipates revenue both from the sale of the RNG and from monetizing the project's environmental attributes. With regard to the latter, National Grid issued a request for proposal ("RFP") seeking assistance in monetizing the project's environmental attributes; ultimately selecting Element Markets to assist with that effort. The primary markets for RNG in the United States are: 1) the Federal Renewable Fuel Standard ("RFS"); and 2) California's Low Carbon Fuel Standard ("LCFS"). In 2019 the value of RNG from food waste (classified as D5 under the RFS) is roughly $4/dth, and the value of RNG from wastewater (classified as D3) is roughly $26/dth. These values, however, vary due to market changes, and the Company expects significant variability in the market values over time. The LCFS currently provides a financial incentive of ~$5.70/dth, which can be additive to the RFS value if the RNG is ultimately sold to a transportation customer in California. The actual revenue generated from the project is highly dependent on the volume of biogas produced, what proportion of the volume designated as D3 or D5, and the price volatility of the RFS and LCFS markets.

The Company has developed a revenue mechanism to offset the project costs through the sale of natural gas produced from the project, as well as any revenues realized from monetizing the associated environmental attributes. Initially, the Company will include a revenue estimate of approximately $1.9 million per year in the KEDNY rate case revenue forecast, which represents $1.0 million from the sale of the gas and $0.9 million from the sale of environmental attributes. The Company proposes to true-up the actual revenues from gas sales and environmental attributes, such that any variances will be deferred for future refund to (or recovery from) KEDNY customers. Any revenues realized above the level necessary to fully reimburse customers for the project costs will be shared evenly between customers and NYC. National Grid will track these costs on an annual basis and compare to the project's cumulative revenue requirement, with the fifth year after operation being the first year of any revenue sharing with the City in the event customers have been fully reimbursed. Revenue sharing will then be assessed every year, for the remainder of the project.

**Additional 2019 rate case considerations**

In the KEDNY/KEDLI rate case, the Company intends to seek elimination of the $1.6 million annual exclusion imposed as part of the 2016 KEDNY/KEDLI rate case. The exclusion was an estimate of the property taxes on the total project cost at the time the Companies filed the 2016 rate case. Following that case, National Grid worked with the NYC Industrial Development Authority ("IDA") to establish whether the project could receive a full property tax abatement for the updated project costs. The IDA determined that the property tax abatement should reflect the project costs estimated at the time National Grid was offered abatement (*i.e.*, the project would receive full tax abatement based on the 2012 project estimate of $14.4 million); altering the tax abatement to reflect the updated project costs would set precedent for other projects to request an increase of their property tax abatements if costs increased. National Grid has reduced the property tax forecast in the revenue requirement to reflect the IDA's decision.

National Grid is also proposing a reduction in the depreciable life of the project from 40 years to 20 years. A 20-year depreciable life for the project is consistent with the current 20-year term of the agreement between the Company and DEP.

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-6)**

**Power-to-Gas Demonstration Project Data Sheet**

**Program Title:** Power-to-Gas Demonstration Project

Description:

Keyspan Gas East Corporation d/b/a National Grid ("KEDLI" or the "Company"), in partnership with the Department of Energy's National Renewable Energy Laboratory ("NREL"), New York City ("NYC"), and Electrochaea, proposes a power-to-gas ("P2G") demonstration project analyzing the ability to use renewable energy to create renewable natural gas ("RNG"). The Company requests $3.5 million to complete project engineering and design studies, as well as to develop and assess overall project cost. The initial development phase is estimated to take three years to complete – a prudent first step toward implementing a full scale P2G demonstration. Upon completion of the studies and legal agreements, the Company will issue a request for proposal ("RFP") for a turnkey project. In addition, the Company will file a request with the Commission for approval to move forward with the project and for cost recovery.

The project objective is to demonstrate the technical and economic potential of converting excess renewable electricity to hydrogen or synthetic methane (*i.e.*, RNG) and utilizing the existing natural gas network to deliver the energy. To do so, the project will bring together existing hydrogen production technology, an electrolyzer, and cutting-edge methanation technology, a bioreactor. If successful, the Company believes the P2G demonstration project will prove to be a scalable method of producing pipeline quality gas or RNG from electricity, water, and a carbon waste stream. To further scope the opportunity, the Company held preliminary discussions with NREL, NYC and Electrochaea, and is working with NYC to develop technical teams to support the project.

Program Justification:

The gas network has an important role to play in New York's low-carbon future, meeting customers' energy requirements through a decarbonized energy stream. This transition will include delivering RNG from biomass, a source of energy that is commercially available today, and P2G technology. As more renewable generation is deployed in New York, P2G can play a critical role in maximizing utilization of these intermittent resources. With P2G, the gas network can store excess renewable electricity that would have otherwise been curtailed, providing large capacity, seasonal storage. In doing so, P2G also can deliver low-carbon fuels to some of the most difficult sectors to decarbonize, including heavy-duty transportation, industry, and heat.

*Gas Decarbonization*. P2G expands the potential of gas distribution system decarbonization beyond RNG produced from biomass. Decarbonizing the gas carried by the distribution system presents an opportunity to rapidly lower the carbon intensity of end uses fueled by natural gas, without the need to build out new infrastructure and with little impact to customers (*i.e.*, it achieves carbon savings without requiring customers to replace existing appliances or perform deep building renovations). The proposal is additive to the work National Grid has already undertaken to promote RNG development, such as the Newtown Creek demonstration project. Moreover, as New York moves towards increased clean energy targets (*e.g.*, 9 GW of offshore wind) the potential of P2G will likewise grow.

*Energy Storage*. As New York deploys additional renewable generation to meet clean energy targets, matching energy storage with supply and demand will become increasingly important. Injecting methane produced from P2G into the natural gas distribution system provides a long-term form of energy storage, capable of shifting energy by weeks or even months. Stored energy, in the form of methane from P2G, can be treated as traditional natural gas and does not face the same blending challenges as hydrogen. Additionally, this process takes advantage of a widespread, utility scale network that does not face the same charge constraints as traditional batteries (*i.e*., the natural gas network can be continuously charged with methane from P2G).

P2G Demonstration Project Cost Breakdown:

Estimated development costs are $3,525,000

| | FY2021 | FY 2022 | FY 2023 | FY 2024 |
|---|---|---|---|---|
| Front end engineering | $ 300,000 | | | |
| Detailed engineering | | $ 1,500,000 | | |
| Architectural compliance | | | $ 200,000 | |
| NREL | $ 25,000 | | | |
| FDNY | | | $ 200,000 | |
| Legal fees | $ 25,000 | $ 25,000 | $ 25,000 | $ 25,000 |
| Contingency | $ 250,000 | $ 250,000 | $ 250,000 | $ 250,000 |
| In house | $ 50,000 | $ 50,000 | $ 50,000 | $ 50,000 |
| **Total Development Fees** | **$ 650,000** | **$ 1,825,000** | **$ 725,000** | **$ 325,000** |

Alternatives

- Study to assess P2G potential in the Northeast, based on state renewable portfolios and the economic benefits of P2G.
- Convene stakeholder working group to develop a whitepaper that outlines the role of RNG, including P2G, in New York's future energy system.
- Focusing near-term efforts on RNG from biomass.

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-7)**

**Detailed Program Descriptions including Proposed Modifications to KEDNY and KEDLI's Current Economic Development Grant Programs**


# Economic Development Grant Programs

# KEDNY AND KEDLI ECONOMIC DEVELOPMENT GRANT PROGRAM PROPOSAL

## 1. Overview

The Brooklyn Union Gas Company d/b/a National Grid NY ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid ("KEDLI") (collectively, the "Companies") propose changes to the KEDNY and KEDLI Economic Development grant programs that are intended to support the Companies' larger "Future of Heat" initiative, make the programs more responsive to customer needs, and generate additional regional economic development benefits in their service territories.

## 2. Proposed New Program

The Companies further propose to create a new economic development grant program, "Economic Development and The Future of Heat" that would provide matching grants of up to $500,000 to fund projects that involve an investment in non-pipeline alternatives ("NPAs") to traditional natural gas delivery infrastructure, installation of emerging and efficient natural gas utilizing technologies, and the creation of new jobs and new capital investment in the service territory economy.

## 3. Proposed Changes to Existing Programs

Encouraging the use of renewable natural gas

- For the Capital Investment Incentive, Industrial Building Redevelopment Program and the Cinderella Program, the Companies are proposing to add the following funding and eligibility guideline: "Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements."

Strengthening the connection between energy efficiency and economic development

- For the Capital Investment Incentive and Industrial Building Redevelopment Program the Companies are proposing to add the following funding and eligibility guideline: "Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives."

Capital Investment Incentive

- The Companies are proposing to modify the list of eligible gas equipment as follows. "Customer costs associated with equipment required to establish or expand natural gas service including, but not limited to, headers, pressure boosters, header pads or capital investment required to meet local building codes related to natural gas."
- The Companies are proposing to add aquaculture to the list of eligible industry sectors, as well as any project that becomes eligible for Excelsior Jobs Program tax credits from New York State.
- The Companies are proposing to include the service classifications for natural gas vehicle fueling stations in the list of eligible customer classes.

Cinderella Program

- For mixed-use projects, the Companies are proposing to allow developments in which the commercial space has been 100 percent vacant for a minimum of 1 year to be eligible for funding, subject to all other program eligibility requirements.

## 4. Detailed Program Descriptions

The following attachments include detailed program descriptions for both KEDLI and KEDNY, with the proposed changes to existing programs identified in red.

# Proposed KEDLI Program Descriptions

nationalgrid

**ECONOMIC DEVELOPMENT AND THE FUTURE OF HEAT**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**

National Grid is committed to providing a wide range of energy solutions to assist businesses in our service territory, and helping New York State reach its aggressive clean energy goals. The Economic Development and Future of Heat program will support economic development by investing in technologies that will enable customers to become more efficient and productive while contributing to New York's ongoing energy transformation.

**Economic Development and the Future of Heat program** provides matching grants of up to $500,000 to fund projects in the National Grid Downstate service territory that involve an investment in "non-pipeline alternatives" to traditional natural gas delivery, installation of emerging and efficient natural gas utilizing technologies, and the creation of new jobs and new capital investment in the service territory economy.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York franchise territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:

- Be the owner or developer of the eligible site or building with the endorsement of a state, regional or local development agency **or**
- Be a municipality or not-for-profit (501C3 or 501C6) economic development agency responsible for the development of the site or building; and
- Have the documented support of a state, regional or local economic development agency

To be eligible for the **Customer Track**, the **facility (business)** must:

- Be located in the National Grid's downstate New York service territory; **and**
- Be currently served under or expected to be served under a non-residential national grid rate service classification
- Be used for business purposes that can be classified in one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution centers
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations
  - Regional/national administrative centers or headquarter facilities
  - Agri-Business and/or Aquaculture
  - Projects that become eligible for Excelsior Jobs Program tax credits from New York State, regardless of their industry classification; **and**

- Be undertaking a business attraction or expansion project generating new jobs and investment in the National Grid service territory; **and**
- Result in the installation of a non-pipeline alternative to traditional gas service or emerging natural gas technology including but not limited to geothermal, solar thermal, thermal storage, combined heat and power, fuel cells, biomass, , microgrids, anaerobic digestion, and thermal cooling/chilling; **and**
- Be receiving funding through a federal, state, local or utility clean energy program;

To be eligible for the **Community Track**, the **project** must:

- Be located within the National Grid Downstate New York service area; **and**
- Be currently served under or expected to be served under a non-residential national grid rate service classification; **and**
- Result in the installation of a non-pipeline alternative to traditional gas service or an emerging natural gas technology including but not limited to geothermal, solar thermal, thermal storage, combined heat and power, fuel cells, biomass, cogeneration, micro CHP, microgrids, anaerobic digestion, and thermal cooling/chilling**; or**
- Be undertaking a feasibility analysis related to such an installation; **and**
- Have a regional economic development sponsor; **and**
- Be receiving funding through a federal, state, local or utility clean energy program or; **and**
- Involve redevelopment of a multiple-building complex that will create or retain a minimum of 250 jobs; **and**
- Be used for – or have a marketing plan to attract -- commercial, industrial or mixed use businesses. For mixed use facilities, the total square footage associated with retail, housing and community space must not exceed 25 percent of the total project square footage.

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

The maximum allowable grant award for the Customer Track is $250,000 and the maximum allowable grant award for the Community Track is $500,000. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award. If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Grant amounts will be determined based on the size of the **total** investment made in the project/facility (including energy and non-energy related investments) as follows:

| Total Investment | Total Avail Funding not to Exceed: |
|---|---|
| $50,000 to $250,000 | $25,000 |
| $250,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| Above $5 Million | $250,000 |
| Above $10 Million* | $500,000 |

*Community Track Only

- Program funds may only be used to offset twenty-five percent (25%) of project costs (3:1 funding match required).
- Grant program funds must not exceed applicant's equity or repayable debt contribution to the project
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Future of Gas and Economic Development Program please:

Complete the program application online; and
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at* Karen.Mousaw@nationalgrid.com.

nationalgrid

**CAPITAL INVESTMENT INCENTIVE**

**Program Summary**

The **Capital Investment Incentive Program** provides funds to help offset customer costs associated with upgrading natural gas infrastructure to accommodate a business expansion or new construction project. Applicants must demonstrate that they are unable to secure sufficient funding for the project through federal, state, or local economic development programs. Application requests may include, but are not limited to the following:

- Improvements to National Grid's natural gas system, such as line extensions or upgrades to existing gas delivery infrastructure, that require a customer contribution in aid of construction.
- Customer costs associated with conversion from oil or other fuels to National Grid natural gas delivery service.
- Customer costs associated with equipment required to establish or expand natural gas service, including but not limited to headers, pressure boosters, header pads or capital investment required to meet local building codes related to natural gas utilization.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below, prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:

- Be the customer of record (owner or lessee) of an eligible facility or prospective eligible facility;
- Demonstrate efforts to obtain state & local economic development incentives for the facility;
- Demonstrate the ability to attract and/or retain jobs and generate capital investment in the eligible facility; and,
- Make a capital investment (building, machinery and or equipment) that requires natural gas infrastructure improvements.

To be eligible for this program, the **facility (business) or prospective facility must:**

- Be located in National Grid's downstate New York service territory;
- Demonstrate Industrial Development Agency (IDA) or other public development agency support for the project;
- Be currently served under – or expected by National Grid to be served under – one of the following natural gas service classifications SC-2A, SC-2B, SC-4, SC-5-2A, SC-5-2B, SC-5-9, SC-7, SC-12, or SC-13; SC-9 **and**,
- Be used for business purposes that can be classified in one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution centers
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations
  - Regional/national administrative centers or headquarter facilities
  - Agri-Business and/or Aquaculture

- Projects that become eligible for Excelsior Jobs Program tax credits from New York State, regardless of their industry classification

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

Grant amounts are determined based on the **total** capital investment being made in infrastructure, plant & equipment (including energy and non-energy related investments) as follows:

| Total Capital Investment | Total Available Funding not to Exceed: |
|---|---|
| $100,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $250,000 |
| $5 Million and above | $500,000 |

Program funds cannot represent more than 30% of the total capital investment costs (energy infrastructure and other related capital improvements).

Program funds cannot exceed the final cost of energy related infrastructure Improvements related to the project.

Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.

Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Natural Gas Capital Investment Incentive Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**COOPERATIVE BUSINESS RECRUITMENT PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
Regional, county, and local economic development organizations have limited resources to devote to "marketing" their communities to attract business investment and jobs. This is true even of counties that possess extraordinary assets for business attraction – such as prime industrial sites or available buildings and infrastructure. While the cost of business attraction activities typically relies on local and regional resources, community expectations tend to be very high in terms of success in recruiting wealth-generating businesses.

The **Cooperative Business Recruitment Program** provides incremental matching funds for cooperative marketing initiatives between National Grid and regional or local economic development partners.

Application requests may include, but are not limited to, the following:
- The creation of collateral material and direct mail campaigns;
- Sales initiatives related to major business development events, such as Industrial Asset Management Forums, Area Development Consultants Forums, and other events where site location consultants and corporate real estate executives gather;
- Support research and assistance with site selection familiarization tours, industry trade shows, and sales missions;
- Sales initiatives directed at industry trade groups; and
- Support for the creation and distribution of industry-specific publications.
- Advertising and public relations activities.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:
- Be a regional or local economic development organization in the National Grid downstate service territory; **and**
- Provide economic development business attraction services to a community or region located within the National Grid downstate service territory.

To be eligible for this program, the **marketing project** must:
- Promote community attributes or resources that represent a major asset for business attraction;
- Be targeted to decision makers who can influence the attraction of new jobs and investment to the National Grid downstate New York service territory; **and**
- Be designed to attract new business, investment, and jobs to the downstate New York National Grid service territory, based on the following factors:

- The extent to which the project compliments (and not duplicates) other local, regional, and state business attraction efforts;
- The economic development potential of the asset that is being promoted;
- The project sponsor's ability to accomplish and sustain the effort of the project;
- The project sponsor's ability to leverage federal, state, and local matching funds; and
- The extent to research proposed does not duplicate previous research and is "actionable" (*e.g.* refining the targets, messages, materials and activities generated by the research proposed).

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application. Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- National Grid funds for cooperative projects must be matched on a 1:1 basis.
  - Maximum grant per project is $50,000.
  - Grant funds cannot be applied to past business attraction efforts.
  - Collateral materials must recognize National Grid's contribution.

**How to Apply**

To apply for the Cooperative Business Recruitment Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**NATURAL GAS MANUFACTURING PRODUCTIVITY PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
Manufacturing employs over 550,000 New Yorkers and contributes $61 billion annually to New York State's GDP. Every manufacturing job creates more than 2.5 related jobs in other sectors, and every dollar spent generates an additional $1.37 in economic activity.* Small and medium sized downstate New York manufacturers are challenged by high costs and regulatory pressures. They must continually improve productivity and performance to remain competitive in the global economy. In order to grow, they must develop new products and improve their return on investment from sales and marketing activities by finding new customers, markets, and export opportunities. This program has been developed in partnership with the Regional Technology Development Centers ("RTDC"s) in New York State, and will be delivered in conjunction with these RTDCs.

**Source: Manufacturers Association of Central New York*

The **Manufacturing Productivity Program** provides matching grants of up to $15,000 or 40% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to "lean manufacturing" projects or manufacturing assistance projects that result in eliminating waste and increasing productivity on the "shop floor" and in the office.

Further, the program provides matching grants of up to $15,000 or 50% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to growth-targeted activities that will result in greater utilization of manufacturing capacity.

Finally, the program provides matching grants of up to $40,000 or 60% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to projects that combine and coordinate the productivity and growth activities described above.

Grant awards will be funded in conjunction with RTDCs upon verification of increased productivity and capacity, improvement of the bottom-line and pursuit of additional sales with the same work force. Priority consideration will be given to projects that involve energy efficiency, energy utilization, and/or environmental solutions.

Applications for matching grant assistance must meet the following program requirements.

**Minimum Program Requirements**

To be eligible for this program, the **applicant** must:

- Be an SC-2-1, SC-2-2, SC-5A, SC-6C, SC-17, SC-17-2-1, SC-17-2-2, SC-18-5A, or SC-18-6C customer in good standing within National Grid's downstate New York gas service territory;
- Be a business that is classified in the North American Industry Classification System (NAICS) as Manufacturing (NAICS codes 31, 32 or 33);
- Execute an agreement that commits top management to the processes that result in the productivity and development improvements articulated in this program distribution; **and**

- Provide evidence of funding from the company and other sources that is sufficient to complete the proposed project. The company must provide a minimum of 25% of the total funding from its own capital.

*NAICS classifications can be found online at* http://www.census.gov/epcd/www/naics.html

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the project must accomplish one or more of the following:

- Optimize the current facility
- Increase machine effectiveness
- Improve product quality
- Reduce costs
- Reduce lead times
- Improve process flow
- Increase inventory turns
- Expand markets
- Develop new customers
- Develop new products

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

**How to Apply**

To apply for the Manufacturing Productivity Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at* Karen.Mousaw@nationalgrid.com.

nationalgrid

**BROWNFIELD REDEVELOPMENT ASSISTANCE PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
Nearly every community in New York State is affected by brownfield sites and abandoned properties. Contaminated and abandoned properties exist in big cities, small towns, sprawling suburbs, and the country side. Left untouched, brownfields pose environmental, legal and financial burdens on a community and its taxpayers. However, after cleanup, these sites can again become the powerful engines for economic vitality, jobs and community pride that they once were.

The **Brownfield Redevelopment Assistance Program** provides grants to fund utility related infrastructure improvements, demolition, and other costs that are necessary to progress the redevelopment of a *brownfield* site or abandoned building. Application requests may include but are not limited to the following:

- Demolition that results in the clean-up and re-use of a contaminated site or building;
- Gas infrastructure improvements; and,
- Costs associated with the local match for NYS DEC Environmental Restoration Program (ERP) and the Brownfield Opportunity Area Program (BOA).
- Phase I and Phase II environmental site assessments

Priority will be given to site or building redevelopment projects that have obtained a sufficient amount of funding to fulfill the project redevelopment goals.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:
- A municipality and/or its authorized development corporation, **or**
- A 501(c)3, 501(c)6, or 501(c)4 corporation, working in tandem with a municipality and/or its Industrial Development Agency or Local Development Corporation, **or**
- Be the owner or developer of the eligible site with the endorsement of the municipality

To be eligible for this program, the **project (site or building)** must:
- Receive natural gas service from National Grid;
- Have a viable commercial or industrial end use strategy for the site, based on some or all of the following factors:
  - Physical condition of building or site
  - Potential for land acquisition or site control
  - Regional economic impact of successful reuse

- Demonstrated ability to accomplish and sustain reuse as a commercial or industrial site.
- Demonstrated ability to obtain federal, state and other funding
- Demonstrated ability to market the site or building to attract economic investment
- Eligibility for state and federal development funds for the total project costs
- Strength of development partnerships and community support

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- The maximum grant allowable for a project is $250,000
- Program funds may be used for up to 25% of the eligible costs of a project
- The maximum program funds that can be allocated to the completion of both Phase I and Phase II Environmental investigations and other preliminary site/building investigations is $25,000; this is included in the maximum allowable grant of $250,000.
- National Grid funds may be used as matching funds for other public grants. In this instance, National Grid will commit dollars contingent upon the successful awarding of the grant, but will not release funding until all required project funding is in place.

**How to Apply**
To apply for the Brownfield Redevelopment Assistance Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**INDUSTRIAL BUILDING REDEVELOPMENT PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
National Grid's downstate New York service territory has many vacant and underutilized buildings or complexes (integrated groups of buildings) that were originally built for and occupied by a single, large end-user. These buildings and complexes are unlikely to attract single end-users, so they must be marketed as multi-tenant, industrial properties. One of the challenges to the marketability of these properties is the expense of separating the utilities.

The **Industrial Building Redevelopment Program** provides grants of up to $250,000 (based on the amount of capital investment per the chart below) to property owners who are upgrading natural gas infrastructure to return these properties to active industrial use.

| Total Capital Investment | Available Funding Not to Exceed |
|---|---|
| Under $1Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| $5 Million and above | $250,000 |

**Minimum Program Requirements:** *Please review the program requirements and guidelines below, prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:
- Be the owner, duly authorized representative of the owner or contract purchaser of the eligible facility;
- Demonstrate a willingness and ability to actively market the building to out-of-state companies;
- Obtain Industrial Development Agency (IDA) or other public development agency support for the project.

To be eligible for this program, the **project** must:
- Be a building or integrated group of buildings that were at one time occupied by a single user;
- Receive natural gas service from National Grid;
- Be vacant or underutilized (underutilized means that at least 50% of the usable space is vacant);
- Be at least **50,000** square feet or larger;
- At project conclusion, provide a certificate of occupancy or a certificate of compliance from the local building codes department; and,

- Be suitable for use by one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution center
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Program funds may only be used to offset 50% of costs associated with upgrading, segregating, or otherwise making the property's gas infrastructure suitable for occupancy by multiple tenants. This could include costs associated with planning, design, engineering, and construction costs associated with new infrastructure.
- Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.
- Priority will be given to applicants who furnish aggressive marketing plans designed to attract new businesses to the completed project.
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Industrial Building Redevelopment Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@national.com.*

nationalgrid

**CLEANTECH INCUBATION**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
This program supports the development of a self-sustaining entrepreneurial and innovation "ecosystem" in downstate New York that will stimulate and support high growth new businesses generating new jobs and new investment in the National Grid service territory. National Grid has created this program to support initiatives that facilitate formation of new ventures or growth of high potential small ventures and also to make buildings more marketable for the creation of new jobs in the clean tech industry and other advanced technology industry sectors.

The **CleanTech Incubation Program** provides grants up to $250,000 to support entrepreneurial ventures, connect new companies to key resources, address their critical problems, and assist them in capitalizing on emerging opportunities. Application requests may include but are not limited to the costs associated with market research; commercialization efforts and consulting support that includes entrepreneurs-in-residence (EIR's); training; and costs related to performance tracking and documentation of lessons learned (for replication purposes).

Priority will be given to applicants who have undertaken similar projects elsewhere and concluded them successfully.

The **Program** also offers matching grants of up to $250,000 for the fit up of buildings that provide business incubation services for companies in the clean tech industry sector based on the following levels of capital investment as follows:

| **Total Capital Investment** | **Available Funding Not to Exceed** |
|---|---|
| Under $1Million | $50,000 |
| $1Million to $5Million | $100,000 |
| $5Million and above | $250,000 |

**Minimum Program Requirements:**
*Program assistance is only available to customers in good standing located within the National Grid downstate New York franchise territory. Applicants must be current in payments with National Grid, or have executed a deferred payment agreement, and be operating under a franchise agreement with the company.*

To be eligible for the entrepreneur venture support, the **applicant** must:
- Be a NYS Center for Advanced Technology (CAT), or Center of Excellence (COE), or a 501(c)3, 501(c)4 or 501(c)6 corporation dedicated to entrepreneur support.
- Have experience and a track record of successful performance in economic development and entrepreneurship, **and**
- Have a history of working and interacting with entrepreneurs and organizations that support entrepreneurs;

To be eligible for the entrepreneur venture support, the **Project** must:

- Have a physical location in National Grid's downstate NY service territory that receives electric and/or natural gas service **and**:
- Focus on business-related issues that facilitate the creation, sustainability and/or growth of for-profit entrepreneurial ventures **and;**
- Include hands-on implementation assistance involving direct interaction with entrepreneurs and their ventures **and;**
- Include metrics and a tracking method related to increases in entrepreneurial activity including ventures started or growth in existing ventures, jobs created and/or retained, new capital investment and/or revenue growth **and;**
- Be based on a replicable model with a final report that outlines lessons learned from the funded and substantiated financial results **and;**

To be eligible for the building fit-up assistance, the **applicant** must:

- Be the owner of the eligible site or building **or**
- Be a municipality or not-for-profit (501C3 or 501C6) economic development agency responsible for the development of the site or building.

To be eligible for building fit-up assistance the **Project** must:

- Have a physical location in National Grid's downstate NY service territory that receives natural gas service **and**;
- Have existing infrastructure that is a barrier to new investment. **and;**
- Include a plan for marketing the building to Clean Tech and other advanced technology industries

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

- National Grid funds may only be used to offset 50% of project costs (minimum 1:1 funding match required).
- Funding will be limited to one application per organization per year.
- Entrepreneur funding is intended to provide one time support for new entrepreneur initiatives.
- A maximum of 10% of the total grant award can be given to any individual entrepreneur or company.
- Building fit-up funds can only be used to offset the costs for building drawings, design work, and/or construction

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds. Grant amounts listed are the maximum allowable award for each program. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

**How to Apply**

To apply for the CleanTech Incubation Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.

nationalgrid

**CINDERELLA PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
For more than forty years, National Grid's Cinderella economic and community development program has helped to revitalize local communities throughout Brooklyn, Queens, Staten Island and Long Island. The downstate New York service territory of National Grid includes vacant buildings, urban corridors, and commercial districts with unrealized development potential and often with excess utility infrastructure and capacity. This program is designed to assist communities in promoting "smart growth" through the redevelopment of those underutilized assets, to help improve their economic viability, attract new investment, and capitalize on their distinct development potential.

The **Cinderella Program** provides grants to municipal and non-profit development corporations to offset a portion of the costs of redeveloping and revitalizing critical commercial districts and urban corridors.

Application requests may include, but are not limited to, the following:

- Development of pre-construction documents that advance an existing community accepted design plan, site preparation, and construction of commercial and industrial adaptive re-use projects; and
- Renovation and rehabilitation of vacant commercial, industrial, and mixed-use buildings
- New construction on parcels where re-use is not possible/practical without demolition of the existing structure

Priority projects will be sustainable and demonstrate use of green building technologies/LEED certified initiatives (Leadership in Energy & Environmental Design) and Greening USA's 12 Traits of Sustainability. Preference will also be given to customers converting to innovative natural gas technologies. This program is not intended to provide funding related to government operations or services. Projects must be located in an underutilized central business district, commercial area or targeted redevelopment area. The building itself must be either 100% vacant or at least 90% vacant and identified as a critical redevelopment project. Projects must demonstrate job creation and the ability to stimulate ancillary public and private investment will be viewed favorably in the evaluation process. Applications showing commitments from public funding resources such as the Governor's Office of Small Cities and Empire State Development are encouraged.

**Minimum Program Requirements:** *Please review the following program requirements and guidelines carefully. They will help you decide whether you want to apply for this program.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York franchise territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:

- A municipality and/or its authorized development corporation; **or**
- A 501(c)(3), 501(c)(6), or 501(c)(4) corporation, with a letter of support from the municipality and/or its Industrial Development Agency or Local Development Corporation; or lead community development organization **or**
- Be the owner or developer of the eligible site with the endorsement of the municipality, or the lead community development organization

To be eligible for this program, the **project** must:

- Receive natural gas service from National Grid or demonstrate a commitment to convert to National Grid gas service;
- Be located in a central business district, commercial corridor or targeted building, or redevelopment neighborhood
- Show evidence of private sector job creation/retention and capital investment;
- Reside in a building in which the commercial space has been 100 percent vacant for a minimum of 1 year; ~~that is completely vacant OR within a targeted redevelopment area in which fifty percent (50%) of the commercial, and mixed use buildings are 100% vacant. The subject building must be at least 90% vacant;~~ and
- Upon project completion show evidence of certificate of occupancy

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline the expectations of the grant program and the conditions upon which funds will be released.

Grant amounts listed are the maximum allowable award for each program. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Funding for eligible mixed-use projects will be appropriately scaled based on the proportion of commercial versus residential square footage and/or construction costs.
- Grant amounts will be determined based on the size of the **total** capital investment made in the project/facility (including energy and non-energy related investments) as follows:

| Total Capital Investment | Total Avail Funding not to Exceed: |
|---|---|
| $50,000 to $250,000 | $25,000 |
| $250,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| Above $5 Million | $250,000 |

- Program funds will not exceed fifty percent (50%) of eligible costs
- Projects demonstrating *Greening USA's* "12 Steps of Sustainability" or receiving some level of LEED certification will receive priority consideration and the possibility of additional funding.
- Preference will also be given to customers converting to innovative natural gas technologies.
- Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Cinderella Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**SUSTAINABLE GAS AND ECONOMIC DEVELOPMENT PROGRAM**

**The Sustainable Gas and Economic Development Program** will fund a limited number of projects in the National Grid service territory that demonstrate sustainable gas technologies while producing significant economic development benefits for the region. The program will provide matching grants of up to $250,000 for collaborative projects that involve a downstate New York research institution, one or more sustainable gas or gas transportation technologies and a regional economic development sponsor. Eligible technologies include, but are not limited to, those that produce or utilize pipeline quality gas from biogas resulting from anaerobic digestion or gasification of waste materials for delivery in local distribution systems or use in natural gas vehicles.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:

- A regional economic development entity in National Grid's downstate New York service territory; **or**
- A University-based research organization with the endorsement of the authorized municipality where the project is taking place; **or**
- A 501(c)(3), 501(c)(6), or 501(c)(4) corporation, working in tandem with a municipality, university, or regional economic development organization.

To be eligible for this program, the **project** must:

- Be located within the National Grid downstate NY service area;
- Involve development and deployment of sustainable gas or gas transportation technologies such as bio-methane or gas blends processed to pipeline quality standards produced from landfill gas recovery, municipal wastewater operations, municipal solid wastes, wood and pulp wastes, farm or dairy wastes, or any other renewable material that is both produced and processed in NY State for delivery in a local distribution system or use in natural gas vehicles;
- Obtain matching funds on at least a 4:1 basis from other sources;
- Include involvement of a regional university research institution;
- Have one or more sustainable gas or related sustainable gas technology partners;
- Have a regional economic development sponsor; **and**
- Show specific evidence of regional economic development benefits by**:**
  1. Creating an asset that will enhance regional business attraction or expansion efforts; **or**
  2. Serving as a learning center for sustainable gas or sustainable gas transportation technologies.

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

The maximum allowable grant award for this program is $250,000. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Program funds may only be used to offset twenty percent (20%) of project costs (4:1 funding match required)

**How to Apply**

To apply for the Sustainable Gas and Economic Development Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com*

# Proposed KEDNY Program Descriptions

nationalgrid

**ECONOMIC DEVELOPMENT AND THE FUTURE OF HEAT**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**

National Grid is committed to providing a wide range of energy solutions to assist businesses in our service territory, and helping New York State reach its aggressive clean energy goals. The Economic Development and Future of Heat program will support economic development by investing in technologies that will enable customers to become more efficient and productive while contributing to New York's ongoing energy transformation.

**Economic Development and the Future of Heat program** provides matching grants of up to $500,000 to fund projects in the National Grid Downstate service territory that involve an investment in "non-pipeline alternatives" to traditional natural gas delivery, installation of emerging and efficient natural gas utilizing technologies, and the creation of new jobs and new capital investment in the service territory economy.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York franchise territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:

- Be the owner or developer of the eligible site or building with the endorsement of a state, regional or local development agency **or**
- Be a municipality or not-for-profit (501C3 or 501C6) economic development agency responsible for the development of the site or building; and
- Have the documented support of a state, regional or local economic development agency

To be eligible for the **Customer Track**, the **facility (business)** must:

- Be located in the National Grid's downstate New York service territory; **and**
- Be currently served under or expected to be served under a non-residential national grid rate service classification
- Be used for business purposes that can be classified in one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution centers
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations
  - Regional/national administrative centers or headquarter facilities
  - Agri-Business and/or Aquaculture
  - Projects that become eligible for Excelsior Jobs Program tax credits from New York State, regardless of their industry classification; **and**

- Be undertaking a business attraction or expansion project generating new jobs and investment in the National Grid service territory; **and**
- Result in the installation of a non-pipeline alternative to traditional gas service or emerging natural gas technology including but not limited to geothermal, solar thermal, thermal storage, combined heat and power, fuel cells, biomass, , microgrids, anaerobic digestion, and thermal cooling/chilling; **and**
- Be receiving funding through a federal, state, local or utility clean energy program;

To be eligible for the **Community Track**, the **project** must:

- Be located within the National Grid Downstate New York service area; **and**
- Be currently served under or expected to be served under a non-residential national grid rate service classification; **and**
- Result in the installation of a non-pipeline alternative to traditional gas service or an emerging natural gas technology including but not limited to geothermal, solar thermal, thermal storage, combined heat and power, fuel cells, biomass, cogeneration, micro CHP, microgrids, anaerobic digestion, and thermal cooling/chilling**; or**
- Be undertaking a feasibility analysis related to such an installation; **and**
- Have a regional economic development sponsor; **and**
- Be receiving funding through a federal, state, local or utility clean energy program or; **and**
- Involve redevelopment of a multiple-building complex that will create or retain a minimum of 250 jobs; **and**
- Be used for – or have a marketing plan to attract -- commercial, industrial or mixed use businesses. For mixed use facilities, the total square footage associated with retail, housing and community space must not exceed 25 percent of the total project square footage.

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

The maximum allowable grant award for the Customer Track is $250,000 and the maximum allowable grant award for the Community Track is $500,000. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award. If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Grant amounts will be determined based on the size of the **total** investment made in the project/facility (including energy and non-energy related investments) as follows:

| Total Investment | Total Avail Funding not to Exceed: |
|---|---|
| $50,000 to $250,000 | $25,000 |
| $250,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| Above $5 Million | $250,000 |
| Above $10 Million* | $500,000 |

*Community Track Only

- Program funds may only be used to offset twenty-five percent (25%) of project costs (3:1 funding match required).
- Grant program funds must not exceed applicant's equity or repayable debt contribution to the project
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Future of Gas and Economic Development Program please:

Complete the program application online; and
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at* Karen.Mousaw@nationalgrid.com.

nationalgrid

**CAPITAL INVESTMENT INCENTIVE**

**Program Summary**

The **Capital Investment Incentive Program** provides funds to help offset customer costs associated with upgrading natural gas infrastructure to accommodate a business expansion or new construction project. Applicants must demonstrate that they are unable to secure sufficient funding for the project through federal, state, or local economic development programs. Application requests may include, but are not limited to the following:

- Improvements to National Grid's natural gas system, such as line extensions or upgrades to existing gas delivery infrastructure, that require a customer contribution in aid of construction.
- Customer costs associated with conversion from oil or other fuels to National Grid natural gas delivery service.
- Customer costs associated with equipment required to establish or expand natural gas service, including but not limited to headers, pressure boosters, header pads or capital investment required to meet local building codes related to natural gas utilization.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below, prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:

- Be the customer of record (owner or lessee) of an eligible facility or prospective eligible facility;
- Demonstrate efforts to obtain state & local economic development incentives for the facility;
- Demonstrate the ability to attract and/or retain jobs and generate capital investment in the eligible facility; and,
- Make a capital investment (building, machinery and or equipment) that requires natural gas infrastructure improvements.

To be eligible for this program, the **facility (business) or prospective facility must:**

- Be located in National Grid's downstate New York service territory;
- Demonstrate Industrial Development Agency (IDA) or other public development agency support for the project;
- Be currently served under – or expected by National Grid to be served under – one of the following natural gas service classifications SC-2-1, SC-2-2, SC-4A-C&G, SC-5A, SC-6C, SC-17, SC-17-2-1, SC-17-2-2, SC-4A-C&G, SC-18-5A, or SC-18-6C **and**,
- Be used for business purposes that can be classified in one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution centers
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations
  - Regional/national administrative centers or headquarter facilities
  - Agri-Business and/or Aquaculture

- Projects that become eligible for Excelsior Jobs Program tax credits from New York State, regardless of their industry classification

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

Grant amounts are determined based on the **total** capital investment being made in infrastructure, plant & equipment (including energy and non-energy related investments) as follows:

| Total Capital Investment | Total Available Funding not to Exceed: |
|---|---|
| $100,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $250,000 |
| $5 Million and above | $500,000 |

Program funds cannot represent more than 30% of the total capital investment costs (energy infrastructure and other related capital improvements).

Program funds cannot exceed the final cost of energy related infrastructure Improvements related to the project.

Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.

Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Natural Gas Capital Investment Incentive Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**COOPERATIVE BUSINESS RECRUITMENT PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
Regional, county, and local economic development organizations have limited resources to devote to "marketing" their communities to attract business investment and jobs. This is true even of counties that possess extraordinary assets for business attraction – such as prime industrial sites or available buildings and infrastructure. While the cost of business attraction activities typically relies on local and regional resources, community expectations tend to be very high in terms of success in recruiting wealth-generating businesses.

The **Cooperative Business Recruitment Program** provides incremental matching funds for cooperative marketing initiatives between National Grid and regional or local economic development partners.

Application requests may include, but are not limited to, the following:
- The creation of collateral material and direct mail campaigns;
- Sales initiatives related to major business development events, such as Industrial Asset Management Forums, Area Development Consultants Forums, and other events where site location consultants and corporate real estate executives gather;
- Support research and assistance with site selection familiarization tours, industry trade shows, and sales missions;
- Sales initiatives directed at industry trade groups; and
- Support for the creation and distribution of industry-specific publications.
- Advertising and public relations activities.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:
- Be a regional or local economic development organization in the National Grid downstate service territory; **and**
- Provide economic development business attraction services to a community or region located within the National Grid downstate service territory.

To be eligible for this program, the **marketing project** must:
- Promote community attributes or resources that represent a major asset for business attraction;
- Be targeted to decision makers who can influence the attraction of new jobs and investment to the National Grid downstate New York service territory; **and**
- Be designed to attract new business, investment, and jobs to the downstate New York National Grid service territory, based on the following factors:

- The extent to which the project compliments (and not duplicates) other local, regional, and state business attraction efforts;
- The economic development potential of the asset that is being promoted;
- The project sponsor's ability to accomplish and sustain the effort of the project;
- The project sponsor's ability to leverage federal, state, and local matching funds; and
- The extent to research proposed does not duplicate previous research and is "actionable" (*e.g.* refining the targets, messages, materials and activities generated by the research proposed).

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application. Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- National Grid funds for cooperative projects must be matched on a 1:1 basis.
  - Maximum grant per project is $50,000.
  - Grant funds cannot be applied to past business attraction efforts.
  - Collateral materials must recognize National Grid's contribution.

**How to Apply**

To apply for the Cooperative Business Recruitment Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**NATURAL GAS MANUFACTURING PRODUCTIVITY PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
Manufacturing employs over 550,000 New Yorkers and contributes $61 billion annually to New York State's GDP. Every manufacturing job creates more than 2.5 related jobs in other sectors, and every dollar spent generates an additional $1.37 in economic activity.* Small and medium sized downstate New York manufacturers are challenged by high costs and regulatory pressures. They must continually improve productivity and performance to remain competitive in the global economy. In order to grow, they must develop new products and improve their return on investment from sales and marketing activities by finding new customers, markets, and export opportunities. This program has been developed in partnership with the Regional Technology Development Centers ("RTDC"s) in New York State, and will be delivered in conjunction with these RTDCs.

**Source: Manufacturers Association of Central New York*

The **Manufacturing Productivity Program** provides matching grants of up to $15,000 or 40% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to "lean manufacturing" projects or manufacturing assistance projects that result in eliminating waste and increasing productivity on the "shop floor" and in the office.

Further, the program provides matching grants of up to $15,000 or 50% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to growth-targeted activities that will result in greater utilization of manufacturing capacity.

Finally, the program provides matching grants of up to $40,000 or 60% (whichever is less) of the costs incurred by eligible applicants whose top management commits the time and resources to projects that combine and coordinate the productivity and growth activities described above.

Grant awards will be funded in conjunction with RTDCs upon verification of increased productivity and capacity, improvement of the bottom-line and pursuit of additional sales with the same work force. Priority consideration will be given to projects that involve energy efficiency, energy utilization, and/or environmental solutions.

Applications for matching grant assistance must meet the following program requirements.

**Minimum Program Requirements**

To be eligible for this program, the **applicant** must:

- Be an SC-2-1, SC-2-2, SC-5A, SC-6C, SC-17, SC-17-2-1, SC-17-2-2, SC-18-5A, or SC-18-6C customer in good standing within National Grid's downstate New York gas service territory;
- Be a business that is classified in the North American Industry Classification System (NAICS) as Manufacturing (NAICS codes 31, 32 or 33);
- Execute an agreement that commits top management to the processes that result in the productivity and development improvements articulated in this program distribution; **and**

- Provide evidence of funding from the company and other sources that is sufficient to complete the proposed project. The company must provide a minimum of 25% of the total funding from its own capital.

*NAICS classifications can be found online at* http://www.census.gov/epcd/www/naics.html

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the project must accomplish one or more of the following:

- Optimize the current facility
- Increase machine effectiveness
- Improve product quality
- Reduce costs
- Reduce lead times
- Improve process flow
- Increase inventory turns
- Expand markets
- Develop new customers
- Develop new products

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

**How to Apply**

To apply for the Manufacturing Productivity Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at* Karen.Mousaw@nationalgrid.com.

nationalgrid

**BROWNFIELD REDEVELOPMENT ASSISTANCE PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
Nearly every community in New York State is affected by brownfield sites and abandoned properties. Contaminated and abandoned properties exist in big cities, small towns, sprawling suburbs, and the country side. Left untouched, brownfields pose environmental, legal and financial burdens on a community and its taxpayers. However, after cleanup, these sites can again become the powerful engines for economic vitality, jobs and community pride that they once were.

The **Brownfield Redevelopment Assistance Program** provides grants to fund utility related infrastructure improvements, demolition, and other costs that are necessary to progress the redevelopment of a *brownfield* site or abandoned building. Application requests may include but are not limited to the following:

- Demolition that results in the clean-up and re-use of a contaminated site or building;
- Gas infrastructure improvements; and,
- Costs associated with the local match for NYS DEC Environmental Restoration Program (ERP) and the Brownfield Opportunity Area Program (BOA).
- Phase I and Phase II environmental site assessments

Priority will be given to site or building redevelopment projects that have obtained a sufficient amount of funding to fulfill the project redevelopment goals.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:
- A municipality and/or its authorized development corporation, **or**
- A 501(c)3, 501(c)6, or 501(c)4 corporation, working in tandem with a municipality and/or its Industrial Development Agency or Local Development Corporation, **or**
- Be the owner or developer of the eligible site with the endorsement of the municipality

To be eligible for this program, the **project (site or building)** must:
- Receive natural gas service from National Grid;
- Have a viable commercial or industrial end use strategy for the site, based on some or all of the following factors:
  - Physical condition of building or site
  - Potential for land acquisition or site control
  - Regional economic impact of successful reuse

- Demonstrated ability to accomplish and sustain reuse as a commercial or industrial site.
- Demonstrated ability to obtain federal, state and other funding
- Demonstrated ability to market the site or building to attract economic investment
- Eligibility for state and federal development funds for the total project costs
- Strength of development partnerships and community support

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- The maximum grant allowable for a project is $250,000
- Program funds may be used for up to 25% of the eligible costs of a project
- The maximum program funds that can be allocated to the completion of both Phase I and Phase II Environmental investigations and other preliminary site/building investigations is $25,000; this is included in the maximum allowable grant of $250,000.
- National Grid funds may be used as matching funds for other public grants. In this instance, National Grid will commit dollars contingent upon the successful awarding of the grant, but will not release funding until all required project funding is in place.

**How to Apply**
To apply for the Brownfield Redevelopment Assistance Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**INDUSTRIAL BUILDING REDEVELOPMENT PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
National Grid's downstate New York service territory has many vacant and underutilized buildings or complexes (integrated groups of buildings) that were originally built for and occupied by a single, large end-user. These buildings and complexes are unlikely to attract single end-users, so they must be marketed as multi-tenant, industrial properties. One of the challenges to the marketability of these properties is the expense of separating the utilities.

The **Industrial Building Redevelopment Program** provides grants of up to $250,000 (based on the amount of capital investment per the chart below) to property owners who are upgrading natural gas infrastructure to return these properties to active industrial use.

| Total Capital Investment | Available Funding Not to Exceed |
|---|---|
| Under $1Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| $5 Million and above | $250,000 |

**Minimum Program Requirements:** *Please review the program requirements and guidelines below, prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must:
- Be the owner, duly authorized representative of the owner or contract purchaser of the eligible facility;
- Demonstrate a willingness and ability to actively market the building to out-of-state companies;
- Obtain Industrial Development Agency (IDA) or other public development agency support for the project.

To be eligible for this program, the **project** must:
- Be a building or integrated group of buildings that were at one time occupied by a single user;
- Receive natural gas service from National Grid;
- Be vacant or underutilized (underutilized means that at least 50% of the usable space is vacant);
- Be at least **50,000** square feet or larger;
- At project conclusion, provide a certificate of occupancy or a certificate of compliance from the local building codes department; and,

- Be suitable for use by one of the following industry sectors:
  - Manufacturing
  - Regional warehousing/distribution center
  - Scientific research and development
  - Data Centers
  - "Back office" operations such as data processing or customer service operations

**Funding and Eligibility Guidelines**
Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

Grant amounts listed are the maximum allowable award for each program. Each application is evaluated on a variety of factors, resulting in some not receiving the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Program funds may only be used to offset 50% of costs associated with upgrading, segregating, or otherwise making the property's gas infrastructure suitable for occupancy by multiple tenants. This could include costs associated with planning, design, engineering, and construction costs
- Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.
- Priority will be given to applicants who furnish aggressive marketing plans designed to attract new businesses to the completed project.
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Industrial Building Redevelopment Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@national.com.*

nationalgrid

**CLEANTECH INCUBATION**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department, in advance of the project announcement.*

**Program Summary**
This program supports the development of a self-sustaining entrepreneurial and innovation "ecosystem" in downstate New York that will stimulate and support high growth new businesses generating new jobs and new investment in the National Grid service territory. National Grid has created this program to support initiatives that facilitate formation of new ventures or growth of high potential small ventures and also to make buildings more marketable for the creation of new jobs in the clean tech industry and other advanced technology industry sectors.

The **CleanTech Incubation Program** provides grants up to $250,000 to support entrepreneurial ventures, connect new companies to key resources, address their critical problems, and assist them in capitalizing on emerging opportunities. Application requests may include but are not limited to the costs associated with market research; commercialization efforts and consulting support that includes entrepreneurs-in-residence (EIR's); training; and costs related to performance tracking and documentation of lessons learned (for replication purposes).

Priority will be given to applicants who have undertaken similar projects elsewhere and concluded them successfully.

The **Program** also offers matching grants of up to $250,000 for the fit up of buildings that provide business incubation services for companies in the clean tech industry sector based on the following levels of capital investment as follows:

| Total Capital Investment | Available Funding Not to Exceed |
|---|---|
| Under $1Million | $50,000 |
| $1Million to $5Million | $100,000 |
| $5Million and above | $250,000 |

**Minimum Program Requirements:**
*Program assistance is only available to customers in good standing located within the National Grid downstate New York franchise territory. Applicants must be current in payments with National Grid, or have executed a deferred payment agreement, and be operating under a franchise agreement with the company.*

To be eligible for the entrepreneur venture support, the **applicant** must:
- Be a NYS Center for Advanced Technology (CAT), or Center of Excellence (COE), or a 501(c)3, 501(c)4 or 501(c)6 corporation dedicated to entrepreneur support.
- Have experience and a track record of successful performance in economic development and entrepreneurship, **and**
- Have a history of working and interacting with entrepreneurs and organizations that support entrepreneurs;

To be eligible for the entrepreneur venture support, the **Project** must:

- Have a physical location in National Grid's downstate NY service territory that receives electric and/or natural gas service **and**:
- Focus on business-related issues that facilitate the creation, sustainability and/or growth of for-profit entrepreneurial ventures **and;**
- Include hands-on implementation assistance involving direct interaction with entrepreneurs and their ventures **and;**
- Include metrics and a tracking method related to increases in entrepreneurial activity including ventures started or growth in existing ventures, jobs created and/or retained, new capital investment and/or revenue growth **and;**
- Be based on a replicable model with a final report that outlines lessons learned from the funded and substantiated financial results **and;**

To be eligible for the building fit-up assistance, the **applicant** must:

- Be the owner of the eligible site or building **or**
- Be a municipality or not-for-profit (501C3 or 501C6) economic development agency responsible for the development of the site or building.

To be eligible for building fit-up assistance the **Project** must:

- Have a physical location in National Grid's downstate NY service territory that receives natural gas service **and**;
- Have existing infrastructure that is a barrier to new investment. **and;**
- Include a plan for marketing the building to Clean Tech and other advanced technology industries

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended during that program year. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

- National Grid funds may only be used to offset 50% of project costs (minimum 1:1 funding match required).
- Funding will be limited to one application per organization per year.
- Entrepreneur funding is intended to provide one time support for new entrepreneur initiatives.
- A maximum of 10% of the total grant award can be given to any individual entrepreneur or company.
- Building fit-up funds can only be used to offset the costs for building drawings, design work, and/or construction

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds. Grant amounts listed are the maximum allowable award for each program. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

**How to Apply**

To apply for the CleanTech Incubation Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.

nationalgrid

**CINDERELLA PROGRAM**

*Note to state, regional, and local economic developers: If you intend to use this program as part of an overall incentive offer to a company, you must submit a written request to National Grid's Economic Development Department in advance of the project announcement.*

**Program Summary**
For more than forty years, National Grid's Cinderella economic and community development program has helped to revitalize local communities throughout Brooklyn, Queens, Staten Island and Long Island. The downstate New York service territory of National Grid includes vacant buildings, urban corridors, and commercial districts with unrealized development potential and often with excess utility infrastructure and capacity. This program is designed to assist communities in promoting "smart growth" through the redevelopment of those underutilized assets, to help improve their economic viability, attract new investment, and capitalize on their distinct development potential.

The **Cinderella Program** provides grants to municipal and non-profit development corporations to offset a portion of the costs of redeveloping and revitalizing critical commercial districts and urban corridors.

Application requests may include, but are not limited to, the following:

- Development of pre-construction documents that advance an existing community accepted design plan, site preparation, and construction of commercial and industrial adaptive re-use projects; and
- Renovation and rehabilitation of vacant commercial, industrial, and mixed-use buildings
- New construction on parcels where re-use is not possible/practical without demolition of the existing structure

Priority projects will be sustainable and demonstrate use of green building technologies/LEED certified initiatives (Leadership in Energy & Environmental Design) and Greening USA's 12 Traits of Sustainability. Preference will also be given to customers converting to innovative natural gas technologies. This program is not intended to provide funding related to government operations or services. Projects must be located in an underutilized central business district, commercial area or targeted redevelopment area. The building itself must be either 100% vacant or at least 90% vacant and identified as a critical redevelopment project. Projects must demonstrate job creation and the ability to stimulate ancillary public and private investment will be viewed favorably in the evaluation process. Applications showing commitments from public funding resources such as the Governor's Office of Small Cities and Empire State Development are encouraged.

**Minimum Program Requirements:** *Please review the following program requirements and guidelines carefully. They will help you decide whether you want to apply for this program.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's Downstate New York franchise territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:

- A municipality and/or its authorized development corporation; **or**
- A 501(c)(3), 501(c)(6), or 501(c)(4) corporation, with a letter of support from the municipality and/or its Industrial Development Agency or Local Development Corporation; or lead community development organization **or**
- Be the owner or developer of the eligible site with the endorsement of the municipality, or the lead community development organization

To be eligible for this program, the **project** must:

- Receive natural gas service from National Grid or demonstrate a commitment to convert to National Grid gas service;
- Be located in a central business district, commercial corridor or targeted building, or redevelopment neighborhood
- Show evidence of private sector job creation/retention and capital investment;
- Reside in a building in which the commercial space has been 100 percent vacant for a minimum of 1 year; ~~that is completely vacant OR within a targeted redevelopment area in which fifty percent (50%) of the commercial, and mixed use buildings are 100% vacant. The subject building must be at least 90% vacant;~~ **and**
- Upon project completion show evidence of certificate of occupancy

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter.

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline the expectations of the grant program and the conditions upon which funds will be released.

Grant amounts listed are the maximum allowable award for each program. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Funding for eligible mixed-use projects will be appropriately scaled based on the proportion of commercial versus residential square footage and/or construction costs.
- Grant amounts will be determined based on the size of the **total** capital investment made in the project/facility (including energy and non-energy related investments) as follows:

| Total Capital Investment | Total Avail Funding not to Exceed: |
|---|---|
| $50,000 to $250,000 | $25,000 |
| $250,000 to $1 Million | $50,000 |
| $1 Million to $5 Million | $100,000 |
| Above $5 Million | $250,000 |

- Program funds will not exceed fifty percent (50%) of eligible costs
- Projects demonstrating *Greening USA's* "12 Steps of Sustainability" or receiving some level of LEED certification will receive priority consideration and the possibility of additional funding.
- Preference will also be given to customers converting to innovative natural gas technologies.
- Project must show evidence that a comprehensive assessment of energy efficiency measures was fully investigated and provide documentation pertaining to any completed or pending applications for energy efficiency incentives.
- Priority consideration during the grant award process will be given to projects that commit to using self-generated or purchased renewable natural gas to satisfy some or all of their supply requirements.

**How to Apply**

To apply for the Cinderella Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com.*

nationalgrid

**SUSTAINABLE GAS AND ECONOMIC DEVELOPMENT PROGRAM**

**The Sustainable Gas and Economic Development Program** will fund a limited number of projects in the National Grid service territory that demonstrate sustainable gas technologies while producing significant economic development benefits for the region. The program will provide matching grants of up to $250,000 for collaborative projects that involve a downstate New York research institution, one or more sustainable gas or gas transportation technologies and a regional economic development sponsor. Eligible technologies include, but are not limited to, those that produce or utilize pipeline quality gas from biogas resulting from anaerobic digestion or gasification of waste materials for delivery in local distribution systems or use in natural gas vehicles.

**Minimum Program Requirements:** *Please review the program requirements and guidelines below prior to completing an application for funding.*

*Note: Program assistance is only available to customers in good standing, located within National Grid's downstate New York service territory. Applicants must be current in payments with National Grid or have executed a deferred payment agreement with the Company.*

To be eligible for this program, the **applicant** must be:

- A regional economic development entity in National Grid's downstate New York service territory; **or**
- A University-based research organization with the endorsement of the authorized municipality where the project is taking place; **or**
- A 501(c)(3), 501(c)(6), or 501(c)(4) corporation, working in tandem with a municipality, university, or regional economic development organization.

To be eligible for this program, the **project** must:

- Be located within the National Grid downstate NY service area;
- Involve development and deployment of sustainable gas or gas transportation technologies such as bio-methane or gas blends processed to pipeline quality standards produced from landfill gas recovery, municipal wastewater operations, municipal solid wastes, wood and pulp wastes, farm or dairy wastes, or any other renewable material that is both produced and processed in NY State for delivery in a local distribution system or use in natural gas vehicles;
- Obtain matching funds on at least a 4:1 basis from other sources;
- Include involvement of a regional university research institution;
- Have one or more sustainable gas or related sustainable gas technology partners;
- Have a regional economic development sponsor; **and**
- Show specific evidence of regional economic development benefits by**:**
    3. Creating an asset that will enhance regional business attraction or expansion efforts; **or**
    4. Serving as a learning center for sustainable gas or sustainable gas transportation technologies.

**Funding and Eligibility Guidelines**

Program funding and parameters are established annually by National Grid. Grants are available on a continual basis until all funding is expended or until the end of National Grid's current rate agreement. Funding is released to a grant award recipient only after the recipient has met all conditions of the

program. In all circumstances, funding should be viewed by the applicant as a reimbursement for work completed following grant approval in the form of an award letter

The grant award recipient should expect to execute a Funding Agreement with National Grid. The Agreement will outline expectations of the grant program and the conditions for the release of funds.

The maximum allowable grant award for this program is $250,000. All applications are evaluated on a variety of factors. Some applications may not result in the maximum grant award.

If you are applying to more than one program for the same project, you must indicate that clearly on the application.

Under no circumstance will funding be released after the expiration of the Company's current rate agreement or without prior written consent from National Grid.

- Program funds may only be used to offset twenty percent (20%) of project costs (4:1 funding match required)

**How to Apply**

To apply for the Sustainable Gas and Economic Development Program please:

Complete the program application online; and,
Upload all required documentation as noted at the end of your online application.

*If you need assistance in completing the application, please contact Karen Mousaw via email at Karen.Mousaw@nationalgrid.com*

**Testimony of the Future of Heat Panel**

**Exhibit ___ (FOH-8)**

**Cost Forecast of KEDNY and KEDLI's Proposed Economic Development Grant Programs**

KEDNY and KEDLI Economic Development Grant Programs - Projected Annual Spending and Proposed Levels of Funding

KEDNY

| | FY 2020 (1) | Rate Year (2) | Data Year 1 (3) | Data Year 2 (4) | Data Year 3 (5) |
|---|---|---|---|---|---|
| Starting Balance (6) | $3,932,096 | $4,732,096 | $2,982,096 | $1,482,096 | $482,096 |
| Proposed Annual Rate Allowance | $2,000,000 | $500,000 | $1,000,000 | $1,500,000 | $2,000,000 |
| Projected Grant Spending | $1,200,000 | $2,250,000 | $2,500,000 | $2,500,000 | $2,250,000 |
| Ending Balance | $4,732,096 | $2,982,096 | $1,482,096 | $482,096 | $232,096 |

KEDLI

| | | | | | |
|---|---|---|---|---|---|
| Starting Balance (6) | $3,870,000 | $5,170,000 | $2,920,000 | $1,420,000 | $420,000 |
| Proposed Annual Rate Allowance | $2,000,000 | $500,000 | $1,000,000 | $1,500,000 | $2,000,000 |
| Projected Grant Spending | $700,000 | $2,750,000 | $2,500,000 | $2,500,000 | $2,250,000 |
| Ending Balance | $5,170,000 | $2,920,000 | $1,420,000 | $420,000 | $170,000 |

Notes:
(1) FY 2020: Year ending March 31, 2020
(2) Rate Year: Year ending March 31, 2021
(3) Data Year 1: Year ending March 31,2022
(4) Data Year 2: Year ending March 31, 2023
(5) Data Year 3: Year ending March 31, 2024
(6) Starting balance for FY 2020 is a forecast of the grant program deferral balance (regulatory liability) as of April 1, 2019

Exhibit __ (FOH-8)
Page 1 of 1

**Testimony of the Future of Heat Panel**

**Exhibit____(FOH-9)**

**Example of the E-Commerce Platform Service Revenue Calculation**

**KEDNY EXAMPLE**

| | Rate Year One | Rate Year Two | Rate Year Three | Rate Year Four |
|---|---|---|---|---|
| 1. Actual Revenues | $ 200 | $ 400 | $ 600 | $ 800 |
| 2. Customer Share of Revenues | 80% | 80% | 80% | 80% |
| 3. Amount Deferred to Customers | $ 160 | $ 320 | $ 480 | $ 640 |

Notes (by line number)
1 Input - Actual Revenues
2 Customer Share - 80%
3 Line 1 multiplied by Line 2

Exhibit __ (FOH-9)
Schedule 1
Page 1 of 2

**KEDLI EXAMPLE**

| | Rate Year One | Rate Year Two | Rate Year Three | Rate Year Four |
|---|---|---|---|---|
| 1. Actual Revenues | $ 200 | $ 400 | $ 600 | $ 800 |
| 2. Customer Share of Revenues | 80% | 80% | 80% | 80% |
| 3. Amount Deferred to Customers | $ 160 | $ 320 | $ 480 | $ 640 |

Notes (by line number)
1 Input - Actual Revenues
2 Customer Share - 80%
3 Line 1 multiplied by Line 2

**Testimony of the Future of Heat Panel**

**Exhibit____(FOH-10)**

**Summary of the**
**Proposed Earnings Adjustment Mechanisms**

| KEDNY EAM | Achievement Targets | Annual Targets (Calendar Year) 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **System Efficiency** | | | | | |
| Peak Reduction (hourly mmBtu) | Minimum | 510 | 638 | 766 | 893 |
| | Mid-Point | 561 | 702 | 842 | 983 |
| | Maximum | 612 | 766 | 919 | 1,072 |
| System Diversification (mmBtu) | Minimum | 108,047 | 125,934 | 142,003 | 156,097 |
| | Mid-Point | 270,118 | 314,836 | 355,007 | 390,244 |
| | Maximum | 540,237 | 629,672 | 710,015 | 780,487 |
| **Energy Efficiency** | | | | | |
| Incremental Energy Efficiency (mmBtu) | Minimum | 755,266 | 482,466 | 546,466 | 676,466 |
| | Mid-Point | 1,009,930 | 618,953 | 688,542 | 815,165 |
| | Maximum | 1,264,594 | 755,439 | 830,617 | 953,864 |
| Affordability | N/A | | | | |
| | | | | | |
| | | | | | |
| **Carbon Reduction** | | | | | |
| Carbon Reduction - Full Service (mtCO2e) | Minimum | 1,647 | 3,432 | 3,632 | 3,893 |
| | Mid-Point | 2,471 | 5,149 | 5,447 | 5,839 |
| | Maximum | 3,295 | 6,865 | 7,263 | 7,785 |
| Carbon Reduction - Transportation (mtCO2e) | Minimum | 2,891 | 5,840 | 5,899 | 5,958 |
| | Mid-Point | 4,337 | 8,760 | 8,848 | 8,936 |
| | Maximum | 5,782 | 11,680 | 11,797 | 11,915 |

Exhibit __ (FOH-10)
Schedule 1
Page 1 of 4

| KEDLI EAM | Achievement Targets | Annual Targets (Calendar Year) 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **System Efficiency** | | | | | |
| Peak Reduction (hourly mmBtu) | Minimum | 232.00 | 290 | 348 | 406 |
| | Mid-Point | 255.20 | 319 | 383 | 447 |
| | Maximum | 278.40 | 348 | 418 | 487 |
| System Diversification (mmBtu) | Minimum | 71,605.95 | 83,856 | 93,617 | 101,619 |
| | Mid-Point | 179,014.87 | 209,640 | 234,042 | 254,048 |
| | Maximum | 358,029.73 | 419,280 | 468,083 | 508,096 |
| **Energy Efficiency** | | | | | |
| Incremental Energy Efficiency (mmBtu) | Minimum | 419,023 | 252,139 | 285,139 | 327,139 |
| | Mid-Point | 544,169 | 314,842 | 347,943 | 380,603 |
| | Maximum | 669,315 | 377,545 | 410,747 | 434,068 |
| Affordability | N/A | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Carbon Reduction - Full Service (mtCO2e) | Minimum | 1,792 | 4,301 | 5,563 | 7,369 |
| | Mid-Point | 2,688 | 6,452 | 8,344 | 11,053 |
| | Maximum | 3,584 | 8,603 | 11,126 | 14,737 |
| Carbon Reduction - Transportation (mtCO2e) | Minimum | 2,891 | 5,840 | 5,899 | 5,958 |
| | Mid-Point | 4,337 | 8,760 | 8,848 | 8,936 |
| | Maximum | 5,782 | 11,680 | 11,797 | 11,915 |

| KEDNY EAM | Achievement Targets | Annual Basis Point Allocations (Calendar Year) 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **System Efficiency** | | **25** | **25** | **25** | **25** |
| Peak Reduction | Minimum | 1 | 1 | 1 | 1 |
| | Mid-Point | 3 | 3 | 3 | 3 |
| | Maximum | 5 | 5 | 5 | 5 |
| System Diversification (mmBtu) | Minimum | 4 | 4 | 4 | 4 |
| | Mid-Point | 10 | 10 | 10 | 10 |
| | Maximum | 20 | 20 | 20 | 20 |
| **Energy Efficiency** | | **50** | **30** | **30** | **30** |
| Incremental Energy Efficiency | Minimum | 0 | 0 | 0 | 0 |
| | Mid-Point | 20 | 10 | 10 | 10 |
| | Maximum | 40 | 20 | 20 | 20 |
| Affordability | Minimum | | | | |
| | Mid-Point | | | | |
| | Maximum | 10 | 10 | 10 | 10 |
| **Carbon Reduction** | | **3** | **8** | **8** | **8** |
| Carbon Reduction - Full Service | Minimum | 1 | 1 | 2 | 2 |
| | Mid-Point | 1 | 2 | 2 | 3 |
| | Maximum | 1 | 3 | 3 | 3 |
| Carbon Reduction - Transportation | Minimum | 1 | 3 | 3 | 3 |
| | Mid-Point | 2 | 4 | 4 | 4 |
| | Maximum | 2 | 5 | 5 | 5 |
| **Total Basis Points** | **Minimum** | **2** | **2** | **3** | **3** |
| | **Mid-Point** | **36** | **29** | **29** | **30** |
| | **Maximum** | **78** | **63** | **63** | **63** |

| KEDLI EAM | Achievement Targets | Annual Basis Point Allocations (Calendar Year) 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **System Efficiency** | | **23** | **23** | **23** | **23** |
| Peak Reduction | Minimum | 1 | 1 | 1 | 1 |
| | Mid-Point | 2 | 2 | 2 | 2 |
| | Maximum | 3 | 3 | 3 | 3 |
| System Diversification | Minimum | 4 | 4 | 4 | 4 |
| | Mid-Point | 10 | 10 | 10 | 10 |
| | Maximum | 20 | 20 | 20 | 20 |
| **Energy Efficiency** | | **50** | **30** | **30** | **30** |
| Incremental Energy Efficiency | Minimum | 0 | 0 | 0 | 0 |
| | Mid-Point | 20 | 10 | 10 | 10 |
| | Maximum | 40 | 20 | 20 | 20 |
| Affordability | Minimum | | | | |
| | Mid-Point | | | | |
| | Maximum | 10 | 10 | 10 | 10 |
| **Carbon Reduction** | | **4** | **9** | **10** | **11** |
| Carbon Reduction - Full Service | Minimum | 1 | 2 | 2 | 3 |
| | Mid-Point | 1 | 3 | 4 | 5 |
| | Maximum | 2 | 4 | 5 | 6 |
| Carbon Reduction - Transportation | Minimum | 1 | 3 | 3 | 3 |
| | Mid-Point | 2 | 4 | 4 | 4 |
| | Maximum | 2 | 5 | 5 | 5 |
| **Total Basis Points** | **Minimum** | **7** | **10** | **10** | **11** |
| | **Mid-Point** | **35** | **29** | **30** | **31** |
| | **Maximum** | **77** | **62** | **63** | **64** |

**Testimony of the Future of Heat Panel**

**Exhibit____(FOH-11)**

**Non-Pipeline Alternatives Incentive Mechanism**

# THE BROOKLYN UNION GAS COMPANY d/b/a NATIONAL GRID NY

# AND KEYSPAN GAS EAST CORPORATION d/b/a NATIONAL GRID

# NON-PIPELINE ALTERNATIVES INCENTIVES MECHANISM PROPOSAL

April 2019

nationalgrid

# Table of Contents

# 1.0 Background and Overview

This document outlines the structure for The Brooklyn Union Gas Company d/b/a National Grid NY's ("KEDNY") and KeySpan Gas East Corporation d/b/a National Grid's ("KEDLI") (collectively, the "Companies") proposed non-pipeline alternatives ("NPAs") incentive mechanism. This proposal is the same as the December 2018 NPA incentive mechanism filed by the Companies' affiliate Niagara Mohawk Power Corporation d/b/a National Grid pursuant to Section IV.13.8.6 of the Joint Proposal adopted by the Public Service Commission (the "Commission") in Case 17-G-0239.

The Companies are experiencing increasing demand for natural gas service including increased customer demand to switch to natural gas from fuel oil and other, more-polluting fossil fuels. Because demand is expected to continue to increase, the Companies regularly assess economic, operationally sustainable, and more environmentally beneficial ways to meet future customer demand for natural gas service. The proposed NPA incentive mechanism is intended to promote a better balance between the Companies' need to maintain traditional supply and infrastructure to serve both existing and future load, and the societal benefits of adopting more modern, cost-effective alternatives to traditional gas supply and gas transmission/distribution system solutions.

Where possible, the proposed NPA incentive mechanism is similar to National Grid's existing electric non-wires alternative ("NWA") incentive mechanism. Like the NWA Incentive mechanism, the NPA incentive mechanism is designed to allow the Companies to retain a share of the present value of net benefits identified by comparing an NPA proposal, which may be in the form of a portfolio of NPA projects, to the traditional investment or project(s) it would defer or replace based on a benefit cost analysis ("BCA"). The BCA Handbook used to evaluate NPAs will be developed separately.

Given that the BCA Handbook used to evaluate NPAs has not yet been developed, the intention of this document is to establish the fundamental principles of the NPA incentive mechanism. This shall include, but not be limited to, the following:

1) Identifying the selection and screening criteria for determining if an NPA Proposal is eligible for earning an incentive under the NPA framework; and
2) Establishing the NPA incentive mechanism structure, calculation methodology, and filing, reporting, and repayment/recovery requirements.

# 2.0 NPA Proposal Requirements

## 2.1 NPA Proposals

For purposes of the NPA incentive mechanism structure, an "NPA Proposal" is a portfolio of projects, or an individual project, innovatively using proven technology to reliably delay, reduce, or eliminate the need for traditional capital investments or projects to reinforce or expand traditional gas supply or transportation/distribution infrastructure (*i.e.* that reduces net utility plant in service).[1] This can be

[1] While the development of this incentive mechanism is limited to address NPA solutions that reduce net plant in service; the Companies are not precluded from future development or consideration of alternative forms of incentives to address NPA solutions that produce net societal benefits but that do not directly reduce net plant. The Companies are encouraged to continue exploring new and innovative technologies and proposals for more integration of such into the Companies' long-term planning.

accomplished through demand-side solutions (*e.g.*, energy efficiency, demand response), supply-side solutions (*e.g.*, renewable natural gas ("RNG"), liquified natural gas ("LNG"), or compressed natural gas ("CNG")), solutions that use efficient electric applications as a substitute for or to convert from natural gas applications (*e.g.*, heat pumps or other technologies), or a combination thereof. Demand-side solutions can be designed to alleviate either peak period demands or daily demands, depending on the needs of the system.

NPA Proposals must be designed and deployed in a manner that does not adversely affect the reliability or safety of the gas or electric distribution systems or impede National Grid's ability to serve its natural gas customers.

For most NPA Proposals, the Companies will perform a market solicitation in the form of a Request for Information ("RFI"), Request for Proposals ("RFP"), a resource acquisition auction, or other market-based NPA solution acquisition strategy. The Companies may collaborate with the New York State Energy Research and Development Authority ("NYSERDA") to coordinate efforts. NPA Proposals that consist of a portfolio of projects must, in significant portion, rely on market-supplied NPA solutions in order to be eligible for the NPA Incentive. NPA Proposals using solutions or technologies that the Companies can deploy without a market solicitation (*e.g.*, energy efficiency or demand response programs) may be eligible for an NPA incentive following consultation with Department of Public Service Staff.

## 2.2 BCA

A BCA Handbook used to evaluate NPAs will be developed separately, possibly through a Commission-led statewide policy proceeding. This NPA Incentive structure references the BCA with the intent that only NPA Proposals with positive BCAs (>1)[2] will be eligible for incentives.

## 2.3 NPA Screening Criteria

The purpose of NPA screening criteria is to establish a minimum standard for NPA Proposals for which the Companies may investigate the use of an NPA incentive. The Companies may optionally pursue NPA Proposals that do not meet these criteria, provided that such NPA Proposals are cost-effective.

- Small NPA Proposals: estimated project costs for traditional infrastructure investment are greater than $1 million but less than $3 million and are designed to be completed in one fiscal year (design to project in-service)
- Large NPA Proposals: estimated project costs for traditional infrastructure investment are greater than $3 million and are designed to be completed in greater than one fiscal year (design to project in service)

These criteria can be adjusted through a filing with the Commission, which can be initiated by either the Companies or the Commission.

## 2.4 NPA Proposal Selection Criteria

Any NPA Proposal that is being submitted for an incentive must meet the following criteria:

[2] The BCA for the NPA Proposal will be an aggregate of all the projects that it represents.

### 2.4.1 Proven Technology

The technology for a given proposal must be installed and operational as demonstrated by proof of commercial use:

- if for less than three years, the Companies must provide basis for claiming the technology is reliable;
- technology must have been utilized at a scale no smaller than 1% of the proposed use (*i.e.*, if the installed project for this technology represents 5 DTh/hr, the largest proposal that can be included in an NPA filing is 500 DTh/hr);
- an iterative update of a technology (*e.g.*, a new version of a demand control device that has been installed and operated successfully), shall be considered acceptable provided that the underlying principles of the technology have not changed.

This incentive mechanism is not intended to discourage or limit the Companies' deployment, testing, or pilot programs for developing or experimental NPA technologies, but reserves eligibility for this financial incentive to proposals using existing or new NPA technologies that are commercially available and operationally sound.

### 2.4.2 Address Specific System Need

NPA Proposals must be structured to address specific needs on the system, as demonstrated by either a Synergi system model, by other system modeling, forecasting, or planning methods typically used by the Companies, or by observed system conditions on a near-peak or peak day ("Needs Assessment"). NPA Proposals and implementation plans should reference the system need and demonstrate how the combined capacity will meet or exceed the requirements.

### 2.4.3 Reliably Delays or Replaces Traditional Infrastructure

NPA Proposals must result in the delay or replacement of traditional reliability improvements or expansion of gas distribution or transmission capital investment or infrastructure project(s) that would otherwise be required to serve existing load or forecasted future demand. Any portfolio or individual project shall be capable of normal operation at daily average temperatures equivalent to the design conditions of the gas system, which is currently negative 10°F (75 Heating Degree Days ("HDD")). The Companies may pursue multiple NPA Proposals to defer separate traditional infrastructure projects in the same area.

### 2.4.4 Coincidence of Proposal

If the NPA Proposal includes more than one NPA project to address the system need, the application must indicate the following:

- Schedule for when the various NPA projects will come online (used and useful);
- Any time sensitivity impacting the various projects (*i.e.*, known situations in which the impact of a particular project or projects is likely to change due to timing variability); and
- The coincidence of the various projects, their aggregate impact, and the identified period of constraint.

As an illustrative example, if an RNG project would produce gas all day but a demand response project would only reduce usage during a peak period, the total impact would be:

- Daily reduction: 27 DTh (24 DTh from RNG, 6 DTh from DR)
- Peak hour reduction: 3 (1 DTh from RNG, 2 DTh from DR)

# 3.0 NPA Incentive Mechanism Framework

## 3.1 Incentive Mechanism Structure

The Companies may retain a share of the present value of net benefits identified by comparing an NPA Proposal to the traditional capital investment or infrastructure project it would defer or replace based on a BCA. The incentive amount available to the Companies is a share of the difference between the NPA Proposal costs and the costs of the traditional investment, inclusive of the value of avoided carbon, adjusted based on the difference between the forecast cost of achieving deferral and the actual costs.

## 3.2 Incentive Amount

The NPA Incentive will be calculated as 30 percent of Initial Net Benefits, plus a 50 percent share of cost overruns/underspend for large NPA Proposals, or plus an additional amount based on unit difference in NPA Proposal costs for small NPA Proposals, with an incentive floor of $0 and a cap of 50 percent of the initially identified net benefits. In the event the number of dekatherms per hour (DThs/hr) required to defer the traditional project increases or decreases, or if actual conditions of the project differ significantly from the forecast, the incentive amount would be further adjusted.

Initial Net Benefits is the present value of the net benefits projected at the time the Companies has either entered into contracts for the entire NPA Proposal, or when there is reasonable certainty on the price of the NPA Proposal. Initial Incentive shall be defined as the eligible percentage multiplied by the Initial Net Benefits.

$$Initial\ Incentive = eligible\ percentage * Initial\ Net\ Benefits$$

NPA Proposal Costs will be deferred with carrying charges.[3] Recovery of such costs will be amortized over a 10-year period, with offsetting credits to the extent that an NPA Proposal defers the need for a traditional infrastructure project included in the Companies' Average Gas Plant in Service Balance.

## 3.3 Small NPA Proposals

### 3.3.1 BCA

For Small NPA Proposals, the Companies will use a streamlined BCA, which will include the major categories of costs and benefits outlined in the BCA that is developed for NPAs, but will not include benefits which might otherwise be realized by implementing a traditional infrastructure solution. Utilization of a streamlined BCA is intended to allow small projects to proceed more quickly and efficiently through incentive evaluation, filing, and approval.

[3] Carrying charges, as referenced throughout this document, shall be at the pre-tax weighted average cost of capital.

### 3.3.2 Initial Unit Incentive and Incentive Calculation

For Small NPA Proposals, the initial incentive will be set on a per DTh/hr basis. This Initial Unit Incentive is calculated by dividing the 30% percent share of Initial Net Benefits for the NPA Proposal, by the number of DTh/hr to be procured for the NPA Proposal.

$$Initial\ Unit\ Incentive = \frac{Initial\ Incentive}{Initial\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA}$$

To establish the Initial Unit Incentive, the Companies shall make a compliance filing in the 2019 rate case docket. Prior to making its compliance filing to set the Initial Unit Incentive, the Companies shall seek input from Department of Public Service Staff. Once the NPA Proposal has been fully implemented, the Companies will calculate the Unit Difference in NPA Proposal Cost, equal to the initially-forecast cost of the NPA Proposal minus the actual cost of the NPA Proposal, divided by the number of DTh/hr required.

$$Unit\ Difference = \frac{(forecast\ NPA\ cost - actual\ NPA\ cost)}{Initial\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA}$$

The Final Incentive will be determined by adding the Unit Difference in NPA Proposal Cost to the Initial Unit Incentive, multiplied by the DTh/hr required.

$$Final\ Incentive = (Unit\ Difference + Initial\ Unit\ Incentive) * Initial\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA$$

The Final Incentive is subject to a floor of $0 and a cap of 50 percent of the Initial Net Benefits.

### 3.3.3 Scope Evaluation and Modification

The Companies will consider its need for more or fewer DTh/hr using an annual analysis. Should the Needs Assessment determine that additional DTh/hr be needed to achieve the initially proposed deferral of a traditional infrastructure project, or to increase the duration of the deferral, the Companies will make a compliance filing in the 2019 rate case docket and seek incremental DTh/hr procurements accordingly. So long as it is feasible and remains cost-beneficial to procure the additional DTh/hr to continue deferral, the Companies will be authorized to receive cost recovery of the expenditures incurred in obtaining the additional DTh/hr, including carrying charges. However, the Companies' Final Incentive would not reflect either the costs[4] or the benefits associated with the additional DTh/hr. In the event the Companies determines that acquiring additional DTh/hr is technically or operationally infeasible, it will plan to implement a traditional infrastructure solution. Recovery of any incentives related to that NPA Proposal will be halted without requiring a refund of the amounts already collected at that time.

If the Needs Assessment determines that fewer DTh/hr are required to achieve the intended deferral of traditional infrastructure, the Companies will only seek to decrease its procurements if it determines

[4] The expenditures related to acquiring such additional DTh/hr will not be considered in the Difference in NPA Proposal Cost used to calculate the Final Incentive.

that it needs only 70 percent or fewer of the initially-forecast DTh/hr to achieve the intended deferral. In the event of a reduction in the number of DTh/hr required, the Unit Difference in DTh/hr NPA Proposal Cost will be calculated, as if the DTh/hr reduction did not occur. The Final Incentive, however, will be calculated as the sum of the Initial Unit Incentive and the Unit Difference in NPA Proposal Cost, multiplied by the reduced amount of DTh/hr determined to be necessary, subject to the same 50 percent share of Initial Net Benefits incentive cap and $0 incentive floor provisions.

$$Final\ Incentive = (Initial\ Unit\ Incentive + \ Unit\ Difference) * Modified\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA$$

## 3.4 Large NPA Proposals

### 3.4.1 Incentive Filing

Large NPA Proposals will be subject to the full BCA process, including all ancillary, non-energy benefits. To establish the Initial Incentive, the Companies shall make a compliance filing in the 2019 rate case docket. Prior to making its compliance filing to set the Initial Incentive, the Companies shall seek input from Department of Public Service Staff. Once the NPA Proposal has been fully implemented, the Companies will calculate the Difference in NPA Proposal Cost, which will be equal to the initially-forecast cost of the NPA Proposal, less the actual cost of the NPA Proposal.

$$NPA\ Cost\ Difference = \ forecast\ NPA\ cost - actual\ NPA\ cost$$

The Final Incentive will equal the sum of the Initial Incentive and 50 percent of Difference in NPA Proposal Cost.

$$Final\ Incentive = Initial\ Incentive + 0.5 * (NPA\ Cost\ Difference)$$

The Final Incentive is subject to a floor of $0 and a cap of 50 percent of the Initial Net Benefits.

### 3.4.2 Scope Evaluation and Modification

Should the Needs Assessment show that additional DTh/hr be needed to achieve the initially proposed deferral of a traditional infrastructure project, or to increase the duration of the deferral, the Companies will make a compliance filing in the 2019 rate case docket and seek incremental DTh/hr procurements accordingly. So long as it is feasible and remains cost-beneficial to procure the additional DTh/hr to continue deferral, the Companies will be authorized to receive cost recovery of the expenditures incurred in obtaining the additional DTh/hr, including carrying charges. However, the Companies' Final Incentive would not reflect either the costs[5] or the benefits associated with the additional DTh/hr. In the event the Companies determines that acquiring additional DTh/hr is technically or operationally infeasible, it will plan to implement a traditional infrastructure solution. Recovery of any incentives related to that NPA Proposal will be halted without requiring a refund of the amounts already collected at that time.

[5] The expenditures related to acquiring such additional DTh/hr will not be considered in the Difference in NPA Proposal Cost used to calculate the Final Incentive.

In the event the Needs Assessment shows that fewer DTh/hr are needed to achieve the intended deferral of traditional infrastructure, the Companies will only reduce the number of DTh/hr it plans to procure if both the need for reduced DTh/hr is shown to be a sustained downward trend over a three-year period, and the Companies needs only 70 percent or fewer of the initially-forecast DTh/hr to achieve the intended deferral. The Companies will true-up the incentive by converting the Initial Incentive to an Initial Unit Incentive by dividing the Initial Incentive by the initial number of DTh/hr it forecasted.

$$Initial\ Unit\ Incentive = \frac{Initial\ Incentive}{Initial\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA}$$

Similarly, the Difference in NPA Proposal Cost to achieve deferral will be calculated on a per-DTh/hr basis, calculated as the Unit Difference in NPA Proposal Cost, equal to the initially-forecast cost of the NPA Proposal minus the actual cost of the NPA Proposal, divided by the number of DTh/hr required.

$$Unit\ Difference\ = \frac{forecast\ NPA\ cost - actual\ NPA\ Project\ Cost}{Initial\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA}$$

The Final Incentive will be calculated as the sum of the Initial Unit Incentive plus or minus the Unit Difference in NPA Proposal Cost, multiplied by the reduced amount of DTh/hr determined to be necessary, subject to the same 50 percent share of Initial Net Benefits incentive cap and $0 incentive floor provisions.

$$Final\ Incentive = (Initial\ Unit\ Incentive + \ Unit\ Difference) * Modified\ \#\ of\ \frac{DTh}{hr}\ for\ the\ NPA$$

## 3.5 NPA Proposal Cost and Incentive Recovery

The Companies' Capital Investment Reconciliation Mechanism is revised to remove the financial disincentive utilities face when engaging in NPA Proposals. To the extent an NPA Proposal results in the Companies displacing a capital project that is reflected in the Average Gas Plant in Service Balances, the balance(s) will be reduced to exclude the forecasted net plant associated with the displaced project. The carrying charge associated with the displaced project will be applied as a credit against the recovery of the associated NPA Proposal cost to be recovered from customers. In the event the carrying charge on the net plant of any displaced project is higher than the recovery of the associated NPA Proposal costs, the difference will be deferred for the benefit of customers.

NPA Proposal cost, reduced by carrying charges associated with the displaced traditional project, and incentive recoveries will be trued up to final NPA Proposal costs and the final incentive.

For example, if the Companies' Initial Incentive was $100,000 and the Final Incentive is $166,667 the Companies will true up to recover the $166,667 Final Incentive.

NPA Proposal costs and any incentive recovered, subject to true-up, under the NPA Incentive Mechanism will be allocated to each Service Class ("SC") based on the type of traditional gas project the

NPA would defer, using the following allocators: (1) Peak Sendout for projects that defer the need for infrastructure designed to meet the peak day demand; and (2) Total Gas Deliveries for projects that defer the need for infrastructure designed to meet daily demands. For example, the costs and incentives related to an NPA Proposal which defers the need for infrastructure designed to meet peak day demand would be allocated to SCs based on their Peak Sendout allocator. Similarly, the costs and incentives related to an NPA Proposal which defers the need for infrastructure designed to meet daily demand would be allocated to SCs based on their total Gas Deliveries allocator. In the event that an NPA Proposal is designed to benefit only certain classes of customers, the cost allocation will be limited to the benefitted classes.

Once allocated to each SC, these costs would be set forth on a gas rate statement, which will be filed with the Commission and posted to the Companies' website, that indicates the NPA surcharge rate to be included in the Delivery Service Adjustment ("DSA"), and to roll the NPA surcharge into the DSA line item on customers' bills, on a per therm basis.

The Companies will reconcile (true up) any over or under recoveries on an annual basis for the following:

- Forecast NPA Proposal cost to final NPA Proposal cost
- Initial Incentive to Final Incentive
- Over or under recoveries due to sales volume variances

## 3.6 Amortization of NPA Proposal Costs and Incentives

The Companies will recover its NPA Proposal costs over a 10-year period. The 10-year recovery period will begin when the NPA Proposal, or parts of the Proposal in the event of a portfolio, is/are being implemented and costs are realized. Any unamortized costs plus carrying charges, will be incorporated into base rates when gas base rates are reset.

For Large NPA Proposals, the Companies will be awarded and begin collecting the Final Incentive from customers once 70 percent of the DTh/hr it procured for the NPA Proposal have become operational (used and useful – as a percentage of a single project or a portfolio of projects) and have been verified through the Companies' measurement and verification procedures.

For Small Proposals requiring more than one DTH/hr, the Companies will be awarded and begin collecting an amount equal to the Initial Unit Incentive as each DTH/hr of the NPA portfolio becomes operational (used and useful as a percentage of a single project or a portfolio of projects). For Small Proposals less than one DTh/hr, the Companies will be awarded and begin collecting the Final Incentive once the entire NPA portfolio is operational.

For both Large and Small NPA Proposals, once awarded, the Companies will amortize the Final Incentive of an NPA proposal over the remaining deferral period for the traditional infrastructure project, inclusive of carrying charges on the unamortized balance of the Final Incentive.

### 3.7 Reporting Requirements

The Companies will file with the Commission Secretary a detailed implementation plan and BCA for each NPA Proposal once there is reasonable certainty as to the costs of the NPA Proposal. The implementation plan for each NPA Proposal will include, at a minimum: (1) detailed measurement and verification procedures specific to the operational, technological, and financial components of the NPA Proposal;[6] (2) the portfolio of component load reductions to be implemented; (3) the anticipated costs of the NPA Proposal; (4) a demonstration of whether the costs of the NPA Proposal are incremental to the Companies' revenue requirement or will be displacing a project subject to the Capital Investment Reconciliation Mechanism; (5) a customer and community outreach plan; and (6) the BCA results when available. If the number of DTh/hr or length of deferral is modified, the Companies shall also submit an updated BCA, as appropriate. The implementation plan for the NPA Proposal will be updated at least annually; however, the Companies will also update relevant plans promptly, if it determines it needs to increase or decrease the number of DTh/hr required to effectuate an NPA Proposal, or if the length of the deferral period for the traditional infrastructure solution associated with the NPA Proposal is modified. The Companies will also file updates to the implementation plan report when the Initial Incentive is set and upon determination of the Final Incentive. The Companies will work with Staff prior to filing the implementation plan and all updates thereto to ensure the accuracy of the filings.

Beginning in the year following the Companies' submission of its first NPA Proposal implementation plan, a summary of NPA Proposal implementation plans will be filed with the Commission Secretary annually by January 31 of each year. In addition, the Companies also will file with the Secretary quarterly reports 60-days after the close of each calendar year quarter showing: (1) NPA Proposal expenditures and all relevant details with respect to NPA Proposal costs; (2) a description of the NPA Proposal activities; (3) anticipated NPA Proposal in-service dates; (4) NPA Proposal cost and incentive recoveries; and (5) identification of operational savings or other benefits, including the value of avoided carbon.

All NPA Proposal reports shall be filed in the 2019 rate case docket, or in any subsequent rate case proceeding in which a Commission Order setting a new rate plan is filed.

## 4.0 Benefit Cost Analysis ("BCA") Principles

As mentioned above, the BCA Handbook that will be utilized with the NPA Incentive Mechanism will be developed separately. However, the Companies proposes that a BCA should:

- Be based on clear methodologies;
- Strive to identify and evaluate all benefits and costs, but recognize the need to use broader assumptions at times (e.g., when more granular details are not readily available or reasonably quantifiable);
- Evaluate projects and programs within the broader context of a portfolio (rather than as individual measures or investments), allowing for consideration of potential synergies and economies across the portfolio;

[6] Measurement and verification procedures will vary depending on the types of NPA solutions or technologies included in an NPA Proposal.

- Address the full lifetime of an investment's or program's impact; and
- Provide an assessment of the underlying risk of performance of an investment or program via sensitivity analysis on key assumptions.

# Testimony of the Future of Heat Panel

## Exhibit____(FOH-12)

### EmPower Replacement Earnings Incentive Mechanism

## KEDLI EmPower Replacement Program (HEAT) Incentive Mechanism Example

| | Number of Households Served | Approx. Cost per Household | Est. Aggregate Cost per Tier |
|---|---|---|---|
| | (a) | (b) | (c) |
| **Tier Two** | 2,250 | $ 200 | $ 450,000 |
| **Tier Three** | 750 | $ 1,000 | $ 750,000 |
| **Tier Four** | 185 | $ 5,000 | $ 925,000 |
| | | **Expenditures** | **$ 2,125,000** |
| | | **Budget (program costs only)** | **$ 2,125,000** |

| Incentive % for Tier | Earnings Incentive Per Household Served (Incentive % * Annual Budget) | Total Earnings Incentive for Each Tier (Earnings Incentive per Household Served * Number of Households Served) |
|---|---|---|
| (d) | (e) | (f) |
| | $ - | $ - |
| 0.0070% | $ 148.75 | $ 111,563 |
| 0.014% | $ 297.50 | $ 55,038 |
| | **Total Rate Year 1 Incentive** | $ 166,600 |

(a) Estimate of actual households
(b) Estimate of cost per household
(c) Column (a) times Column (b)
(d) Settled ratios in Case 16-G-0058
(e) Column (c) Budget line times Column (d)
(f) Column (a) times Column (e)

**Testimony of the Future of Heat Panel**

**Exhibit____(FOH-13)**

**Summary of Labor and Non-Labor**
**O&M Expenses for the Future of Heat initiatives**

The Brooklyn Union Gas Company d/b/a National Grid NY
Future of Heat Incremental Operating Expense
Other Initiatives
($000's)

Exhibit ___ (FOH-14)
Schedule 1

| Future of Heat Expense Initiatives | | Expense Rate Year 2021 | Expense Data Year 2022 | Expense Data Year 2023 | Expense Data Year 2024 | FTE Count Rate Year 2021 | FTE Count Data Year 2022 | FTE Count Data Year 2023 | FTE Count Data Year 2024 |
|---|---|---|---|---|---|---|---|---|---|
| Green Gas Tariff | Labor & OH's | $ - | $ 157.2 | $ 161.6 | $ 164.2 | - | 1.0 | 1.0 | 1.0 |
| | Non-labor | $ - | $ - | $ - | $ - | | | | |
| | Total | $ - | $ 157.2 | $ 161.6 | $ 164.2 | | | | |
| UESC Program | Labor & OH's | $ 119.8 | $ 122.4 | $ 125.9 | $ 127.9 | 1.0 | 1.0 | 1.0 | 1.0 |
| | Non-labor | $ 137.5 | $ 332.5 | $ 470.0 | $ 560.0 | | | | |
| | Total | $ 257.3 | $ 454.9 | $ 595.9 | $ 687.9 | | | | |
| Fuel-Switching Calculator | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 125.0 | $ 18.0 | $ 18.0 | $ 18.0 | | | | |
| | Total | $ 125.0 | $ 18.0 | $ 18.0 | $ 18.0 | | | | |
| Demand Response Demonstration Project | Labor & OH's | $ 104.1 | $ 106.4 | $ 218.8 | $ 222.3 | 0.7 | 0.7 | 1.4 | 1.4 |
| | Non-labor | $ 1,216.3 | $ 1,531.1 | $ 1,742.8 | $ 2,103.6 | | | | |
| | Total | $ 1,320.4 | $ 1,637.5 | $ 1,961.6 | $ 2,325.9 | | | | |
| Expanded Geothermal Demonstration Project | Labor & OH's | $ 98.8 | $ 101.0 | $ 103.8 | $ 105.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| | Non-labor | $ 117.0 | $ 225.0 | $ 396.0 | $ 528.0 | | | | |
| | Total | $ 215.8 | $ 326.0 | $ 499.8 | $ 633.5 | | | | |
| Low-to-Moderate Income Gas Conversion [1] | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 1,600.0 | $ 1,600.0 | $ 1,600.0 | $ 1,600.0 | | | | |
| | Total | $ 1,600.0 | $ 1,600.0 | $ 1,600.0 | $ 1,600.0 | | | | |
| Economic Development Grant Program [2] | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ - | $ 500.0 | $ 1,000.0 | $ 1,500.0 | | | | |
| | Total | $ - | $ 500.0 | $ 1,000.0 | $ 1,500.0 | | | | |
| Newtown Creek | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 667.9 | $ 681.5 | $ 695.1 | $ 708.5 | | | | |
| | Total | $ 667.9 | $ 681.5 | $ 695.1 | $ 708.5 | | | | |
| Hydrogen Blending Study | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 23.7 | $ 11.3 | $ - | $ - | | | | |
| | Total | $ 23.7 | $ 11.3 | $ - | $ - | | | | |
| FOH Engineering/RNG Interconnection | Labor & OH's | $ 312.4 | $ 319.3 | $ 328.3 | $ 333.6 | 2.4 | 2.4 | 2.4 | 2.4 |
| | Non-labor | $ 111.0 | $ 221.0 | $ 332.0 | $ 442.0 | | | | |
| | Total | $ 423.4 | $ 540.3 | $ 660.3 | $ 775.6 | | | | |
| Research, Development, and Demonstration | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 50.0 | $ 50.0 | $ 50.0 | $ 50.0 | | | | |
| | Total | $ 50.0 | $ 50.0 | $ 50.0 | $ 50.0 | | | | |
| Energy Efficiency | Labor & OH's | $ 574.1 | $ 586.7 | $ 603.3 | $ 612.9 | 3.8 | 3.8 | 3.8 | 3.8 |
| | Non-labor | $ 924.4 | $ 1,038.0 | $ 1,169.8 | $ 1,395.7 | | | | |
| | Total | $ 1,498.5 | $ 1,624.8 | $ 1,773.1 | $ 2,008.7 | | | | |
| | Grand Total | $ 6,182.1 | $ 7,601.4 | $ 9,015.4 | $ 10,472.2 | 8.3 | 9.3 | 10.0 | 10.0 |

Notes
1 Also presented in Exhibit___(RRP-3), Schedule 39
2 Also presented in Exhibit___(RRP-3), Schedule 37
3 All other line items presented in Exhibit___(RRP-3), Schedule 27

Exhibit ___ (FOH-13)
Schedule 1
Page 1 of 2

Keyspan Gas East Corporation
Future of Heat Incremental Operating Expense
Other Initiatives
($000's)

Exhibit ___ (FOH-14)
Schedule 2

| Future of Heat Expense Initiatives | | Expense Rate Year 2021 | Expense Data Year 2022 | Expense Data Year 2023 | Expense Data Year 2024 | FTE Count Rate Year 2021 | FTE Count Data Year 2022 | FTE Count Data Year 2023 | FTE Count Data Year 2024 |
|---|---|---|---|---|---|---|---|---|---|
| Green Gas Tariff | Labor & OH's | $ - | $ 162.5 | $ 167.3 | $ 169.9 | - | 1.0 | 1.0 | 1.0 |
| | Non-labor | $ - | $ - | $ - | $ - | | | | |
| | Total | $ - | $ 162.5 | $ 167.3 | $ 169.9 | | | | |
| UESC Program | Labor & OH's | $ 123.9 | $ 126.6 | $ 130.4 | $ 132.3 | 1.0 | 1.0 | 1.0 | 1.0 |
| | Non-labor | $ 137.5 | $ 332.5 | $ 470.0 | $ 560.0 | | | | |
| | Total | $ 261.4 | $ 459.1 | $ 600.4 | $ 692.3 | | | | |
| Fuel-Switching Calculator | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 125.0 | $ 18.0 | $ 18.0 | $ 18.0 | | | | |
| | Total | $ 125.0 | $ 18.0 | $ 18.0 | $ 18.0 | | | | |
| Demand Response Demonstration Project | Labor & OH's | $ 50.7 | $ 51.8 | $ 106.6 | $ 108.2 | 0.3 | 0.3 | 0.6 | 0.6 |
| | Non-labor | $ 576.9 | $ 719.9 | $ 814.4 | $ 1,004.0 | | | | |
| | Total | $ 627.5 | $ 771.7 | $ 921.1 | $ 1,112.2 | | | | |
| Expanded Geothermal Demonstration Project | Labor & OH's | $ 102.2 | $ 208.9 | $ 322.6 | $ 327.4 | 0.5 | 1.0 | 1.5 | 1.5 |
| | Non-labor | $ 877.5 | $ 1,687.5 | $ 2,970.0 | $ 3,960.0 | | | | |
| | Total | $ 979.7 | $ 1,896.4 | $ 3,292.6 | $ 4,287.4 | | | | |
| Low-to-Moderate Income Gas Conversion [1] | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 1,800.0 | $ 1,800.0 | $ 1,800.0 | $ 1,800.0 | | | | |
| | Total | $ 1,800.0 | $ 1,800.0 | $ 1,800.0 | $ 1,800.0 | | | | |
| Economic Development Grant Program [2] | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ - | $ 500.0 | $ 1,000.0 | $ 1,500.0 | | | | |
| | Total | $ - | $ 500.0 | $ 1,000.0 | $ 1,500.0 | | | | |
| Power-to-Gas Demonstration Project | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 650.0 | $ 1,825.0 | $ 725.0 | $ 325.0 | | | | |
| | Total | $ 650.0 | $ 1,825.0 | $ 725.0 | $ 325.0 | | | | |
| Hydrogen Blending Study | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 23.7 | $ 11.3 | $ - | $ - | | | | |
| | Total | $ 23.7 | $ 11.3 | $ - | $ - | | | | |
| FOH Engineering/RNG Interconnection | Labor & OH's | $ 258.0 | $ 263.7 | $ 271.5 | $ 275.6 | 2.2 | 2.2 | 2.2 | 2.2 |
| | Non-labor | $ 55.0 | $ 110.0 | $ 166.0 | $ 221.0 | | | | |
| | Total | $ 313.0 | $ 373.7 | $ 437.5 | $ 496.6 | | | | |
| Research, Development, and Demonstration | Labor & OH's | $ - | $ - | $ - | $ - | - | - | - | - |
| | Non-labor | $ 50.0 | $ 50.0 | $ 50.0 | $ 50.0 | | | | |
| | Total | $ 50.0 | $ 50.0 | $ 50.0 | $ 50.0 | | | | |
| Energy Efficiency | Labor & OH's | $ 593.7 | $ 606.9 | $ 624.8 | $ 634.2 | 3.8 | 3.8 | 3.8 | 3.8 |
| | Non-labor | $ 2,973.9 | $ 3,013.4 | $ 3,063.1 | $ 3,129.6 | | | | |
| | Total | $ 3,567.6 | $ 3,620.3 | $ 3,687.8 | $ 3,763.8 | | | | |
| | Total | $ 8,397.9 | $ 11,488.1 | $ 12,699.7 | $ 14,215.3 | 7.7 | 9.2 | 10.0 | 10.0 |

Notes

1 Also presented in Exhibit___(RRP-3), Schedule 39

2 Also presented in Exhibit___(RRP-3), Schedule 37

3 All other line items presented in Exhibit___(RRP-3), Schedule 27