National Grid US

Natural Gas Long-Term Capacity Status Report for Brooklyn, Queens, Staten Island and Long Island (“Downstate NY”)

December 2021

1. The Recommended Distributed Infrastructure Solution to close the Demand-Supply Gap

In May 2020, National Grid (the "Company") published the Natural Gas Long-Term Capacity Supplemental Report (the "Supplemental Report"), in which the Company presented the Distributed Infrastructure Solution to close the projected Design Day Demand-Supply Gap.[1] The Distributed Infrastructure Solution is a combination of incremental energy efficiency ("EE") and demand response ("DR") programs and enhancement projects that expand the capacity of existing gas infrastructure. This solution is a portfolio approach that best balances cost, reliability, and feasibility to address the projected Demand-Supply Gap. In June and August 2021, the Company published the Second and Third Supplemental Reports, respectively, that presented the Company's latest gas demand forecast, confirmed the need for the Distributed Infrastructure Solution, described the status of and risks to successful implementation of the Distributed Infrastructure Solution, and responded to stakeholder feedback. In September 2021, PA Consulting published an independent assessment conducted for the New York State Department of Public Service. PA Consulting concluded that: the Distributed Infrastructure Solution is a reasonable solution to address the projected Demand-Supply Gap; the infrastructure enhancements are necessary; and our demand side management ("DSM") programs must reach scale and maturity as quickly as possible.

Specifically, for the Distributed Infrastructure Solution, National Grid is combining: (1) incremental DSM programs, comprising an aggressive set of incremental EE over and above the targets set by the New Efficiency: New York Order, new gas DR programs, and Non-Pipe Alternatives; (2) the LNG Vaporization Option ("LNG Vaporization Project"), which adds two additional LNG vaporizers at National Grid's Greenpoint Facility; (3) the Iroquois Enhancement by Compression option ("ExC Project"), which involves the construction of additional compression facilities to increase capacity on the Iroquois Gas Transmission System; and (4) incremental portable CNG capacity, further expanding the largest CNG operation of its kind in the United States, which takes advantage of the maximum potential for National Grid to expand portable CNG in light of siting, operational and market constraints. Collectively, all of these components now make up the Distributed Infrastructure Solution as set forth in Table 1-1.

Table 1-1: Distributed Infrastructure Solution Components

Component	Gas Capacity / Demand Reduction *(MDth/day)*
Demand Side Management Programs	
Incremental EE	**Grows to 64**
Incremental DR	**Grows to 37**
Heat Electrification and NPA Market Solicitation	**Grows to 284**
Enhanced Infrastructure Projects	
LNG Vaporization Project	**59**
ExC Project	**63**
Incremental CNG Capacity	**18**

The Distributed Infrastructure Solution remains the best available solution to address the projected supply-demand gap and is consistent with NY's Net Zero goals; however, there continue to be significant risks to its successful implementation. Currently the greatest risk to implementation of the Distributed Infrastructure Solution are the permitting uncertainty and regulatory risks to the

[1] The Company's prior long-term capacity reports explain the Demand-Supply Gap and other relevant context and can be found at https://ngridsolutions.com/ as well as being filed in Case 19-G-0678 before the New York Public Service Commission.

infrastructure enhancements. Following that, with regards to the DSM programs, the greatest current challenge is scaling up the ability of the market to deploy the required amount of EE, and the Company anticipates future challenges in achieving shifts in customer behavior and adoption due to the unprecedented levels of these programs, and the unpredictable nature of customer participation. Our LNG vaporization project has already experienced multiple permitting delays and has thus been delayed by one year. Further delays may yield a demand-supply gap in 2023/24. The ExC Project requires its FERC certificate and state permits. There is no date certain by which the FERC must act, and the Company does not expect NY or CT to act until the FERC issues the certificate, further delaying implementation of another infrastructure enhancement that is critical to the success of the Distributed Infrastructure Solution. Our incremental CNG capacity project is proceeding on schedule, but faces siting and construction risks that could also delay anticipated in service dates. Our DSM programs require unprecedented scaling and rely heavily on voluntary customer participation. Global supply chain issues and our recent experience has highlighted resource constraints related to weatherization product availability and contractor capacity.

Our demand forecast contemplates that public policy and electrification efforts in New York State may eventually lead to some level of demand destruction, but such proposals, including the New York City Council's proposed ban on the use of natural gas in new buildings, do not eliminate the near-term need for the infrastructure enhancements included in the Distributed Infrastructure Solution.

Following is an update on each of the components of the Distributed Infrastructure Solution to close the gap between demand and supply, including our progress to date on its implementation and the risks to its successful completion.

2. Distributed Infrastructure Solution Component Status, Updates and Risks

In this section, we detail the following:

- An update, if any, on whether the project or program has changed from the Original Report and/or Supplemental Reports;
- The status of each component; and
- The key risks to the implementation of the component.

2.1. LNG Vaporization Project

LNG Vaporization Project Status and Update

National Grid has taken all necessary steps to bring the LNG Vaporization Project online but is waiting on final permits. Detailed engineering, procurement, and delivery of long lead materials have all been completed, environmental reviews and public meetings conducted, and fabrication is in progress, pending receipt of the necessary permits.

Specifically, the project requires NYC Department of Buildings (DOB), and FDNY approval for construction within NYC. Permitting also includes, but is not limited to, all federal, state and local NYC environmental permit requirements (e.g., NYC DEP and NYS DEC). National Grid filed for these permits in 2020.

Permits and approvals have been received from NYC DOB, DEP and FDNY. Other FDNY and DEC State Air Facility permits are still pending.

Assuming approval of all necessary permits in February 2022, the project could be completed for the 2023/2024 heating season. If the permits are delayed further, completion of this project would extend out to the 2024/2025 heating season.

LNG Vaporization Project - Risks to Implementation

Currently, the primary risk to implementation is not obtaining the necessary permitting for the project, or not obtaining them in a timely manner. Failure to receive required permitting by the Spring of 2022 may create a Demand-Supply Gap in 2023/24 without successful implementation of a contingency option.

Table 2-1: Key Risks to LNG Vaporization Project

Risk/Signpost	Likelihood	Impact	Description
Failure to obtain DEC permit	**HIGH***	**HIGH**	Without DEC permit, National Grid cannot construct the LNG Vaporization Project

*Changed from MEDIUM in prior report

2.2. Iroquois Enhancement by Compression ("ExC") Project

ExC Project Status and Updates

On May 27, 2021, FERC announced that it will prepare a supplemental Environmental Impact Statement (EIS) for the ExC Project; the final EIS was issued Nov 12, 2021, with FERC concluding that it is unable to determine the significance of the project's climate change impacts and that with that exception, found that ExC would not result in significant environmental impacts. A 7(c) certificate is not expected to be issued by the FERC prior to Q2 2022.The delayed receipt of these federal and state approvals could delay project completion into the 2024/2025 timeframe.

ExC Project – Risks to Implementation

Currently, the primary risk to implementation is Iroquois not obtaining all the necessary state and federal permitting for the project, or not obtaining them in a timely manner.

Table 2-2: Risks to ExC Project

Risk/Signpost	Likelihood	Impact	Description
Failure to obtain FERC approval and subsequent state and local permits	**HIGH***	**HIGH**	Without FERC approval, and then the state and local permits, Iroquois cannot move forward with the ExC Project.

*Changed from MEDIUM in prior report

2.3. Compressed Natural Gas (CNG) Trucking/Trailers Effort

CNG Trucking/Trailers Effort – Status and Updates

The Company is pursuing local and state-level approvals for implementation. These requirements will likely include coordination and/or approvals from first responders, stormwater permits for construction activities, or other local municipal approvals.

The Company is continuing to assess locations that would support this distributed supply resource. Generally, the selected site will require access to a location on the gas transmission system that could disperse the CNG widely throughout the DNY territory. The Company has also commenced procurement of long lead materials required for implementation of this solution. The Company is targeting to have the site constructed and ready for service for the 2022/23 winter, but continues to assess the required in-service date of the site to meet forecasted Design Day demand.

CNG Trucking/Trailers Effort – Risks to Implementation

A primary risk is the Company's ability to locate and procure land for this additional site. The CNG site requires multiple acres of land within close proximity to critical low pressure points on the gas transmission system that are zoned in industrial districts. This type of real estate is extremely difficult to find in the Downstate NY area.

Other risks are those that are consistent with complex projects of similar scope including: construction, procurement, availability of labor, market capacity, and permitting. These risks are mitigated through advanced stakeholder engagement, evaluation of properties owned by National Grid, advanced procurement of long lead materials, and codified complex capital delivery processes.

Table 2-3: Risks to CNG Project

Risk/Signpost	Likelihood	Impact	Description
Inability to procure land	**MEDIUM**	**HIGH**	Scarcity of available land in service territory could impact the size and scale of the additional site
Permitting risks	**LOW**	**HIGH**	Location-specific permitting and other risks typical to smaller construction projects; the company typically mitigates these risks through careful planning.

2.4. Demand-Side Solutions

The Distributed Infrastructure Solution relies on four major non-gas infrastructure options: energy efficiency ("EE"), demand response ("DR"), heat electrification, and Non-Pipe Alternatives ("NPAs"). Since the Original Report and Supplemental Reports, National Grid's planning for these options has come a long way in terms of innovative program design, and the Company proposed an unprecedented level of new DSM programs this year that are a fundamental part of the Distributed Infrastructure Solution.

The levels of DSM required to close the Demand-Supply Gap in the long term are unprecedented; in our peer benchmarking we have found no other utility who has attempted to roll out DSM programs at this scale so rapidly. Our Second Supplemental Report provided a conceptual example of how DSM strategies might be deployed in the longer term to address the projected Supply-Demand Gap. However, the programs, technologies, and business models that would be required to deliver such aggressive savings do not yet exist. We will continue to invest in the evolution of our DSM programs with the goal of maximizing their potential as non-infrastructure solutions.

The status and risks of each element is further described in the sections that follow.

2.4.1. Incremental Energy Efficiency

Incremental Energy Efficiency Program – Status and Updates

National Grid submitted the first Annual DSM filing on October 4, 2021. A decision from the NY PSC could come as early as March 2022.

National Grid soft-launched two new weatherization programs in the Fall of 2021: (1) a residential weatherization program; and (2) increased incentives for weatherization measures to commercial and multifamily customers through our existing C&I and Multi Family custom programs.

Incremental Energy Efficiency Program - Risks

There are numerous risks associated with this Incremental EE program. For one, the required level of weatherization scale up would exceed that of any peer programs studied, making it difficult to be certain about the projected savings. Another risk is that the level of weatherization and energy efficient gas equipment upgrades may saturate the market (reach a limit of feasible customer uptake) and therefore additional innovations will be required to meet both the NE:NY and incremental targets in Downstate NY beyond 2025. Other risks relate to costs, customer participation and regulatory concerns.

A description of the likelihood and impact of the key risks to both the NE:NY and Incremental EE programs set forth above is outlined in Table 2-4.

Table 2-4: Risks to DSM Program Success

Risks	Likelihood	Impact	Description
Market Resourcing	**HIGH***	**HIGH***	There are not currently enough market resources (contractors, vendors) to execute programs at required participation levels. National Grid is working hard to increase the contractor pool, support workforce development, and consider program design changes that will enable customers to bring their own contractors to the program.
Market Potential	**MEDIUM**	**HIGH**	Overestimation of market potential in that the DIS may be relying on more DSM than the market can deliver on time.
Costs & Adoption	**MEDIUM**	**HIGH**	Weatherization may continue to be uneconomical for customers, particularly LMI customers. May require increased incentives to spur adoption.
Persistent Increase in Cost of Building Materials	**MEDIUM**	**HIGH***	Costs of building materials are rising faster than the cost of inflation making projects less cost effective
Delays of Approval for Tariff Change	**MEDIUM**	**HIGH**	Increasing the EE mandate requires a tariff change that is subject to stakeholder and regulatory processes
Market Saturation	**MEDIUM**	**HIGH**	The market for EE measures may saturate earlier than forecasted, delivering less total demand day savings than needed.
Regulatory restrictions on incentivizing high efficiency gas equipment	**MEDIUM**	**HIGH***	If utilities are restricted from incentivizing high efficiency gas equipment in the future, including gas heat pumps, there is a risk that we will not be able to achieve long term EE targets
Supply Chain Issues**	**HIGH**	**HIGH**	Supply chain disruptions have delayed the implementation of some Wx projects to 2022

*Changed from MEDIUM in prior report
**New risk identified in this status report

2.4.2. *Demand Response*

Incremental DR Program Update

The Company has taken steps to deploy a portfolio of three firm demand response programs:

1. **CI&MF DR** focused on producing daily reductions in gas consumption;
2. **CI&MF DR** focused on producing peak hour reductions without requiring a reduction in daily gas consumption; and
3. **Residential/SMB BYOT DR**, which produces a more pronounced hourly impact as opposed to a daily reduction.

Program 1 is the largest program deployed to date. For the 2020/21 season, 156 facilities participated to reduce their usage over the gas day and to offer a potential reduction of 17.8 MDth on a Design Day (assuming 100% participation). Program enrollments for the 2021/22 season closed in October 2021, with 201 facilities enrolled as of year-end, and potential reduction of 21.1 MDth on a Design Day. The vast majority of participants in this program switch to an alternative fuel to participate in DR events, typically fuel oil, as their facilities have dual-fuel capabilities on-site; either because they previously were on a non-firm rate that required it, they have an operational mandate to do so (e.g., a resiliency requirement), or because they wished to retain fuel flexibility. The customers participating in this program are likely to be the same customers that would consider non-firm rates.[2] Therefore, it is possible that we could have customers transition from a firm DR program to a non-firm rate, or that we could have a non-firm customer submit a request to transition to a firm rate and then participate in a DR program. For this reason, we must carefully consider the incentive structures of the different programs so that we are not inadvertently motivating customer action that would make it more difficult to meet our system needs.

Program 2 is in its infancy, but closely mirrors the DR pilot that was instituted by the Company beginning in 2017. In Program 2, customers reduce gas usage during peak hours but will not be required to reduce total gas consumption over the entire peak day which offers an attractive, flexible option for customers who can reduce usage during key parts of the day (e.g. waiting to heat up their facilities, completing a production run at a different time), but are unwilling or unable to reduce their usage over a full day. Program 2 may be a valuable tool to manage our intraday demand profile. This program was first launched for the Winter 2021/2022 season. Program enrollments for the 2021/22 season closed in October 2021, with 28 facilities enrolled as of year-end, and potential reduction of 184 Dths for a Design Hour.

Program 3 is a BYOT program. Customers enroll their smart thermostats and provide National Grid with the authorization to adjust their setpoints during event hours. Enrollment into the BYOT program is on a rolling basis, and customers remain in the program unless they request to unenroll or are removed by National Grid for failure to adhere to program rules. As of this report, there are approximately 5,400 devices enrolled in the program, a 100% increase from the corresponding period last year. Eligible[3] customers in our Long Island territory were able to enroll for the first time in 2021. Data collected from this past winter show that customers reduced their usage during event hours, as well as a net daily reduction in usage. The Company plans to utilize learnings from the past winter and upcoming winters, as well as other customer research to increase program participation and refine or introduce new program features in future years.

When the Original Report was written, there was not a clear pathway to fund DR programs. National Grid had submitted a proposal in the then pending rate case that would have provided modest levels of funding ($2-$3M per year), but current plans and needs indicate that we will need significantly more ($8M in 21/22, increasing to $25M in 25/26). The Rate Case Order includes the ability to

[2] Non-firm rates provide the greatest amount of reduction on a Design Day, as customers are assumed to be curtailed throughout the full 24 hours. This is in contrast to Firm DR programs, where customer reductions are currently 4-8 hours of a Design Day. Therefore, a customer who is on a non-firm rate may be offering up to 3x more demand reduction than a DR customer. The incentive structure for firm DR has been established with the cost reduction from being on a non-firm rate as an upper bound.
[3] Due to a technical constraint a small subset of customers who are also enrolled in PSEG-LI electric DR program, are pending enrollment at this time. A resolution is in process.

recover costs for firm DR programs via two different surcharge mechanisms and makes allowances for the increased costs for the programs. This removes the funding risk that was described in the original reports for the DR component of the solution. Additionally, we have hired two full time employees (FTEs) who are focused on managing the Downstate NY DR programs, reducing some of the execution risk. These FTEs are working closely with our metering, regulatory, and gas operations groups to manage the DR portfolio growth, and to manage the non-firm customer class more actively.

Secondly, since the Original Report, the Company has received approval for proposed firm DR programs[4] ("Gas DR Order"). As directed by the Gas DR Order, the Company filed for Tariff Leaves Amendments to add the firm DR programs to the tariffs. These tariffs have currently been adopted on a temporary basis by the Public Services Commission, and are effective beginning November 1, 2021.

As of this report, the DR programs are in the middle of the 2021/22 winter capability period.

Incremental DR Program Risks

The main focus for DR is continuing to increase program participation and delivered savings, determining the right mix of programs (both firm and non-firm), and continuing to improve our understanding of the reliability of DR programs. Since inception, the programs have seen year-over-year growth, and we have seen a strong interest from customers, which is encouraging. Conversely, we have seen some low levels of performance during test events, which reinforces the need to understand the aggregate reliability of the DR portfolio as we increase our dependence on this resource. Similarly, it would be expected that program growth rates would start leveling after a certain level of market saturation.

The biggest implementation risks for demand response involves customer acquisition, retention, and performance. We need to increase the size of the DR portfolio, sell it every year (since we currently don't have multi-year enrollment structures), and ensure that customers perform, both through ensuring they are prepared to perform, and creating incentives/penalties that align our goals with the goals of customers.

For the 2021/22 winter season, National Grid had planned to enroll as much as 27 MDth potential reduction on a Design Day to the Daily DR program. Enrollments into the Daily DR program closed at 21.1 MDth potential reduction on a Design Day. Preliminary analysis from the 21/22 enrollments highlight the need to further investigate market potential, refine program design and features, reconsider the incentive structure and program targets, and further explore third party participation and regulatory policy, as we work towards scaling the DR program to the quantities proposed in the Supplemental Report. We will continue to utilize the learnings from past season enrollment experience, as well as program performance to refine the potential of firm DR programs.

In addition to customer-centric approaches such as targeting and marketing, education and outreach material, the Company has also addressed customer performance by adopting a direct load control (DLC) arrangement for firm DR customers; where we install a device at customer sites that curtails their usage and, if applicable, switches them to a backup fuel similar to arrangement for some non-firm customers. The non-firm customer class has a reliability of ~95% during curtailments so adopting a similar control structure may lead to a similar level of performance reliability. The penalties for non-performance during non-firm curtailments are significant such that it provides a motivation for customers to perform, even if they would otherwise override the DLC setup. We have

[4] Case 19-G-0086 and 19-G-0087, *Order Authorizing Tariff Amendments To Effectuate Gas Demand Response Programs For Firm Gas Customers*, October 07, 2021

established both DLC and non-DLC tiers for our firm DR programs so that we can begin to test whether there is a quantifiable difference between DLC and non-DLC tiers. However, as of now the penalty of non-performance is minimal for firm DR customers[5]. By measuring the reliability of the participants in different tiers, we can begin to improve our forecasts for firm DR performance and market potential.

Finally, the impact of customers moving from non-firm to firm rates, despite the improved economics of non-firm rates, remains a risk.

A summary description of the likelihood and impact of certain risks to DR performance is outlined in Table 2-5.

Table 2-5: DR Risks

Risk/Signpost	Likelihood	Impact	Description
Customer Adoption/Retention Too Low To Meet Target	**HIGH***	**HIGH**	We have aggressive targets for deploying DR in the coming years. If customers do not sign up for the program, we will not be able to satisfy the component of the portfolio solution associated with DR.
DR Reductions Are Not Reliable	**LOW/MEDIUM**	**HIGH**	If DR reductions are not reliable, we may not be able to plan around them, even if we are able to develop/sell programs

*Changed from MEDIUM in prior report

2.4.3. *Incremental Heat Electrification*

Incremental Heat Electrification Status and Updates

National Grid requested resources and technical support services through its First Annual DSM Filing to support this ongoing work.

Collaboration will also be an integral part of an incremental heat electrification program's success, and the Company has started working with the EDCs to discuss what that might look like. The coordinated effort focuses on laying out the regulatory framework to prepare for much greater levels of heat electrification in the future with a joint emphasis on determining the most economical way to meet the demand gap through heat electrification. A potential pilot in collaboration with the EDCs and other industry partners is in discussion. The goals of the studies and pilot to be conducted may include:

- Influencing more full load conversions within the existing EDC programs
- Influencing higher levels of heat electrification adoption in gas constrained areas
- Testing of incentive levels and strategies to accelerate market penetration over Baseline Electrification
- Determining how to drive customers to electrify heat prior to failure of their existing gas systems (early replacement)
- Enhanced marketing, outreach, market potential, customer education on top of existing EDC and statewide initiatives
- Identifying framework required for consultation with EDCs on impacts to their electric networks and suggested approaches to mitigate those impacts (e.g. supporting an electrical "make ready" program to address increased electrical loads)

[5] C&I customers are not eligible to receive Performance Payments in a month where the enrolled account's Performance Factor is less than 25%. In case of BYOT program, the Companies reserve the right to cancel a customer's participation in the program if they participate in fewer than 15% of event hours during a season

- Determining barriers to accelerated heat electrification such as workforce development, in collaboration with existing EDC and statewide initiatives
- Pursuing studies to reveal new solutions and strategies
- Determining incentives required for accelerated electrification of heat required for low-and moderate income customers and environmental justice zones

Throughout this process, the Company will also leverage collaboration opportunities and shared resources with NYSERDA to reach the goals mentioned above.

The levels of heat electrification assumed as part of the Distributed Infrastructure Solution are aspirational due to the unprecedented levels required. At this moment, we have not identified the programs, measures/technologies, business models or budgets that could produce these levels of DSM. The exact programmatic composition, utility responsibilities and incentive levels required to influence this level of adoption will evolve as policy, regulation and our experience of cutting-edge gas DSM evolves. National Grid is committed to finding solutions, innovating and collaborating as part of our ongoing DSM efforts in Downstate NY.

In the event there are delays to or rejections of the LNG Vaporization Project or ExC Project, some of the aggressive heat electrification may need to be accelerated, which would have significant execution risk given the amount of development work required and the scale at which would need to be implemented.

Incremental Heat Electrification - Risks

The levels of electrification of heat required to close the Demand-Supply Gap are unprecedented; in our peer benchmarking we have found no other utility who has attempted to roll out electrification of heat programs at this scale so rapidly. The Second Supplemental Report provides a conceptual example of how electrification of heat might be deployed in the longer term to address the projected Supply-Demand Gap. However, the regulatory authorities, budgets, programs, technologies, and business models that would be required to deliver such aggressive savings do not currently exist.

A description of the likelihood and impact of certain risks to incremental heat electrification set forth above is outlined in Table 2-6.

Table 2-6: Heat Electrification Risks

Risk/Signpost	Likelihood	Impact	Description
Market Resourcing	**HIGH***	**HIGH**	There may not be enough market resources (contractors, vendors) to execute required number of projects.
Market Potential	**HIGH***	**HIGH**	Overestimation of market potential and ability to reach accelerated levels of adoption. .
Customer Value Proposition & Adoption	**HIGH**	**HIGH**	Heat Electrification may continue to be uneconomical for customers, particularly LMI customers and will likely require higher incentives to spur adoption. Customer's may not choose to electrify their heat unless mandated by state/government due to lack of familiarity with technology, low cost of gas, high cost of electric and concern around perceived reliability with cold-climate heat pumps
Costs	**HIGH**	**HIGH**	Incremental heat electrification costs are significantly higher than all other EE programs and would result in ~10% bill increase LMI programs that align with this acceleration of heat electrification will cost even more than a market rate heat electrification program
Delays in executing MOU, electric system constraints, legal and regulatory processes	**HIGH***	**HIGH**	Incremental heat electrification would require an MOU with EDCs and permission from the PSC. Gas utilities are not currently permitted to incentivize heat pumps in NY
Supply Chain**	**HIGH**	**HIGH**	Supply chain disruptions may limit the speed to scale incremental electrification of heat
Consistency with CLCPA**	**HIGH**	**HIGH**	There is a concern that it may be inconsistent with the CLCPA to spend rate payer money on an electrification of heat program solely to enable continued gas connections

*Changed from MEDIUM in prior report
**New risk identified in this status report

2.4.4. *Non-pipeline alternatives (NPAs)*

NPAs – Status and Update

National Grid has developed an NPA framework this year. In parallel, we are engaging with the market (i.e. third-party solutions providers) to better understand what solutions they may be able to provide in response to future NPA RFPs. We released our first NPA RFP on December 13, 2021.

During the process of developing the RFP, National Grid worked with REV Connect/Guidehouse to conduct a Mini Sprint outreach to potential responders for this RFP. In addition, we discussed the RFP with Con Edison, to gain insights from the previous experience with NPAs.

NPAs - Risks to Implementation

There is still uncertainty for the levels of demand reductions available through NPAs. Though third-parties will be able to offer proposed solutions, these solutions may represent similar types of DSM solutions as those proposed by National Grid. As the market becomes more familiar with NPA solicitations, however, it is likely that our ability to deploy NPAs that are complementary to any planned programs will improve.

3. Contingency Plan Status

In the event certain circumstances prevent or delay the Distributed Infrastructure Solution from being fully implemented, National Grid has evaluated alternative approaches to solve the projected Demand-Supply Gap, including both alternative infrastructure projects and additional non-gas infrastructure options.

In a scenario where one or more of the Distributed Infrastructure Solution enhancements to existing infrastructure are denied, the lead time and feasibility for any alternative approach would entail significant risk that projected customer demand could not be met. The alternative approaches that best balance cost and feasibility would include incremental gas demand response and heat electrification along with substitute infrastructure projects—specifically, the Clove Lakes Transmission Loop project and/or an LNG Barge project—but all alternative approaches have much higher costs and greater risks to successful and timely implementation than the Distributed Infrastructure Solution.

3.1. LNG Barges

This project is currently conceptual and will be further evaluated pending the status of the ExC project.

3.2. Clove Lakes Loop

This project is currently conceptual, but more detailed engineering work will target a Complex Project Gate A approval in January 2022 in the Company's internal stage-gate process, after which National Grid will move forward with more detailed studies as appropriate.

3.3. Accelerated Electrification of Heat

National Grid is in discussions with ConEd regarding a collaborative accelerated electrification of heat proposal. The first hurdle toward program development is ascertaining the levels of accelerated full electrification of heat that could be procured in the short term in a cost-effective manner. Small teams are working on reviewing market evaluation, program design, and the development of an MOU term sheet.

A significant barrier to accelerating electrification of heat, beyond technical feasibility, is obtaining the regulatory authority for a gas utility to incentivize electrification and obtaining a cost recovery mechanism. We estimate that accelerated electrification may cost National Grid and the EDCs approximately $1.2 Billion through 2025, which is several multiples of the entire NE:NY Statewide Clean Heat program through the same period. Program incentives may result in a ~10% increase in gas bills.

There is also a question whether such a large investment in electrification of heat for the sole purpose of creating room on the system for new gas customers, even if feasible, would be consistent with the New York CLCPA.

3.4. Additional Demand Response Options

National Grid is exploring new program design options that will increase the demand reduction capabilities of customers on the design day. National Grid is also exploring participation in demand response of customers with smaller demand reduction capabilities.

To date, National Grid has only called test events and has not called any events under design conditions, due to warmer winter conditions in the past year. Learnings from implementing the program, customer enrollment periods as well as events under design conditions, will inform the market potential and reliability of demand response programs.

Additionally, National Grid is exploring options to retain existing non-firm customers on non-firm rate over and above rate changes that were implemented earlier this year, to make non-firm rates favorable to customers.

4. Potential Risk for Moratorium

In the event that any component of the Distributed Infrastructure Solution faces setbacks to their successful and timely implementation, there is a substantial risk that National Grid will not be able to meet projected customer demand in the coming years as early as Winter 2023/24 given the implementation risks associated with any alternative approach. Faced with an inability to meet projected customer Design Day demand, a targeted pause in new customer connections could be required before the Winter of 2023/24, and if significant supply challenges remain, as a last resort, reliance on customer curtailment under peak demand conditions. The most immediate risk facing the Distributed Infrastructure Solution is the need for approval of the DEC state air permit for the LNG Vaporization Project, where the implications for the risk of restrictions on new customer connections may become evident as early as February 2022.