Ontario Energy Board | Commission de l'énergie de l'Ontario

BY EMAIL

November 12, 2020

Ms. Christine E. Long
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
Registrar@oeb.ca

Dear Ms. Long:

Re: Ontario Energy Board (OEB) Staff Evidence
Enbridge Gas Inc. – Integrated Resource Planning Proposal
OEB File Number: EB-2020-0091

In accordance with Procedural Order No. 4, please find attached a report "Natural Gas Integrated Resource Planning in New York State and Ontario", produced by Guidehouse Canada Ltd ("the Guidehouse report"), which OEB staff are filing as expert evidence in this proceeding. The report is accompanied by a signed Form A, acknowledging the expert's duty to the OEB.

In line with OEB staff's description filed on July 29, 2020, the Guidehouse report provides expert analysis of natural gas IRP in New York State, in comparison with each of the IRP issues in the issues list for the EB-2020-0091 proceeding and Enbridge Gas's IRP proposal in that proceeding, and provide recommendations for natural gas IRP in Ontario based on the jurisdictional analysis.

The Guidehouse report takes account of updates to Enbridge Gas's IRP proposal that were filed as part of Enbridge Gas's August 15, 2020 update.

OEB staff also notes that the updated evidence filed by Enbridge Gas included an Appendix A, "IRP Jurisdictional Review Report", prepared by ICF Canada ("the ICF report"). The ICF report also includes analysis of IRP in New York State, and has significant overlap with the Guidehouse report. This amount of overlap was not foreseen by OEB staff, based on the descriptions of proposed evidence filed by Enbridge Gas and OEB staff on July 29, 2020.

The Guidehouse report does not review or directly respond to the conclusions

reached in the ICF report, but presents an independent review of the IRP experience in New York State and implications for Ontario. In particular, OEB staff believe that the Guidehouse report provides additional insights into the interaction between IRP and other aspects of natural gas system planning, cost-benefit analysis in the context of IRP, and cost recovery/incentive mechanisms.

The attached document has been forwarded to Enbridge Gas Inc. and to all other parties to this proceeding.

Yours truly,

Original Signed By

Michael Parkes
Project Advisor, Application Policy & Conservation

Encl.

FORM A

Proceeding:..EB-2020-0091……

ACKNOWLEDGMENT OF EXPERT'S DUTY

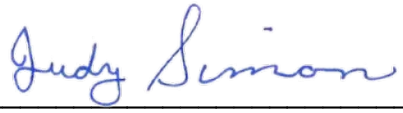
1. My name is Judy Simon (*name)*. I live at Toronto (*city)*, in the province (*province/state*) of Ontario.

2. I have been engaged by or on behalf of ....OEB Staff..... (*name of party/parties)* to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.

3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
   (a) to provide opinion evidence that is fair, objective and non-partisan;
   (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
   (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.

4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date ....November 12, 2020.....



Signature

Guidehouse

Natural Gas Integrated Resource Planning in New York State and Ontario

FINAL REPORT
Prepared for:

Ontario Energy Board

ONTARIO ENERGY BOARD

Submitted by:

Guidehouse Inc.
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Reference No.: 214637
November 12, 2020

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Executive Summary

Introduction and Approach

The Ontario Energy Board staff (the OEB staff) contracted Guidehouse Canada Ltd. (Guidehouse) to provide expert support to contribute to the OEB's review of integrated resource planning (IRP) for Enbridge Gas in the regulatory proceeding EB-2020-0091. Guidehouse prepared this report to provide a summary of key IRP activities in New York State, a side-by-side comparison with each of the IRP issues in the Issues List for the EB-2020-0091 proceeding (Issues List) and Enbridge Gas's IRP original proposal in that proceeding (Enbridge Gas IRP Proposal), as well as Enbridge Gas's Additional Evidence filed with the OEB on October 15, 2020. Enbridge Gas provided recommendations for natural gas IRP in Ontario in this evidence.

The analysis in our report focuses on the IRP experience of natural gas utilities in New York State, in particular, Consolidated Edison Inc. (Consolidated Edison Company of New York Inc. (CECONY); Orange and Rockland Utilities, Inc.; jointly referred to hereafter as "Con Edison") and National Grid (National Grid US, including KeySpan Energy Delivery New York (KEDNY), KeySpan Energy Delivery Long Island (KEDLI), and Niagara Mohawk operating areas; referred to hereafter as "National Grid"). The analysis focuses on the CECONY and KEDNY/KEDLI operating areas, which have the most experience with these topics, but also includes details on current and future IRP activities by other New York State natural gas utilities.

Guidehouse prepared this report based on a document review of public reports and regulatory filings, as well as interviews with key staff at Con Edison and National Grid. The New York State Public Service Commission (PSC) has an ongoing proceeding to investigate and improve natural gas planning procedures in New York State, and may result in changes to the IRP processes in New York State. New York Department of Public Service (DPS) staff are expected to publish a whitepaper that outlines a proposal to modernize the gas system planning before November 16th, 2020.[1]

Industry Best Practices for Natural Gas IRP

Section 1.0 and Section 2.0 of this report provide an introduction and Ontario overview, respectively. Section 3.0 and Section 4.0 provide background on IRP drivers for New York State as well as detailed descriptions for Con Edison's Smart Solutions Program and similar programs in New York State. This list below summarizes the key characteristics and best practices from the natural gas IRP programs we analyzed, as well as lessons learned, and planned improvements identified by Con Edison and National Grid program managers regarding their own IRP experiences. The best practices and key characteristics identified include:

- Developing Benefit Cost Analysis (BCA) procedures that evaluate infrastructure, supply-side, and demand-side solutions with a similar set of assumptions and recognize the risks associated with traditional vs. emerging options can allow for a more transparent IRP process.

[1] This date has been delayed several times and may be further delayed. On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020. The OEB should check the NYS Gas Planning Proceeding around this date for further updates. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-g-0131&submit=Search

- Utility program managers implementing demand-side IRP solutions require flexibility to adjust recruitment strategies, incentive amounts, budgets, operating procedures, and other parameters to achieve the goals of the programs.
- Non-traditional supply-side and demand-side solutions carry greater uncertainty compared to traditional infrastructure projects, and utility program managers have overcome these risks by oversubscribing customers and diversifying the IRP solutions. Traditional demand-side solutions such as energy efficiency or heating electrification have a higher degree of certainty of load reduction for each participant whereas demand response (DR) carries greater uncertainty of demand reduction on peak days because it is dependent on customer behavior on those days. To address these issues, utilities deploy a broad mix of solutions, but are cognizant of and adjust for these different levels of certainty. The initial pilot programs being deployed now will provide greater insight into more standardized assumptions for reliability.
- Deploying a diversity of IRP solutions is important to reduce risks in achieving the project goals. Smaller IRP projects may be able to achieve goals in a shorter timeline by expanding existing energy efficiency (EE) or DR programs, whereas larger IRP projects may be best suited for market solicitations and new program developments that have longer timelines.
- Evaluation, Measurement and Verification (EM&V) of IRP initiatives is critical both to confirm demand reduction as well as to ensure customer compliance with program goals and requirements. For example, Con Edison performed EM&V within their Demand Response program to measure the 24-hour gas demand reduction on a peak day and verify that customers did not offset gas consumption with fuel oil, which contradicts the program's environmental goals. Through the Gas DR pilot programs, Con Edison found performing EM&V for demand-side IRP solutions is more challenging without gas Advanced Metering Infrastructure (AMI) deployed across the service territory. There are opportunities to perform EM&V without AMI, but these carry higher costs per unit of peak day reduction (see Section 4.1.3). As experience is gained and lessons are learned from EM&V, firmer conclusions and guidance can be developed about performance, cost effectiveness, and robustness of results.
- New York State utilities have found the operational processes, program design, benefit-cost analyses, and other parameters for the Gas IRP solutions can be similar to existing gas energy efficiency programs or electric Non-Wires Alternative (NWA) programs. The NWA pilots have suggested significant investment in organizational resources (e.g., dedicated time for cross-functional managers and experts, IT system development, internal training updates) is needed upfront to develop the necessary internal processes and operationalize the programs, but that can be useful across both gas and electric IRP solutions. Nevertheless, they have found key differences relating to limitations around space heating end-uses, building codes, customers switching to fuel oil, and other issues that require separate sets of guidelines. The level of investment necessary to operationalize IRP programs will vary based on the capacity, expertise, and experience of utility staff and their current programs, as well as experiences of neighboring utilities that share similar regulatory processes.
- IRP programs take significant time to develop, recruit, launch, and scale and may not align with the timelines of gas planning or engineering departments when looking at traditional infrastructure projects. Of note is that different IRP solutions have different lead times; for example, a DR program may have a shorter lead time than an electrification program. By taking these differences into account, utilities can use a mix of

these IRP programs to reduce load before committing to more expensive infrastructure projects.

- Gas utilities recognize that core planning processes including gas supply and transportation planning, infrastructure maintenance and expansion planning, energy efficiency / demand-side management planning, and IRP planning are interconnected and interdependent. For this reason, gas utilities are seeking to identify how to integrate these processes and sequence the activities to ensure that each planning process properly captures the output of adjacent processes. Having regular discussion with regulator and stakeholder groups around the needs for capacity additions, IRP solutions, and program design plans can reduce uncertainty and facilitate success.
- Regulators need to design the proper incentives for utilities to pursue IRP solutions, including cost-recovery and sharing risk amongst stakeholders similar to a traditional infrastructure investment. Earnings Adjustment Mechanisms (EAMs) have been successful in New York State in aligning the goals of the utilities, regulators, and key stakeholders, although their long-term effectiveness is still uncertain.

Key Findings from Comparative Analysis of Issues List

Section 5.0 provides a detailed side-by-side comparison of Enbridge Gas's IRP proposal and New York State utility experiences with each of the ten IRP issues in the Issues List for the EB-2020-0091 proceeding. This following list summarizes the key findings from the analysis:

- New York State gas utilities and the PSC have developed a range of gas IRP solutions to address pipeline expansion limitations, peak demand reduction needs, the need to avoid moratoria on new customers, and other goals. The utilities developed the regulatory framework and operational practices to execute the programs in a short period of time. These programs were developed in reaction to urgent issues affecting system reliability, particularly related to delayed and cancelled pipeline capacity projects and/or due to political and environmental pressures. The New York PSC and gas utilities are currently working towards a modernized gas planning framework that will consider supply-side, demand-side, and distribution solutions to meet customer demand while meeting statewide decarbonization goals. More details will be available in the DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[2]
- Enbridge Gas and the OEB have taken a proactive approach to develop a Gas IRP framework. Enbridge Gas's proposed goal is to develop a framework to guide Enbridge Gas's assessment of IRP alternatives (IRPAs) relative to other facility and non-facility alternatives to serve the forecasted needs of Enbridge Gas customers. Ontario already has a framework for the deployment of natural gas Demand Side Management (DSM) programs. Enbridge Gas's IRP Proposal includes a definition of eligible IRPAs, screening and selection criteria for IRPA vs. traditional facility projects, monitoring and reporting guidelines and other elements that attempt to solidify the IRP Framework as a standalone construct that is distinct from the DSM and facility project frameworks.
- Enbridge Gas proposes using a traditional Discounted Cash Flow (DCF) analysis to value IRPA in order to compare these on an equal footing with traditional infrastructure. This approach is defined in the OEB's guidance from proceeding E.B.O. 134, and the

[2] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

environment for cost benefit analysis has evolved significantly since this methodology was originally developed. Con Edison has developed a formal BCA handbook, which includes a detailed methodology for calculating all the benefits and costs of particular IRPAs as well as examples of different types of IRPAs, such as: demand response, renewable natural gas (RNG). The BCA captures all the costs and benefits and can facilitate a transparent discussion with stakeholders.

- Enbridge Gas has indicated that deploying an AMI system will help enable the IRP framework, as these meters can allow Enbridge Gas to collect hourly peak demand data and target the most effective deployment of IRPA.[3] Con Edison is in the process of deploying AMI infrastructure across its service territory and has deployed IRP solutions in areas with and without AMI installed. Con Edison has indicated that performing demand-side IRP programs without such infrastructure is feasible but carries additional challenges and costs.
- The experiences to date in New York State with gas IRP solutions through Con Edison Smart Solutions and National Grid Non-Pipeline Solution (NPS) programs, as well as pilots with other gas utilities, provide insight into the opportunities and challenges when relying on non-traditional solutions to defer pipeline investments. Furthermore, these gas IRP solutions leveraged the program designs and operating procedures from existing energy efficiency and electric NWA programs.

Section 6.0 outlines several key differences between the Enbridge Gas service territory and those of New York State gas utilities that may be relevant to IRP implementation and that should be taken into consideration in a comparative analysis.

Recommendations

The following list summarizes Guidehouse's key recommendations for the OEB to consider when reviewing Enbridge Gas's IRP proposal and evaluating opportunities to implement natural gas IRP in Ontario:

1. The OEB should encourage the development of a comprehensive Benefit Cost Analysis (BCA) Handbook for Gas IRP, or supplemental guide to the approach outlined in E.B.O. 134 , that evaluates infrastructure, supply-side, and demand-side solutions with a similar set of assumptions for costs and benefits. Stakeholders can provide comment on the proposed BCA Handbook / supplemental guide and build an understanding of the costs, benefits, and risks for different IRP options, and allow for a more transparent IRP process.
2. The OEB should work to more closely align and sequence the planning activities for gas supply, demand, infrastructure, energy efficiency (EE)/demand-side management (DSM), IRP, Utility System Plans (USPs) and other relevant matters, wherever possible. Developing an IRP framework that describes the importance of different planning activities and how the individual activities inform the IRP planning process will allow for more consistent outcomes. For example, filings and related proceedings around gas supply, transportation planning, infrastructure maintenance, and EE/DSM will have

[3] Guidehouse notes that there are concerns in Ontario regarding the cost and efficacy of AMI due to prior experience with electric smart meters.

relevance for identifying IRP needs and opportunities, and applying a logical sequencing can lead to a more consistent, up-to-date view of these matters for IRP planning.

3. Similar to above, the OEB should develop the gas IRP framework to be consistent with the regulatory framework for natural gas infrastructure approvals. This includes consistency with the OEB's Framework for the Assessment of Distributor Gas Supply Plans, USP filing requirements that are required for cost of service rate applications, and filing requirements and guidelines for approval of hydrocarbon pipelines and facilities, among other regulatory requirements.

4. It is recognized that the OEB considers provincial policy in its decision-making and is guided by statutory objectives (including a statutory objective related to natural gas to promote energy conservation and energy efficiency in accordance with the policies of the Government of Ontario, including having regard to the consumer's economic circumstances). To the extent that the OEB is providing direction that may influence or be impacted by provincial environmental and policy goals, the OEB should clearly define their underlying assumptions regarding applicable provincial policy goals. For example, since future gas demand scenarios are likely to be impacted by energy and environmental policy, clearly defining underlying assumptions relating to provincial climate change policies and decarbonization targets will help to better inform gas network infrastructure decisions going forward.

5. The OEB should work to establish a common understanding amongst stakeholders for the gas IRP process and how benefits, costs, risks, and other parameters will be shared by shareholders, ratepayers, and other parties.

6. The OEB should develop the gas IRP framework to provide utilities with sufficient flexibility to quickly adjust program designs, budgets, implementation plans, and other processes to adapt the IRP programs to each situation. Furthermore, incentives such as Earnings Adjustment Mechanisms (EAMs) should be considered to incentivize innovative approaches that may lead to more targeted outcomes or greater demand reductions. The long-term effectiveness of EAMs remains to be seen due to the limited track record of these incentives.

7. Should the OEB and the Independent Electricity System Operator (IESO) consider developing a specific electric Non-Wires Alternative (NWA) framework in the future, the OEB should consider aligning Gas IRP and Electricity IRP frameworks to share the cost and resource investments to develop operational processes, program design, benefit-cost analyses, and other aspects of either IRP proceeding.[4] Within New York State, leveraging the experience of electric NWA when developing the gas Non-Pipeline Solution (NPS) programs allowed for easier understanding and launch by utility, regulatory, customers, and other stakeholders. Improved coordination across electric and gas utilities will allow for more transparent analysis of the benefits and costs to achieve future provincial policy objectives.

[4] There are multiple other frameworks in Ontario that are similar to a NWA framework. These include the Regional Planning Process and Integrated Regional Resource Plans as well as the Conservation and Demand Management Frameworks, which have guidelines on how conservation should be incorporated in planning. The integration of these frameworks with the Gas IRP process could also be considered.

1.0 Introduction

The Ontario Energy Board staff (the OEB staff) contracted Guidehouse Canada Ltd. (Guidehouse) to provide expert support to contribute to the OEB's review of integrated resource planning (IRP) for Enbridge Gas in the regulatory proceeding EB-2020-0091. The OEB staff selected Guidehouse to prepare an expert analysis of natural gas IRP in New York State and assess its relevance to natural gas IRP in Ontario. The consideration, planning, and implementation of alternatives to natural gas infrastructure is more advanced in New York State than other North American jurisdictions, and an analysis of IRP in New York State is likely to provide insights as to the potential role and regulatory treatment of IRP in Ontario's natural gas sector.

The analysis in our report focuses on the IRP experience of natural gas utilities in New York State, in particular, Consolidated Edison Inc. (Consolidated Edison Company of New York Inc. (CECONY); Orange and Rockland Utilities, Inc.; jointly referred to hereafter as "Con Edison") and National Grid (National Grid US, including KeySpan Energy Delivery New York (KEDNY), KeySpan Energy Delivery Long Island (KEDLI), and Niagara Mohawk operating areas; referred to hereafter as "National Grid"). The analysis focuses on the CECONY and KEDNY/KEDLI operating areas, which have the most experience with these topics, but also includes details on current and future IRP activities by other New York State natural gas utilities (Appendix C). Con Edison provides electric and natural gas service to 1.1 million customers in New York City and Westchester county. National Grid provides natural gas in Downstate New York to 1.9 million customers throughout Brooklyn, Queens, Staten Island and Long Island.[5] Appendix D provides service territory maps for New York State gas utilities highlighted in this report.

Guidehouse has prepared this report based on a document review of public reports and regulatory filings, as well as interviews with key staff at Con Edison and National Grid.[6] The report provides a summary of key IRP activities in New York State, a side-by-side comparison with each of the IRP issues in the Issues List for the EB-2020-0091 proceeding (Issues List) and Enbridge Gas's IRP original proposal in that proceeding (Enbridge Gas IRP Proposal), as well as Enbridge Gas's Additional Evidence filed with the OEB on October 15, 2020.[7] Enbridge Gas provided recommendations for natural gas IRP in Ontario in this evidence.

Of note, as described in Section 3.0 of this report, the New York State Public Service Commission (PSC) has an ongoing proceeding to investigate and improve natural gas planning procedures in New York State. Under this proceeding, each gas utility has filed a series of reports on supply and demand forecasts, as well as supply-side and demand-side solutions to address anticipated vulnerabilities throughout their service territories. Department of Public Service (DPS) staff will review the provided materials and prepare a report to the proceeding that outlines a proposal to modernize the gas system planning. On September 16th, 2020, PSC granted DPS an extension to file the report by October 19th, 2020 and on October 16th, 2020,

[5] National Grid's KEDNY and KEDLI operating areas are gas-only, whereas the Niagara Mohawk operating area in Upstate New York is both gas and electric service.

[6] Guidehouse conducted one interview with each utility for approximately 45 minutes.

[7] Enbridge Gas's Additional Evidence also included an appendix, "IRP Jurisdictional Review Report" by ICF Canada, which included analysis of IRP in New York State. As Guidehouse was requested by the OEB staff to provide an independent assessment of IRP in New York State, the current report does not comment on the conclusions reached by ICF Canada in its October 2020 report.

PSC granted DPS an extension to file the report by November 16th, 2020.[8] Our descriptions for this proceeding are based on filings through to October 21st, 2020.

This report uses multiple terms for IRPA, which have been left in for alignment with source documents from other jurisdictions. The terms non-pipeline solutions (NPS), non-pipeline alternatives (NPA), and IRP solution are all used interchangeably with IRPA.

2.0 Overview of Ontario Gas System Planning and Policy

The natural gas delivery system in Ontario is regulated by the OEB, with the exception of pipelines that cross provincial borders. The OEB considers provincial policy in its decision-making and is guided by statutory objectives (including a statutory objective related to natural gas to promote energy conservation and energy efficiency in accordance with the policies of the Government of Ontario, including having regard to the consumer's economic circumstances). Enbridge Gas owns and operates the majority of the natural gas delivery infrastructure in Ontario. The province is supplied natural gas by the Western Canadian Sedimentary Basin, delivered to the province via the TransCanada Mainline, in addition to supply delivered from the Appalachian Basin in the United States via the Dawn Hub in southwestern Ontario. Due to the multiple delivery points and abundance of supply in both western Canada and the US, Ontario does not face major natural gas supply constraints at the transmission pipeline level.[9]

Demand Side Management (DSM) has been formally supported in Ontario since the 1993 E.B.O. 169-III Report of the Board, which set the regulatory framework for natural gas DSM programs in the province. The OEB has built upon and updated aspects of this framework through subsequent proceedings on DSM. DSM programs have been deployed in the province since 1995, with the most recent 2015-2020 DSM Framework being carried out from January 1, 2015 to December 31, 2020, and approval of Enbridge Gas's one-year DSM plan for 2021. The 2015 – 2020 DSM Framework included a requirement that "As part of all applications for leave to construct future infrastructure projects, the gas utilities must provide evidence of how DSM has been considered as an alternative at the preliminary stage of project development".[10]

A Post-2020 Natural Gas DSM Framework Consultation is currently being carried out by the OEB to determine the future of gas DSM in the province after the current 2015-2020 DSM Framework expires. In parallel, the OEB is holding a proceeding on a framework for IRP of natural gas facility alternatives. The Post-2020 Natural Gas DSM Framework Consultation is being monitored as it relates to traditional DSM activities in Ontario.

As described in the 2017 Filing Requirements for Natural Gas Utilities, a Utility System Plan (USP) is required to be included in all natural gas utility cost of service rate applications to the OEB.[11] The USP covers all regulated above and below ground assets (i.e. distribution, storage, transportation system). At a high level, the USP includes investment, engineering and asset management plans, long term economic and planning assumptions, highlights of recent

[8] This date has been delayed several times and may be further delayed. On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020. The OEB should check the NYS Gas Planning Proceeding around this date for further updates. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-g-0131&submit=Search

[9] EB-2019-0137 – Enbridge Gas Inc. – 5 Year Gas Supply Plan
http://www.rds.oeb.ca/HPECMWebDrawer/Record/653158/File/document

[10] Ontario Energy Board. "Demand Side Management Framework for Natural Gas Distributors." April 10, 2014.
https://www.oeb.ca/industry/policy-initiatives-and-consultations/demand-side-management-dsm-framework-natural-gas

[11] Natural gas cost of service applications are to be filed one year prior to the proposed effective date of new rates.

OEB. Filing Requirements For Natural Gas Rate Applications. February 16, 2017.
https://www.oeb.ca/oeb/_Documents/Regulatory/Filing_Requirements_Natural_Gas_Rate_Applications.pdf

proposed investments, linkages to the utility's gas supply plan, and a description of how the needs of customers and Ontario policy are being reflected.

In 2018, the OEB adopted a Framework for the Assessment of Distributor Gas Supply Plans. In order to implement the Framework, natural gas distributors are required to submit to the OEB a comprehensive five-year gas supply plan for a detailed review once every five years. In addition, distributors will submit an annual gas supply update that focuses on the changes to the supply and demand conditions and includes a retrospective view of the plan's performance. The OEB has defined guiding principles that are consistent with its legislated mandate to protect the interests of customers with respect to price and the reliability of gas service. The guiding principles for a distributor's gas supply plan are to deliver gas supply that is cost-effective, reliable (secure) and achieves public policy objectives.

Prior to the IRP Proposal submitted by Enbridge Gas on November 1, 2019, there was no formal IRP framework in place. Further, Enbridge Gas does not have a history of carrying out demand response (DR) programs or targeted DSM procurements to avoid or delay the building of traditional natural gas facility projects.[12] Enbridge Gas does offer an interruptible rate program to curtail customer demand in times of supply or capacity need. Enbridge Gas's IRP Proposal seeks to develop a framework for the effective implementation of IRPAs for traditional facility projects.

Ontario has established an Environment Plan targeted on reducing greenhouse gas (GHG) emissions by 30% below 2005 levels by 2030.[13] This is an economy-wide approach, which identifies planned emission reductions from natural gas conservation and the use of renewable natural gas (RNG), but there has been no specific direction from the province for the OEB to require the natural gas utilities to implement GHG reduction targets. The Ontario government has noted that the plan will continue to evolve with new information and actions.

3.0 Integrated Resource Planning in New York State Overview

This section provides a brief overview of the historical IRP practices in New York State, as well as the environmental policies that shape the need for IRP activities and current regulatory proceedings around future gas planning and other potential enabling procedures to align with these policies.

3.1 New York State Environmental Policies

New York State has committed to ambitious climate goals in the Climate Leadership and Community Protection Act (CLCPA), enacted in 2019, including 100% carbon-free electricity by 2040 and 85% GHG emissions reduction by 2050.[14] In addition, New York City and other local governments throughout the state have their own commitments, including New York City's carbon neutrality goal of 2050. New York State leaders have not determined the exact pathway to reach these goals, but are currently evaluating different economy-wide strategies through the CLCPA Climate Action Council and Advisory Panels.[15] Many stakeholders in New York State

[12] Enbridge Gas has supported pilots that included electrification technologies (e.g. hybrid electric heat pumps).

[13] Government of Ontario. "A-Made-in-Ontario Environment Plan." November 29, 2018. https://www.ontario.ca/page/made-in-ontario-environment-plan

[14] New York State Climate Act https://climate.ny.gov/

[15] New York State Climate Action Council https://climate.ny.gov/Climate-Action-Council

question the future role of natural gas infrastructure to serve building, industrial, transportation, and electric generation end-uses. Preliminary Pathways modeling performed by E3 for the CLCPA Climate Action Council highlights the significant emphasis on end-use electrification to reach statewide goals.[16] Furthermore, the New York City mayor recently announced a plan to prohibit the use of natural gas in all large buildings by 2040 to support city targets.[17]

Downstate natural gas utilities, including Con Edison and National Grid, have seen significant demand growth in recent years driven by both population and economic growth in the service territory, but also by policy efforts to convert fuel oil heating customers to natural gas. The gas utilities have enacted a diverse approach to accommodate rapid increase in demand, including transmission pipeline expansions and traditional infrastructure approaches, as well as non-traditional approaches, such as compressed natural gas (CNG) / liquefied natural gas (LNG) injection, targeted EE/DSM, heating electrification and other strategies. Due to significant delays and challenges with pipeline projects by regulatory agencies, both utilities unilaterally enacted moratoria on new customer connections in specific parts of their service territory. Within the Supply / Demand Analysis in the Gas Planning Proceeding, Con Edison details the permitting challenges that have delayed or restricted the development of infrastructure projects over the last 5-10 years.[18] The New York State Department of Environmental Conservation's denial of multiple water permit applications[19] for the Northeast Supply Enhancement (NESE) project ultimately led the developer to abandon the project.[20] This pipeline cancellation primarily affected National Grid but also impacted Con Edison's long-term supply outlook. Section 4.0 describes these topics in greater detail.

It is Guidehouse's understanding that New York State policymakers have not made an explicit directive or policy announcement to date regarding the future of natural gas consumption within the state or restriction of further natural gas infrastructure. It is Guidehouse's further understanding that major stakeholders including regulatory agencies, gas and electric utilities, and real estate developers all recognize the overall policy direction and trend towards greater electrification of buildings, transportation, and industry. Nevertheless, there has not been a coordinated effort to address questions around future gas infrastructure investment to serve new and existing customers, maintain system safety and reliability, and potentially recover costs for stranded assets in the future. Many anticipate that the CLCPA Climate Action Council as well as the PSC Future Gas Planning Proceeding (Section 3.3) will provide greater insight into these topics when completed.

New York State policymakers and the PSC have a history of promoting utility-supported energy efficiency programs to support the state's environmental goals. In December 2018, the PSC adopted significantly accelerated utility energy efficiency targets under the governor's *New Efficiency: New York* plan, which will double utility energy efficiency achievement over 2019 to

[16] New York State Climate Action Council, Meetings and Materials https://climate.ny.gov/Meetings-and-Materials

[17] DiChristopher, Tom. "How New York City plans to end natural gas, oil use in buildings." February 25, 2020. S&P Global Market Intelligence https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/how-new-york-city-plans-to-end-natural-gas-oil-use-in-buildings-57232171#:~:text=Mayor%20Bill%20de%20Blasio%20recently,the%20Boston%20area%20and%20Seattle.

[18] Con Edison. "Proceeding on Motion of the Commission in Regard to Gas Planning Procedures – Supply/Demand Analysis for Vulnerable Locations." Case 20-G-0131. July 17, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FCF94472-7929-4594-8CD0-C3903FDE6927}

[19] Water permits were critical to the NESE project since major portions of the pipeline would have traveled under water between New Jersey and Long Island, New York.

[20] Reuters. "New York denies PA-NY Williams Northeast Supply natgas pipe." May 15, 2020. https://www.reuters.com/article/us-natgas-williams-pipeline/new-york-denies-pa-ny-williams-northeast-supply-natgas-pipe-idUSKBN22R3FT

2025.[21] These new regulatory requirements outline energy efficiency targets in terms of total trillion British thermal Units (TBtus) in site-level natural gas and electricity energy savings, including specific targets for incremental savings over previous commitments, 3% reduction in annual electricity sales, and new heat pump deployments.[22] Furthermore, the PSC developed a policy framework in 2015 for New York State utilities to demonstrate new technologies and test new business models under the New York Reforming the Energy Vision (NY REV) initiative.[23] This framework for developing new utility business models has been cited as an example for how New York State utilities can explore IRP solutions such as heating electrification and solicitations for third-party programs that could reduce the need for traditional infrastructure investment.[24]

3.2 Recent Moratoria on New Gas Customers

In recent years, both Con Edison and National Grid faced supply capacity risks and unilaterally enacted moratoria on new customer connections in certain parts of their service territories.

- **Con Edison in Westchester County**: In late 2018, Con Edison projected peak demand to begin exceeding supply in most of Westchester County by the winter 2020/2021, despite the [Smart Solutions] Program's forecasted achievements (detailed in Section 4.0). At the same time, Con Edison continued negotiations for increased pipeline capacity contracts created through incremental compression on existing pipelines (as opposed to new pipeline infrastructure). However, the expected in-service date for this capacity was November 2023. As a result, in order to maintain reliable service to existing firm gas customers, Con Edison announced in January 2019 a temporary moratorium on new firm customers in most of Westchester County that would commence on March 15, 2019. The moratorium is expected to remain in place until additional natural gas capacity from an existing pipeline can come online in November 2023, at which point the moratorium would be lifted.[25]

- **National Grid in Downstate New York (Long Island, Brooklyn, Queens)**:
  In May 2019, National Grid imposed a moratorium on new customer gas hookups in its service territory due to concerns around long-term supply availability after delays in pipeline development. Following customer complaints and a Public Service Commission investigation regarding service denials, in November 2019, National Grid and New York State reached a Settlement agreement to lift the moratorium, fund a series of energy efficiency and customer-focused clean programs, develop a report to analyze long-term

[21] New York State, New Efficiency: New York, April 2018 https://www.nyserda.ny.gov/About/Publications/New-Efficiency#:~:text=By%20meeting%20this%202025%20energy,a%2040%25%20reduction%20by%202030.&text=The%20PSC%20action%20further%20requires,%2Dto%2Dmoderate%20income%20sector.

[22] New York State Public Service Commission. CASE 18-M-0084 - In the Matter of a Comprehensive Energy Efficiency Initiative. Order Adopting Accelerated Energy Efficiency Targets. December 13, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B330F932-3BB9-46FA-9223-0E8A408C1928}

[23] New York State Department of Public Service, Reforming the Energy Vision Initiative. May 2018. https://www3.dps.ny.gov/W/PSCWeb.nsf/All/CC4F2EFA3A23551585257DEA007DCFE2

[24] New York State Department of Public Service, REV – Demonstration Projects. November 2019 https://www3.dps.ny.gov/W/PSCWeb.nsf/All/B2D9D834B0D307C685257F3F006FF1D9?OpenDocument

[25] Con Edison, Natural Gas Capacity Expansion https://www.coned.com/en/save-money/convert-to-natural-gas/westchester-natural-gas-moratorium/natural-gas-capacity-expansion

supply options, and hold a series of public stakeholder forums.[26,27] National Grid's Natural Gas Long-Term Capacity Report[28] and Supplemental Report[29] detail design-day capacity constraints and analyze available options for meeting long-term demand.

3.3 Future Gas Planning Proceeding

In March 2020, the New York PSC opened a new proceeding to investigate gas planning procedures to improve transparency of gas planning and investments in New York State.[30] The proceeding responds to recent actions by certain local distribution companies (LDCs) to invoke moratoria on new service connections based on their assessment that supply constraints would prevent them from maintaining reliable service to all customers during every hour of the year in parts of their service territories. The Gas Planning Proceeding will address four interrelated issues:

- the identification of "vulnerable locations" where there is an expected/forecasted future imbalance in the supply of and demand for natural gas;
- reliance on peaking services to meet demand;
- management of moratoria conditions when such events are contemplated; and
- the design of a "modernized" gas system planning process.

Furthermore, the proceeding will consider the policy alignment of gas planning with state and local climate goals, including CLCPA goals discussed above. The PSC calls out the risks of not developing Policy-Aligned Gas Planning:[31]

> "Policy-Aligned Gas Planning: Recent developments have challenged conventional approaches to gas system planning. These developments include, but are not limited to, recent and current instances of supply/demand imbalance, the emergence of viable, less-traditional and increasingly cleaner alternative solutions for demand and supply, the controversy and uncertainty associated with major gas infrastructure decisions, and the CLCPA's establishment of state policy directions. All the while, continued investment in gas infrastructure has significant long-term financial implications for customers.
>
> The current approach to gas system planning poses risks of incomplete alignment with CLCPA, sub-optimal consideration of alternatives and timeframe, increased risk and cost to consumers, and unsatisfactory provision of service and solutions for those same consumers. To align with these policies and to recognize the emergence of potentially

[26] National Grid, "National Grid to Lift Natural Gas Moratorium Immediately for Customers in Brooklyn, Queens and Long Island." November 25, 2019. https://www.nationalgridus.com/News/2019/11/-National-Grid-to-Lift-Natural-Gas-Moratorium-Immediately-for-Customers-in-Brooklyn,-Queens-and-Long-Island/

[27] New York State Governor's Office, "Governor Cuomo and National Grid Announce Agreement to Lift Moratorium Immediately." November 25, 2019. https://www.governor.ny.gov/news/governor-cuomo-and-national-grid-announce-agreement-lift-moratorium-immediately

[28] National Grid. 2020. "Natural Gas Long-Term Capacity Report." February 24, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Report_February_24_2020.pdf

[29] National Grid. 2020. "Natural Gas Long-Term Capacity Supplemental Report." May 8, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Supplemental_Report_May_8_2020.pdf

[30] New York State Department of Public Service, Proceeding on Motion of the Commission in Regard to Gas Planning Procedures. Case 20-G-0131. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-G-0131&submit=Search

[31] New York State Public Service Commission. Order Instituting Proceeding. Case 20-G-0131. March 13, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2BE6F1CE-5F37-4A1A-A2C0-C01740962B3C}

> viable alternatives to gas infrastructure, gas planning must explicitly take account of the likely useful life of all alternatives, and of the resulting cost and risk implications."

The NY PSC outlined the following issues to be addressed within the original Order Instituting Proceeding on March 19, 2020:[32]

1. Locational constraint analysis
2. Transparent and comprehensive utility planning information, including transparent gas planning, policy-aligned gas planning, and transparency regarding affiliate relationships for pipeline supply
3. Non-pipe solutions
4. Criteria for reliance on peaking services
5. Standards governing moratoria, including declarations of moratoria, treatment of applicants and customers, communications standards and practices, prioritization, and lifting of moratoria
6. Demand response and rate design
7. Criteria pollutant reduction
8. Tariff and rule revision.

In response, the joint natural gas utilities, or Joint LDCs, in New York, including Con Edison, National Grid, Central Hudson Gas & Electric Corporation, National Fuel Gas Distribution Corporation, New York State Electric & Gas Corporation, Rochester Gas and Electric Corporation[33] prepared "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management", stating[34]:

> "The Joint LDCs endorse the effort to modernize the gas system planning process in a way that considers supply-side, demand-side, and distribution solutions to meet customer demand. With respect to demand-side options, the Joint LDCs recognize electrification, energy efficiency, interruptible service, and non-pipeline alternatives (NPAs) as resource options. Among the supply-side options, the Joint LDCs emphasize that it is appropriate to consider the potential for renewable natural gas (RNG) and power-to-gas (PtG) solutions to contribute to deep decarbonization pathways that include low- and zero-carbon gas networks complementing electrification."
>
> "The Joint LDCs support a transparent long-term gas system planning process that objectively evaluates the potential costs, environmental impacts, and timing of implementation of all solutions and believe that this approach is superior to a process that preemptively eliminates or mandates options before performing comparative analyses to inform resource decisions."

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[32] New York State Public Service Commission. Order Instituting Proceeding. Case 20-G-0131. March 13, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2BE6F1CE-5F37-4A1A-A2C0-C01740962B3C}

[33] The Joint LDCs did not include smaller gas LDCs including St Lawrence Gas Company and Corning Natural Gas Corporation in upstate New York State. These utilities did not identify any supply or capacity issues in their filings.

[34] New York Joint LDCs. "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management." Case 20-G-0131. July 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A66EE1E3-A429-4A0F-9D64-C5D0101BCF42}

Within this filing, the Joint LDCs each has provided recommendations to be considered by the PSC and stakeholders and each utility has filed detailed reports outlining:

- Supply and Demand Analysis, including Assessment for Vulnerable Areas of the Service Territory
- Status and Proposals for Supply-Side and Demand-Side Reducing Solutions (described in detail in Section 4.0 and Appendix C).

Under this proceeding, DPS staff will review the provided materials and prepare a report to the proceeding that outlines a proposal to modernize gas system planning. On October 16th, PSC granted DPS an extension to file the report by November 16th.[35]

Section 4.0 and 7.0 describe how Con Edison operated a gas DR program with only a portion of participating customers with advanced metering infrastructure (AMI), and lessons learned around how AMI supports gas IRP, respectively.

4.0 Detailed Description of Con Edison's Smart Solutions Program and Similar Programs in New York State

This section provides a detailed description of natural gas DR, non-pipeline solutions, and other related programs proposed by natural gas utilities in New York State, including Con Edison, National Grid, and others, including those referenced above. The analysis focuses on the Con Edison CECONY and National Grid KEDNY/KEDLI operating areas, which have the most experience with these topics, but also includes details on current and future IRP activities by other New York State natural gas utilities. Appendix D provides service territory maps for Con Edison and National Grid.

In each case, the utilities initiated the development of the Gas IRP pilots and programs on an ad hoc basis in response to an urgent need to alleviate peak day capacity constraints, both today and in the near future. As detailed below, the utilities prepared funding requests, implementation plans, and other materials and submitted to the New York State (NYS) PSC for approval. This characterization includes analysis of the original petition, subsequent regulatory developments, and experience to date implementing the proposed solutions in these programs, where applicable. Described in greater detail below, most of these programs are in pilot phases, early years of deployment, or proposed ideas for future consideration. We present the descriptions in the following order:

- Primary New York State Gas Utilities for IRP Review
    - Con Edison
    - National Grid
- Other New York State Gas Utilities for IRP Review (Appendix C)
    - Orange & Rockland Utilities (O&R)
    - Central Hudson Electric & Gas
    - National Fuel Gas Distribution Company (NFGD)
    - New York State Electric & Gas (NYSEG)

[35] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

4.1 Con Edison Smart Solutions Program

Con Edison provides electric and natural gas service to 1.1 million customers in New York City and Westchester county. Con Edison has seen significant peak day demand increases within its service territory, driven by both population and economic growth in the service territory, but also by policy efforts to convert fuel oil heating customers to natural gas. Today, Con Edison relies on delivered services for 17% of peak day capacity, and rising to 22% by 2023. Delivered services are products offered by third parties that have firm contractual rights to pipeline capacity and who are willing to sell the capacity, bundled with natural gas commodity, for short durations (15 or 30 days). While delivered services are highly reliable when contracted, delivered services typically do not include long term renewal options, which creates long-term uncertainty of the availability for future years. Without additional ability to construct new pipeline capacity, Con Edison prepared a series of solutions to address these challenges. These solutions are proposed within the overall state and local GHG context described above.

To address the increased demand and limited capacity, Con Edison developed the Smart Solutions for Natural Gas Customers Program (Smart Solutions Program), an innovative, integrated, multi-solution strategy to decrease gas usage and procure alternative resources.[36] Con Edison submitted its proposal to the PSC in September 2017, and it was approved in July 2018, with different programs beginning in 2018. The Smart Solutions Program includes four non-traditional solutions:

- **Increased Energy Efficiency Spending** - A doubling of Con Edison's existing gas energy efficiency program:
- **Gas Demand Response** - A gas DR program to reduce net customer demand during the entirety of a peak gas demand day(s);
- **Gas Innovation Program** - A gas innovation program for renewable alternatives to natural gas heating, including air-source and ground-source heat pump systems; and
- **Non-Pipeline Solutions Solicitation** - A market solicitation for additional non-pipeline solutions on either the supply or demand side, which will provide pathways for the advancement of new technologies and facilitate new abilities to engage with and deliver services to customers; examples could include beneficial electrification of heating, biogas and other local supply-side solutions, increased energy efficiency and DR, or localized natural gas storage alternatives.

In developing the Smart Solutions Program solutions, Con Edison developed a Benefit Cost Analysis Handbook for Non-Pipeline Solutions (NPS BCA Handbook, final September 28, 2018; Draft March 1, 2018) to assist in the evaluation of demand-side reductions and/or non-traditional local supply-side additions as cost-effective alternatives to traditional interstate pipeline and distribution system expansions.[37] This NPS BCA Handbook was modelled after the NWA BCA Handbook that was developed through a statewide collaborative process to evaluate non-wires solutions and other electricity demand-side measures as alternatives to traditional electrical grid

[36] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

[37] Con Edison. "Interim Benefit Cost Analysis Handbook for Non-Pipeline Solutions." Case 17-G-0606. September 28, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={812C5EFA-FA1F-43D8-BC2A-83B542EC70EF}

infrastructure investments. Con Edison included an updated version of the BCA Handbook in the September 15, 2020 NPA Framework proposal filing.

The NPS BCA Handbook (Handbook) presents applicable BCA methodologies and describes how to calculate individual benefits and costs for NPS projects as well as how to apply the necessary cost-effectiveness tests for performing a complete BCA for NPS projects. The Handbook provides several generic BCA examples for non-pipeline solutions such as RNG, local gas storage, including CNG and LNG, environmentally advantageous fuel switching, and DR.[38]

Table 1 highlights the key benefits and costs for NPS projects identified in the original BCS Handbook and Table 2 highlights those within the September 2020 update. The 2020 BCA updates are generally consistent with the original list of benefits and cost categories and reflect further specificity of the NPS opportunities and proposed framework (e.g., addition of shareholder incentives / earnings adjustment mechanisms [EAMs]). Definitions and equations for each benefit and cost are provided along with key parameters, although the numerical inputs and cost-effectiveness thresholds are non-public, and will vary substantially by project. External benefits such as avoided or incremental carbon dioxide (CO_2) and other emissions are quantified if possible, and may be qualitatively assessed if they are not readily quantifiable.

Table 1. Summary of NPS Related Benefits and Costs from Original Con Edison BCA Handbook[39]

NPS Benefit Categories	NPS Cost Categories
Fixed and Variable Avoided Upstream Supply	Program Administration
Avoided Distribution Expense	Incremental Distribution
Reliability / Resiliency	Lost Utility Revenue
External Benefits	Participant NPS Cost
	Alternative Fuel Cost (e.g., Electricity)
	External Costs

[38] It is Guidehouse's understanding that while the PSC allowed the Smart Solutions Program to move forward under the proposed NPS BCA framework, the PSC declined to rule specifically on the proposed BCA modifications.

[39] Con Edison. "Interim Benefit Cost Analysis Handbook for Non-Pipeline Solutions." Case 17-G-0606. September 28, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={812C5EFA-FA1F-43D8-BC2A-83B542EC70EF}

Table 2. Summary of NPS Related Benefits and Costs from Revised Con Edison BCA Handbook[40]

NPS Benefit Categories	NPS Cost Categories
Avoided Peaking Services	Program Administration
Avoided Pipeline and Storage Capacity Costs	Incremental On-System Capacity Expenses
Avoided Commodity Costs	Lost Utility Revenue
Avoided On-System Capacity Expense	Shareholder Incentives
Reliability / Resiliency	Incremental Participant NPS Cost
External Benefits (e.g., Avoided CO_2 and Other Emissions, Land and Water Impacts)	Alternative Fuel Cost (e.g., Electricity)
	External Costs (e.g., Alternative Fuel CO_2 and Other Emissions, Land and Water Impacts)

Following PSC approval of the overall Smart Solutions Program, Con Edison prepared implementation plans or other materials to launch or advance each solution area:

- **Increased Energy Efficiency Spending:** The PSC approved Con Edison's proposal to increase energy efficiency spending and operate the program as a single comprehensive portfolio (gas energy efficiency and peak day savings goals) operating under the guidelines and procedures established for the existing energy efficiency program. The PSC granted Con Edison flexibility to adjust incentive levels by location and change program parameters as needed throughout program delivery without having to request PSC approval each time. The PSC did not increase the budget by the full amount requested by Con Edison, and approved the following increases in key metrics, including changes to gross savings targets:[41]
    - Annual program budgets from $14.5 million to $20.3 million per year (yr.),
    - Annual savings goals from 275,000 net MMBtu/yr. (Dth/yr.) to 606,924 gross MMBtu/yr. (Dth/yr.),
    - Peak day savings goals from 2,100 net MMBtu/day (Dth/day) to 5,000 gross MMBtu/day (Dth/day.);

This annual gross savings goal would represent approximately 0.7% of 2019 full service firm sales.[42] As a point of comparison, Enbridge Gas's 2019 Gas DSM Annual report estimates annual gross savings between 0.5% and 0.8% over 2014-2018 for EGD Rate Zone and 1.2%

[40] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

[41] New York Public Service Commission. "Order Approving in Part, with Modification, and Denying in Part Smart Solutions Program." Case." Case 17-G-0606. July 12, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4AA81E30-D21E-4F34-BA06-9E909EB1143C}

[42] Con Edison. "2019 Annual Report." Corporate Annual Report. https://investor.conedison.com/static-files/3b97b264-e5de-4ac3-95a4-57b19a9e0109

and 1.9% for Union Rate Zones.[43] Enbridge Gas had a total annual EE/DSM budget for 2019 of $129.7 million Canadian dollars (CAD), with $66.4 million CAD for the Enbridge Gas Distribution Rate Zone and $63.3 million CAD for Union Rate Zone.

- **Gas Demand Response**: Con Edison submitted the final implementation plan for approval by PSC on September 10, 2018. Con Edison provided an annual report describing participation, impacts, and lessons learned after the first two heating seasons (2018/2019, 2019/2020). In addition, Con Edison filed updated implementation plans in 2019 and 2020 incorporating the lessons learned from the prior heating season, as outlined in the annual report.[44]
- **Gas Innovation Program:** Con Edison submitted the implementation plan for approval by PSC on December 20, 2018[45] and subsequently filed a letter on September 10, 2019 withdrawing the original request.[46] Con Edison still believed in the potential for this type of program but wanted to propose these solutions as NY REV Demonstration Projects to test these business models further before committing to a full program.[47]
- **Non-Pipeline Solutions Solicitation:** Con Edison did not submit a detailed program design in its original filing, and instead outlined a plan to issue a request for information to the market soliciting innovative demand-side and supply-side measures. Con Edison issued the Request for Information for this program area in January 2020 with a deadline of April 2020, and Con Edison is reviewing the submitted program ideas.[48]

As described above, the Smart Solutions program included a wide range of supply-side and demand-side solutions to address both near-term and long-term capacity constraints. The PSC granted Con Edison significant flexibility to design, operate, and change different programs to achieve the goals. This included deploying EE / DSM solutions across the service territory, targeted NPS strategies specific for Westchester County, or varying incentive levels by location depending on the criticality of the peak-day capacity issues in those zones. Given the limited track record of the various IRP solutions within the program, both Con Edison and the PSC recognized that the original implementation plans would need refinement once launched, and some programs would under and overperform. The flexibility allows Con Edison to adjust incentive levels, program parameters, and shift budgets to adapt to market conditions without the requirement to seek PSC approval for each change.

4.1.1 Con Edison NPA Framework Proposal

On September 15, 2020, Con Edison submitted a proposal to the NY PSC under its rate plan proceeding (19-G-0066) that outlined a potential framework for the utility to pursue non-pipes

[43] Enbridge Gas Inc. “DRAFT 2019 Demand Side Management Annual Report.” May 29, 2020. https://www.oeb.ca/sites/default/files/EGI-2019-Draft-DSM-Annual-Report-20200529.pdf

[44] New York Department of Public Service Case 17-G-0606 contains implementation plans and annual reports for each year. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=17-G-0606&submit=Search

[45] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

[46] Con Edison. “Letter Withdrawing Request for Approval of Gas Innovation Implementation Plan.” Case 17-G-0606. September 10, 2019. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={01D14E91-3A14-4657-B591-E27FE370E967}

[47] REV Demonstration Projects are described in Section 3.0

[48] Con Edison. “Non-Pipeline Solutions to Provide Peak Period Natural Gas System Relief.” January 31, 2020. https://www.coned.com/-/media/files/coned/documents/business-partners/business-opportunities/non-pipes/non-pipeline-solutions-to-provide-peak-period-natural-gas-system-relief-rfi.pdf?la=en

alternatives to defer or replace traditional infrastructure projects. The framework outlines the following elements:

1. Integrating NPA into natural gas planning processes;
2. Qualifying natural gas budget categories for NPA;
3. Developing suitability criteria for project selection and determining sourcing approaches;
4. Developing NPA portfolios;
5. Implementing a BCA Handbook;
6. Addressing cost recovery;
7. Receiving performance incentives; and
8. Reporting on NPA progress and lessons learned.[49]

We describe the key elements of the proposed framework within Section 5.0 due to their strong alignment with the Issues List. The proposed framework was developed with DPS staff and other stakeholders and builds on the experiences and lessons learned from Con Edison's Smart Solutions program, and includes updates to the original Smart Solutions BCA Handbook. As of this writing, the New York PSC has not commented on the proposal.

4.1.2 Con Edison AMI Business Plan

Con Edison is in the process of installing AMI for each customer's electricity and natural gas meter. New York Public Service Commission's 2016 Order Approving Advanced Metering Infrastructure Business Plan includes Con Edison's business case for the implementation of AMI across the utility's electric and natural gas service territory. IRP is not mentioned specifically in the document, but various benefits that overlap with the concept of IRP are mentioned in the business plan (e.g., reduces customer energy use, cost savings and avoided costs). Con Edison is both a natural gas and electric utility, and the plan includes implementing AMI across customer electric and gas meters. As such, the benefits and opportunities from AMI meters are described collectively for both electric and gas meters. Furthermore, there are likely cost efficiencies when replacing both electric and gas meters. The benefits highlighted in the plan have been grouped below by theme:

- **Environmental benefits:**
  - AMI reduces GHG emissions through voltage optimization
  - Reduces customer energy use
  - Decreased vehicle usage (e.g. meter reading)

[49] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

- **Customer benefits:**
    - Reduces meter readings
    - Enhanced service reliability
    - Cost savings and avoided costs
    - Increased customer control over energy usage
- **Operational benefits:**
    - Reduction of the frequency and duration of outages during emergency events.

4.1.3 Gas Demand Response Program within Smart Solutions Program

Con Edison has published a series of lessons learned in the annual reports for the Gas DR Pilot Programs that highlight the challenges of promoting non-traditional solutions. The three-year pilot program (winter 2018/2019 through winter 2020/2021) consists of two separate programs[50]:

- **Performance-Based Gas DR Pilot** primarily targeting commercial and industrial (C&I) gas customers and multi-family buildings with centralized heating systems. Participants pledge the expected gas consumption that could be avoided on a peak day, and receive incentives both on the reservation ($/therm-day per month) and performance ($/therm-day per event). In the initial years before gas AMI meters were widespread, Con Edison offered 4 methods of data collection: AMI (where available), building management system (BMS) interval data, volume corrector-stored data, interface management unit added to existing gas meters.
- **Direct Load Control (DLC) Gas DR Pilot** targeting Con Edison's residential gas customers that participate though a Bring-Your-Own-Thermostat program leveraging smart thermostats installed at customer homes. The program is operated by a service provider who operates a similar electric DR program, and participants are offered $85 if they are a new enrollee or $20 if they are already participating in the electric DR program.

Con Edison achieved enrollment of 38 C&I and 517 residential smart thermostats in the first year, and 309 C&I and 2,804 residential smart thermostats in the second year. Con Edison has only called a limited number of test or actual events over the course of the two years due to technical issues with residential smart thermostats in the first year and warmer than expected weather in the second year. Despite the low overall performance numbers, Con Edison has reported significant findings and lessons learned on the pilots which has enabled Con Edison to understand the capabilities and limitations of customers' response to Gas DR events as well as better understand program administration. The following list highlights key modifications based on the first two seasons of performance recommended through the annual reports and incorporated into the next year's implementation plans:[51]

[50] Con Edison. "Modified Gas Demand Response Pilot Implementation Plan." Case 17-G-0606. September 10, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={35803586-10C6-4AAD-97F5-29E8DB2B2FEC}

[51] Con Edison. "2019 Con Edison Gas DR Annual Report." July 1, 2019. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={168BE55E-62A7-456E-B874-5D53BB5F74DF} Con Edison. "2020 Con Edison Gas DR Annual Report." July 2, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7FA119BD-B04D-4378-95A3-BB26697815AC}

- Amend the methodology used to calculate the weather-adjusted customer baseline load (CBL) to directly account for differences in temperature that affect customers' gas consumption.
- Establish a minimum enrollment value of 10 therms, for customers using a volume corrector, to record interval meter data or to customers that are submitting interval meter data under the BMS option[52], but have volume correctors installed on their meter(s).
- Impose and enforce a one-year participation ban on any enrollee identified to have switched to fuel oil or liquid fuels during an event, starting with the 2019/20 Winter Capability Period.
- Update incentive values based on stakeholder feedback. Updates to the incentive zones reflect the geographically based benefits in the BCA methodology used in the Con Edison's recent Non-Pipelines Solutions Request for Information solicitation.
- Modify the enrollment deadlines for customers that require an AMI meter be installed in order to participate, as described in metering option 4 of the Pilot Guidelines. Customers that wish to participate via this metering option will need to enroll by September 1, 2020 for a November 1, 2020 start date and by October 1, 2020 for a December 1, 2020 start date.
- Remove the original target enrollment for the DLC Pilot of 1,000 participating customers and continue accepting new enrollments unless constrained by the approved budget.

Con Edison has maintained interruptible rate programs for industrial and electric generation customers (including combined heat and power systems) for many years before the development of the Smart Solutions programs. Interruptible rate schedules are commonly offered by gas utilities, where large C&I or electricity generation customers receive a preferential rate for non-firm or interruptible service. When necessary, the utility can temporarily curtail gas supply to interruptible customers to maintain system reliability during peak day events. In these situations, interruptible customers typically switch their operations to an alternative fuel, such as fuel oil, diesel, propane, or electricity, or reduce their operations that day.

Interruptible rate schedules can be considered a form of gas demand response and participating customers are highly valued by the gas utilities. Con Edison does not allow current interruptible customers to participate in the Smart Solutions programs to avoid situations where the customer could receive multiple incentives (e.g., preferential rate in interruptible program and gas DR incentive), and enacted a 12 month "waiting period" for former interruptible customers to discourage conversion from non-firm to firm service in order to participate in gas DR and other Smart Solutions programs.[53] Furthermore, Con Edison does not allow fuel switching to fossil fuels in the gas DR programs, which is a common feature for interruptible programs. It is Guidehouse's understanding that the number of interruptible customers has decreased over time in Con Edison territory and the utility does not want to see additional conversions to firm service.

[52] Large commercial customers could submit data from their building management system (BMS) and their interval meter to show participation in a demand response event.

[53] Con Edison. "Modified Gas Demand Response Pilot Implementation Plan." Case 17-G-0606. September 10, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={35803586-10C6-4AAD-97F5-29E8DB2B2FEC}

4.1.4 Renewable Natural Gas

Con Edison is continuing to explore the potential role of RNG to aid in meeting their future gas supply needs. Con Edison has established standardized interconnection and purchase terms for anaerobic digestion facilities and has received inquiries from potential RNG project developers.

4.2 National Grid Gas IRP Programs

National Grid provides natural gas in Downstate New York to 1.9 million customers throughout Brooklyn, Queens, Staten Island and Long Island.[54] Over the past 10 years, demand for gas in this Downstate New York region has increased by 2.4% per year, driven by 1.9% real economic growth per year, the addition of 32 million square feet per year of housing and non-residential building space, ~12,400 conversions to gas heat per year.[55]

To supplement traditional pipeline supply capacity, National Grid relies on a series of portable CNG injection sites as well as recent connections with two landfill gas sites (Fresh Kills Landfill, Staten Island and Newtown Creek, Brooklyn). National Grid will further evaluate nearby RNG opportunities as well as hydrogen and PtG technologies.[56]

To further evaluate supply-side and demand-side solutions, National Grid developed a series of programs and pilots to evaluate strategies to mitigate peak-day demand issues, including non-firm / interruptible rates, a series of gas DR pilots, and heating electrification initiatives targeting residential, light commercial, and larger C&I customers. The gas DR pilots include an hourly load shift program, behavioral and smart thermostat programs for residential and light commercial, as well as a performance-based C&I program. Heating electrification includes air-source and ground-source heat pump incentives to customers using fossil-fuel heating, as well as a pilot for utility-owned geothermal loops.

Through the February 2020 Long-Term Natural Gas Capacity Report[57], National Grid evaluated the supply/demand impacts, reliability, cost, environmental, safety, and community attributes for different solutions to meet supply constraints in its Downstate New York territory, including:

- **Large-Scale Infrastructure Options:** offshore LNG port, LNG import terminal, largescale pipeline project (NESE Project)
- **Distributed Infrastructure Options:** peak LNG facilities, LNG barges, and local transmission and compression system enhancements
- **Demand-Side / No Infrastructure Options:** incremental energy efficiency, DR, and electrification

[54] National Grid's KEDNY and KEDLI operating areas are gas-only, whereas the Niagara Mohawk operating area in Upstate New York is both gas and electric service.

[55] National Grid. 2020. "Natural Gas Long-Term Capacity Report." February 24, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Report_February_24_2020.pdf

[56] National Grid. "National Grid Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-013. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={0E60CAED-51A3-4B76-90ED-389E7FFD9CE5}

[57] National Grid. 2020. "Natural Gas Long-Term Capacity Report." February 24, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Report_February_24_2020.pdf

In the subsequent May 2020 Supplemental Report, National Grid updated the analysis based on stakeholder comments and suggestions and made final recommendations regarding possible solutions which included two options:[58]

- **Option A: Distributed Infrastructure** – LNG Vaporization and Iroquois Gas compression enhancements to existing infrastructure, combined with incremental energy efficiency and DR
- **Option B: NESE Pipeline** – large-scale pipeline project

Later in May 2020, the NESE Pipeline was denied key permits in New York State and the pipeline developer declined to refile, which removed Option B from consideration.[59]

It is anticipated that National Grid will be making a filing to the NY PSC in late 2020 or early 2021 with a proposal for the deployment of non-infrastructure options consistent with the recommendations of the Supplemental Report. National Grid has developed internal BCA tools modeled on the Con Edison NPS BCA Handbook described above to evaluate the cost-effectiveness of different NPA and traditional infrastructure investments.

4.2.1 Gas Demand Response

National Grid has developed two gas DR pilots and reported on impacts, key findings, and lessons learned in early 2020:

- **National Grid (Downstate)**[60]
    - A customer-centric voluntary DR program for commercial firm gas customers in downstate NY. This project was developed to test the concept of DR within the gas business and begin to determine the optimal ways to deploy DR to create value for both the system operator and customers.[61] Over the course of three winters, 17 facilities participated in the project, though the total population fluctuated and 16 participated at any given time. Since the project was focused on reducing load during the peak hour, all reduction data were displayed in terms of nominal dekatherm (Dth) per hour for the customer facilities. At its peak, the project was reducing demand by 241 Dth/hr. This hourly reduction would be indicative of a daily reduction of 4,820 Dth, which is 2.5% of the reduction produced by National Grid's non-firm customer curtailment programs.
        - Required capabilities were: Receive a signal, either via Wi-Fi or a cellular network; Interrupt the electrical controls for a piece of equipment; Record customer usage data in intervals no longer than five (5) minutes

[58] National Grid. 2020. "Natural Gas Long-Term Capacity Supplemental Report." May 8, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Supplemental_Report_May_8_2020.pdf

[59] Reuters. "New York denies PA-NY Williams Northeast Supply natgas pipe." May 15, 2020. https://www.reuters.com/article/us-natgas-williams-pipeline/new-york-denies-pa-ny-williams-northeast-supply-natgas-pipe-idUSKBN22R3FT

[60] National Grid: Gas Demand Response Rev Demonstration Project - Final Report (Filed in Cases 16-G-0058 and Case 16-G-0059) http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C1EC8F5E-B383-4664-989A-1BE90C33FDE5}

[61] Ibid, page 3. "Historically, non-firm rates, which involve customers switching to an alternate fuel during curtailments, have provided significant amounts of reduction during those curtailments. For KEDNY and KEDLI, approximately 2,500 customers reduce peak day demand by nearly 200,000 dekatherms. However, the number of customers utilizing this rate has been declining over the past ten years."

        - Optional capabilities were: Control multiple pieces of equipment; Store usage information in the event of communication interruption
        - National Grid's vendor installed DR monitoring and control equipment at customer sites. This provides National Grid the ability to monitor and control customer loads (in year 3, National Grid included a non-DLC feature). The demand response management system (DRMS) captured the data and then it was made available to the customers through a web interface. Data access made customers more engaged in the DR program, even if – in some cases – they were not controlling the load curtailment.
    - The project demonstrated that customers were willing, even eager, to participate in DR programs. The project revealed that access to usage data was a valuable resource for customers to engage in DR and other innovative programs. The project also provided initial data on how DR programs can be used to support areas of low pressure on the distribution system.
    - Additional lessons learned included: rapid access to data is critical, customer-sited systems will almost always require customization, and gas DR programs will be able to transition to a more standard clearing price approach in the future, which should improve equity of incentive payments while still minimizing the risk for upward cost pressure. Some customers are interested in innovative programs, whereas process customers were less interested. Gas DR programs can contribute to peak load management, but program design must align with operational targets.

- **Niagara Mohawk (Upstate)**[62]:
    - Voluntary pilot with 8 enrolled customers that required mandatory participation and incentives based on customer curtailment relative to CBL. The pilot is scheduled to run over two winters, through the winter of 2020/2021 and has a target enrollment of 130 Dth. A mild 2019/2020 winter led to calling a test event that yielded 143 Dth.
    - Lessons learned after one winter included on-site data calibrations are needed to avoid or reduce rework, along with earlier program marketing to allow enough time for each customer's internal approval process. A program change was made to allow non-firm customers to enroll to help meet enrollment targets; however, participation in all events will be required for all participants. Additionally, the utility will increase alignment with other National Grid programs that target similar customers to improve customer engagement.

[62] Niagara Mohawk Power Corporation D/B/A National Grid: Commercial Gas Demand Response Project – FY 2020 Report. Case 17-G-0239. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={832BC04A-BF45-4979-8A78-94724E7408BD}

5.0 Comparison of How IRP Elements are Addressed in Con Edison's Smart Solutions Program and Similar Programs in New York State, and in the Enbridge Gas IRP Proposal

This section provides a point-by-point description of each IRP issue in the final Issues List for EB-2020-0091[63], and a comparative analysis highlighting how and the degree to which each element in the Issues List has been addressed in the Enbridge Gas IRP Proposal and similar programs in New York State. As described in the previous section, most of the New York State programs are in pilot phases, early years of deployment, or proposed ideas for future consideration. We provide details, where available, from Con Edison, National Grid, or other New York State utilities.

Section 3.3 provides an overview of the ongoing Gas Planning proceeding by the NYS PSC, and the major issues to be addressed in that proceeding are repeated below.[64] The current Gas Planning proceeding may result in changes to the IRP processes in New York State. The major issues are:

1. Locational constraint analysis
2. Transparent and comprehensive utility planning information, including transparent gas planning, policy-aligned gas planning, and transparency regarding affiliate relationships for pipeline supply
3. Non-pipe solutions
4. Criteria for reliance on peaking services
5. Standards governing moratoria, including declarations of moratoria, treatment of applicants and customers, communications standards and practices, prioritization, and lifting of moratoria
6. Demand response and rate design
7. Criteria pollutant reduction
8. Tariff and rule revision.

Within this filing, each gas utility within New York State has complied with PSC direction to file detailed reports outlining:

- Supply and Demand Analysis, including Assessment for Vulnerable Areas of the Service Territory
- Status and Proposals for Supply-Side and Demand-Side Reducing Solutions.

These reports are critical first steps in establishing an IRP process for New York State, but it is unclear at this time what the final IRP process may become. More details will be available in the

[63] Ontario Energy Board. "DECISION ON ISSUES LIST AND PROCEDURAL ORDER NO. 2 EB-2020-0091". July 15,2020 http://www.rds.oeb.ca/HPECMWebDrawer/Record/681891/File/document

[64] New York State Public Service Commission. Order Instituting Proceeding. Case 20-G-0131. March 13, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2BE6F1CE-5F37-4A1A-A2C0-C01740962B3C}

DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[65]

5.1 Major Elements of the Enbridge Gas IRP Proposal

5.1.1 What is Integrated Resource Planning (IRP) and what should the comprehensive goals of IRP be?

Enbridge Gas Proposal:

In Enbridge Gas's Proposal, IRP is defined as a:

> "multi-faceted planning process that includes the identification, implementation, and evaluation of realistic natural gas supply-side and demand-side options (including the interplay of these options) to determine the solution that provides the best combination of cost and risk for our customers."[66]

Further, the Proposal states that IRP is designed to determine appropriate alternatives to reduce in-franchise natural gas peak period demand growth in order to avoid future distribution and/or transmission expansion and reinforcement projects.

Enbridge Gas indicated in its Additional Evidence that the goal for IRP is as follows:

> "consider facility and non-facility alternatives in tandem which address long-term system constraints/needs such that an optimized and economic solution is proposed to meet the identified constraint or need. Consistent with the Guiding Principle of Cost Effectiveness, given that the least cost option is a central driver for selection of either a facility or non-facility solution, the recommended solution should be a lesser cost for customers on-the-whole."

New York State Programs:

New York State does not have a strict definition for IRP, but the current Gas Planning Proceeding aims to develop a "a modernized gas planning process that is comprehensive, suited to forward-looking system and policy needs, designed to minimize total lifetime costs, and inclusive of stakeholders." This outcome is consistent with the IRP definition in the Enbridge Gas's IRP definition. Furthermore, Con Edison outlined the IRP-consistent goals in the original Smart Solutions filing as follows:[67]

> "the Program is designed to meet customers' heating needs cost-effectively, avoid a moratorium on new gas customer interconnections, and contribute to the achievement of State and local environmental goals."

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[65] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

[66] Enbridge Gas. "Integrated Resource Planning Proposal". November 01, 2011. http://www.rds.oeb.ca/HPECMWebDrawer/Record/675587/File/document

[67] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

In the recent NPA Framework document, Con Edison described the utility's proposed process to

> "identifying, developing, implementing, and recovering costs and establishing performance incentives for NPA projects that would defer or eliminate traditional natural gas distribution infrastructure projects."

Furthermore, Con Edison recognizes the potential conflicts with state environmental goals when continuing to support its natural gas customers through infrastructure projects. The utility sees the NPA Framework as a process to formalize evaluation of Gas IRP solutions:

> "The Company recognizes that even more work is needed to harmonize the currently necessary maintenance and safe and reliable operation of natural gas infrastructure with New York's low-emissions future. This filing proposes a Framework to guide the Company's efforts to pursue alternatives to traditional infrastructure projects on the natural gas distribution system."

5.1.2 What is the appropriate process and approach for incorporating IRP into Enbridge Gas's system planning process, including scope, timing, stakeholder consultation, approval process and evaluation?

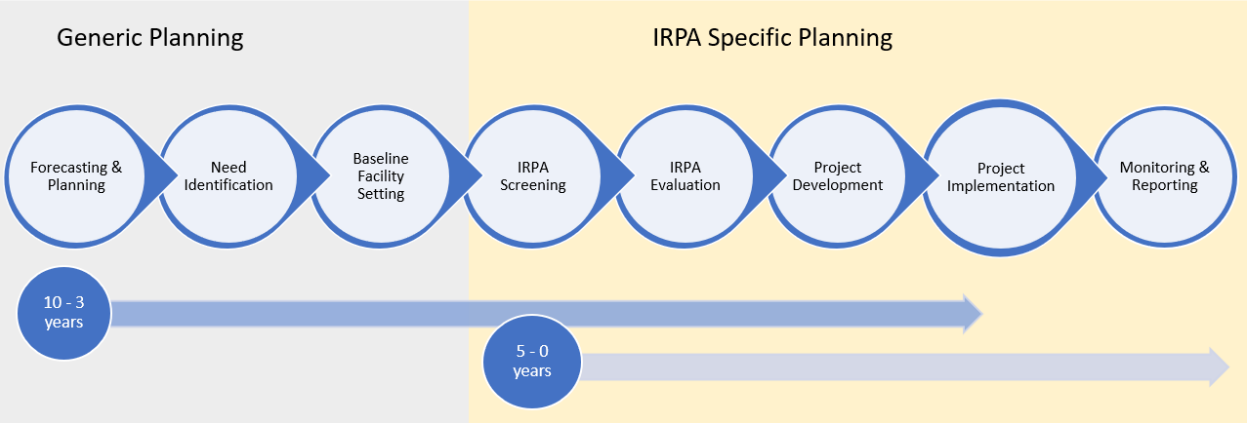
5.1.2.1 Scope and Timing

Enbridge Gas Proposal:

As discussed in Section 2.0, Enbridge Gas is currently required to carry out two distinct planning processes related to natural gas infrastructure: preparation and filing of an USP to be included in all cost of service rate applications and inform the calculation of Enbridge Gas's rate base, and Gas Supply Plans, which are detailed plans submitted by the utility every five years, with an annual update, and reviewed by the OEB, focusing on the reliability of gas service. Gas Supply Plans inform USPs, and both frameworks will be impacted by the implementation of Natural Gas IRP.

Enbridge Gas intends on integrating IRPA into its existing planning process. The utility intends to merge it with generic planning into a "fulsome Asset Management Plan" intended to meet forecasted demand from customers. Enbridge Gas has indicated that it will also consider IRPA to meet long term natural gas supply, per the Guiding Principles in Enbridge Gas's 5 Year Gas Supply Plan. Figure 1 highlights Enbridge Gas's proposed IRP integration into existing planning processes.

Figure 1. IRP Integration at Enbridge Gas



The first step in defining an appropriate process for IRP is to identify what type of system needs / proposed facility projects require any consideration of potential IRP alternatives. Enbridge Gas is proposing a binary screening for IRPAs. The following five characteristics are reasons why the utility may eliminate IRPA from consideration as an alternative to a proposed project:[68]

1. **Safety**: if a facility project to meet an identified need is determined to be essential to offer continued safe, reliable service and meet applicable law, then it will not be a candidate for IRP analysis
2. **Timing**: the threshold of three years before a system need must be met, anything less would preclude an IRPA
3. **Project-specific Considerations**: projects that align with other infrastructure developments may necessitate the installation of physical infrastructure
4. **Customer-specific Builds**: If the project is tied to a specific customer's need, which has either chosen to pay a Contribution in Aid of Construction (CIAC), or to enter into a long-term contract for firm delivery, then the project is not suitable for IRP analysis
5. **Community Expansion and Economic Development**: If a project is driven by policy and funding to explicitly deliver natural gas into communities to bring heating costs down, then it is not reasonable for IRP analysis

Projects that are eligible for IRP should be defined, and data is required to target the most impactful applications of IRP/ IRPA, which requires peak hourly data that is not currently available. In Enbridge Gas's IRP Proposal, the utility states:

> "The deployment of an AMI system, including ultrasonic meters, will allow for the collection of the hourly data that Enbridge Gas requires to not only target IRPAs effectively but also to monitor and verify their effectiveness to ensure that the IRPAs are

[68] Enbridge Gas. "Integrated Resource Planning Proposal – Additional Evidence". October 15, 2020. https://www.enbridgegas.com/-/media/Extranet-Pages/Regulatory-Filings/RateCases/Other-Regulatory-Proceedings/EB-2020-0091---Integrated-Resource-Planning-Proposal-IRP/Additional-Evidence/EGI_Additional_Evidence_20201015.ashx

performing as expected and to ensure peak period demand reductions are materializing."[69]

New York State Programs:
Within New York State, the gas utilities are working through how best to integrate non-pipeline-solution offerings with both small and large infrastructure planning projects. As of yet, there is no formal set of screening criteria. However, we observe empirically that the need to develop the programs and analyses to date was driven by a combination of:

- Pipeline expansion limitations
- Peak demand reduction need for finite conditions
- Strategic abandonment of leak prone pipe
- Need to avoid moratoria on connecting new customers
- Targeted customer conversions

The list below highlights the drivers for developing gas IRP solutions at New York State utilities:

- **Con Edison** – "The decision to consider the Smart Solutions Program expanded from the identified constraints caused by increased customer demand and limited capabilities to address increases in customer demand through traditional pipeline and other supply-side infrastructure. Con Edison focused the IRP solutions to Westchester county due to the urgent need to reduce demand on peak days."[70]
- **National Grid** – "National Grid welcomes the opportunity to engage DPS staff and other stakeholders as they continue to review the programmatic approach they are taking to continue to provide safe and reliable service at a reasonable cost to all natural gas customers. In particular, National Grid welcomes engagement about programs that are designed to address identified areas of supply/demand imbalance or to aid in the management of moratoria, including energy efficiency, demand management, and other measures."[71]
- **Central Hudson Gas & Electric** – The utility is currently implementing a subset of Non-Pipeline Alternatives known as Transportation Mode Alternatives (TMAs). TMAs are not designed to manage constraints, but instead to facilitate strategic abandonment of leak-prone pipe (LPP) that is not otherwise integral to the distribution system.[72]

Our interviews with Con Edison and National Grid highlight the need for greater coordination between NPS and gas planning/engineering departments to better integrate IRP planning in future decisions.

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[69] Enbridge Gas. "Integrated Resource Planning Proposal". November 01, 2011. http://www.rds.oeb.ca/HPECMWebDrawer/Record/675587/File/document

[70] Summarized from Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. "Report on Con Edison and O&R Demand Reducing Measures." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

[71] Summarized from National Grid. "National Grid Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

[72] Summarized from Central Hudson Gas and Electric. "Central Hudson's Demand Reducing Measures Status Report and Proposals." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6F5B0C7C-2D0F-48F9-8E65-0B8DBDDCFE90}

In the NPA Framework filing, Con Edison outlined the types of projects that could likely be considered for IRP solutions and those that could not use IRP solutions[73] as follows:

Likely Qualified for NPA Consideration

- **Load Relief**: Heating electrification, demand response, and energy efficiency measures could reduce overall demands in a specific area below the threshold needed to maintain reliability.
- **Regulator Station Upgrade**: Similar to above, heating electrification, demand response, and energy efficiency measures could reduce overall demands in a specific area below the threshold needed to maintain reliability.
- **Main Replacement Program**: If all customers served by the gas supply main voluntarily convert to alternatives, the main replacement project could be avoided. Con Edison notes that voluntary conversion and disconnection of all customers would present significant challenges.

Likely Not Qualified for NPA Consideration

- **Non-Distribution Infrastructure**: Investments such as information technology systems and AMI networks cannot be replaced by NPA.
- **Emergent Safety**: Investments needed to address emergent safety risks are required by state and federal law to be performed quickly, and cannot be replaced by NPA.
- **Regulatory Requirement**: Near-term infrastructure upgrades needed to meet regulatory requirements cannot reasonably be replaced by an NPA due to the volume of work that is required to be completed in a short time frame. As the NPA program grows, future projects may be evaluated for possible replacement with an NPA.

Furthermore, Con Edison describes how areas in its service territory that would be more vulnerable to future supply disruptions would be prioritized for NPA consideration. The Smart Solutions program followed this approach by focusing market solicitations on Westchester County and providing different incentive levels for the gas DR programs based on customer location.

Within the NPA Framework document, Con Edison proposed the following process for NPA consideration, highlighted in Figure 2:[74]

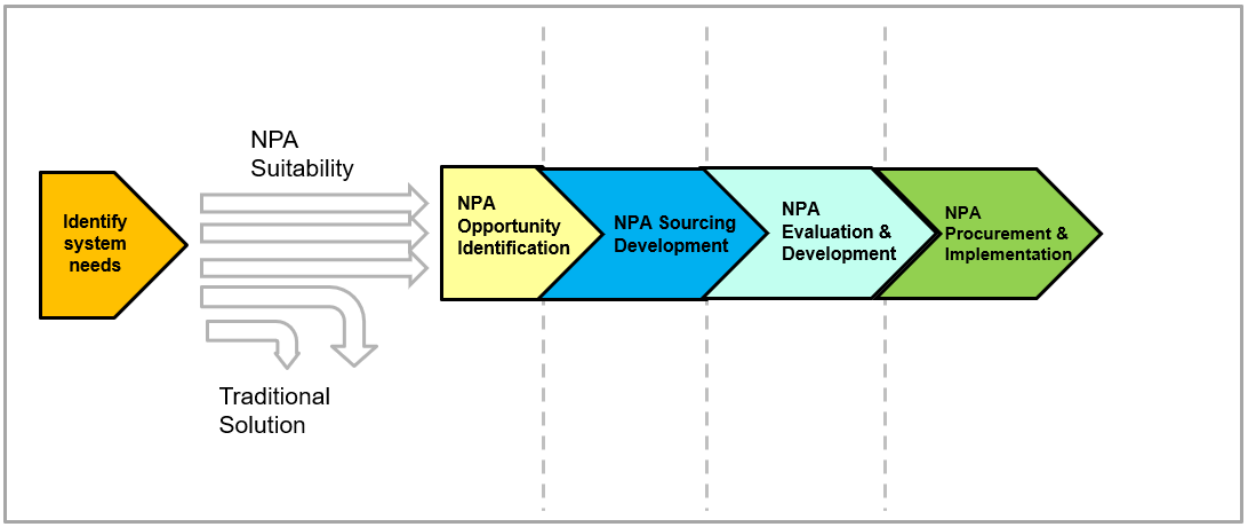
- Identifying Natural Gas Distribution System Needs
- Identifying Infrastructure Projects that can be Deferred or Replaced by Non-Traditional Alternatives
- Assessing NPA Suitability Criteria, such as size of relief needed, timeline, cost, geographic location, feasibility, and other factors

[73] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

[74] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

- Sourcing, Developing, Assessing, and Implementing NPAs, including evaluation considerations such as benefit-cost-analysis (BCA) and EM&V strategy

Figure 2. NPA Consideration Process from Con Edison NPA Framework



The proposal also highlights how timing is a key consideration for NPA consideration:

> "[Con Edison] proposes to integrate NPA into its natural gas planning process, including by beginning NPA work one or more years earlier than work on a traditional project is scheduled to begin. As infrastructure work is identified and planned, the NPA screening and suitability criteria defined below will determine which projects are a good fit for NPA.
>
> Understanding the timeline of system needs helps to identify the time by when the project needs to be implemented and operational, the lead time available to implement an alternative, and the amount of time [Con Edison] has to implement a traditional solution, if needed. Implementing alternative solutions takes longer than a traditional project because [Con Edison] must engage customers and the market, where applicable, and provide sufficient time for installation, verification and operation of alternative solutions."

Con Edison provides definitions for characterizing potential NPA projects as either large or small sized projects. These categories are not intended to be absolute definitions or restrict the consideration of NPA project. Rather, Con Edison proposes these characterizations to consider the types of NPA sourcing strategies to address the needs. Further discussed in Section 5.1.5, smaller projects can more likely be addressed through extension of existing programs, whereas larger projects can more likely be addressed through market solicitations:

- Large Project: 36-60 month timeline, >$2M cost
- Small Project: >18 month timeline, <$2M cost

Within the Future Gas Planning proceeding, the Joint LDCs made the recommendation to file the long-term Gas System Resource Plans on an approximate three year cycle, with additional

winter preparedness plans filed annually to address immediate reliability issues.[75] The current Gas Planning Proceeding or PSC comments to the Con Edison NPA Framework proposal may formally address when to consider IRP for future projects in New York State

5.1.2.2 Stakeholder consultation

Enbridge Gas Proposal:
Enbridge Gas carries out multiple stakeholder activities, including through DSM efforts, but the utility recognizes that it requires IRP specific insights from stakeholders. In the utility's Additional Evidence for the IRP proposal, Enbridge Gas noted the following objectives for its IRP stakeholder process:

> "(i)ensure planned resources will meet Enbridge Gas's obligation to safely and reliably deliver firm contracted demands; (ii) gather ample geographically-specific information such that IRPAs can be adequately reviewed and monitored; (iii) help inform the development of new or enhanced energy efficiency programming; and (iv) broadly inform Enbridge Gas's long-term strategic planning."

To achieve these objectives, Enbridge Gas proposes a stakeholder engagement for IRP that consists of three components.

1. **Component 1**: *"Gather and analyze data and insight from ongoing stakeholder engagement initiatives. These ongoing stakeholder engagement initiatives may be modified to elicit any new information required to enable IRPA analysis;"*
2. **Component 2**: *"Discussion on IRP during Stakeholder Days;"*
3. **Component 3:** *IRPA project geographically-specific stakeholder engagement completed prior to filing a proposed IRPA with the OEB."*

The Enbridge Gas IRP Proposal itself is part of an active OEB hearing. The OEB's hearings provide opportunities for stakeholder participation. Multiple intervenors are currently participating in this hearing.

New York State Programs:
Most IRP type programs in New York State have stakeholder consultation through a dedicated proceeding, part of the proceeding for a rate case, or during the program design:

- **Con Edison** – the Smart Solutions Program proposal was published within a PSC docket for public review and comment. Individual programs have their own stakeholder consultation processes including:[76]
    - **Gas DR:** Con Edison prepared and validated program concept designs and worked with stakeholders to amend and perfect a conceptual design. This involved a series of stakeholder interviews, public forums, and feedback throughout the process. Con Edison files an updated program design and

[75] New York Joint LDCs. "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management." Case 20-G-0131. July 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A66EE1E3-A429-4A0F-9D64-C5D0101BCF42}

[76] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

implementation plan each year for public comment along with an annual report summarizing impacts and lessons learned from prior years.

  - **Gas Innovation**: Under the original proposal, Con Edison planned to solicit market participants to propose projects that would use innovative business models to speed adoption of clean thermal technologies by customers. Con Edison would then issue a solicitation requesting proposals addressing the goals of the Gas Innovation program, and would update the Commission after the solicitation is released. Described in Section 4.0, Con Edison submitted the implementation plan for approval by PSC on December 20, 2018 and subsequently filed a letter on September 10, 2019 withdrawing the original request.

- **National Grid** – Because the NY PSC proceeding that resulted in the Long Term Capacity Report originated with customer complaints about denial of service, it was designed to investigate the moratorium and how to address it. The settlement designed the resolution process to maximize public input. Per the terms of the moratorium settlement agreement, the Long Term Capacity Report was issued as a public document and public comment was received through a series of public meetings and by filed comments and documents on the PSC Matter website.[77] These comments were reviewed by National Grid and several themes raised by commenters were addressed in the Supplemental Report. For more traditional filings, the experience is for stakeholders to intervene and participate in PSC regulatory proceedings.
- **Future Gas Planning Proceeding** – Within the current NY PSC proceeding evaluating gas planning procedures across New York State (20-G-0131), interested stakeholders and the general public can file comments and documents within the official proceeding.[78]

5.1.3 What, if any, OEB approvals are required under the IRP Framework, including for IRP Plans?

Enbridge Gas Proposal:
Enbridge Gas has requested that the OEB determine that the policy direction set out within its IRP Proposal is reasonable and appropriate. The IRP Proposal would guide Enbridge Gas's assessment of IRPAs. Once an IRP/IRPA has been determined as a preferential alternative to a facility project following a thorough two-stage assessment process by Enbridge Gas. Enbridge Gas would apply to the OEB for approval to recover costs associated with the alternative. The primary factors for deeming an IRPA as preferable to a facility project include the IRPA's ability to meet peak day demand at lowest cost.

Enbridge Gas suggests that its submission for approval of costs from the OEB could be done through the traditional rate application or in a stand-alone application. This application would include the rationale for investment in IRPAs, the cost of the approach, the proposed allocation of costs and recovery methods, and reporting and monitoring expectations. Enbridge Gas will maintain an IRP governance process to identify and resolve flaws in the design/delivery of IRPAs.

[77] National Grid Long-Term Solutions Website https://ngridlongtermsolutions.com/

[78] New York State Public Service Commission. Case 20-G-0131. Proceeding on Motion of the Commission in Regard to Gas Planning Procedures.http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-g-0131&submit=Search

New York State Programs:
The PSC approves cost-recovery for NPS program and pilot budgets, but allows flexibility for the gas utilities to operate the programs to meet their goals:

- **Con Edison** – Submitted within PSC docket in Sept 2017 and approved in July 2018. The proposal was reviewed by commission staff and interested parties, who filed comments on key topics. Once the Smart Solutions Program was approved by PSC, Con Edison submitted annual implementation plans for commission approval as well as quarterly updates and annual EM&V reports.
- **National Grid** – Individual programs are approved by PSC under different formats including pilots and energy efficiency/DSM programs as part of the more formal rate cases

Within the proposed NPA Framework document, Con Edison requested formal approval from the NYS PSC on the overall NPA process and framework, even though this approval is not explicitly required for NPA development:[79]

> Con Edison respectfully requests New York State Public Service Commission ("Commission") approval of the specific proposed process (i.e., the Company will consult with Department of Public Service Staff ("DPS Staff") in the development of NPA and file such proposals with DPS Staff prior to implementing an NPA), and the Company's incentive proposal.
>
> Footnote to this sentence: "[Con Edison] notes that the elements of this Framework do not require Commission approval (e.g., integrating NPA into its gas planning processes and the BCA handbook) and clarifies that its request for approval is limited to the process established by the Framework."

Furthermore, Con Edison outlined a strategy within the NPA Framework document on how the utility would work with the NYS PSC to gain approval for individual NPA projects that would defer or replace traditional distribution infrastructure projects:

> "Once there is reasonable certainty of costs for an NPA project, the Company will file with the Secretary to the Commission:
>
> 1 an implementation and verification plan;
>
> 2 a portfolio of solutions to be implemented;
>
> 3 anticipated costs of NPA;
>
> 4 any costs of NPA projects that are incremental to Company's revenue requirement or will be displacing a project subject to the Capital Investment Reconciliation;
>
> 5 a customer outreach plan, if appropriate; and

[79] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

6 BCA results. Implementation plans shall be filed and updated annually."

The current Gas Planning proceeding may result in changes to the IRP processes in New York State. More details will be available in the DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[80]

5.1.4 Will the IRP Framework necessitate consequential changes to any other OEB policies, rules, or guidelines? If so, which policies, rules, or guidelines might be affected, and how should these changes be addressed?

Enbridge Gas Proposal:
The proposal mentions certain aspects of natural gas planning where the OEB's policies, rules or guidelines currently exist. Enbridge Gas's IRP proposal does not propose specific changes to these policies, rules or guidelines, but Guidehouse believes that these may potentially be impacted by the implementation of an IRP framework.

- **Natural Gas Facilities Applications Guidance and Filing Requirements** - Leave to Construct is granted for traditional facility projects. Guidehouse believes that the set of guidelines will need to incorporate the existence of IRPA as an alternative to facility expansions.
- **DSM Frameworks** – "It is the OEB's expectation that the DSM framework consultation will monitor the IRP framework proceeding."[81] Enbridge Gas believes that it is important to keep a distinction between IRP activities and traditional DSM programming. As such, this proposal is intended to "address IRP planning and its full complement of IRPAs separately from DSM."[82]
- **Rate Applications** – Enbridge Gas indicated that applications for approval to recover costs of IRPAs may done through a traditional rate application.
- **Distributor Gas Supply Plans** – Enbridge Gas indicated that "When evaluating gas supply alternatives, Enbridge Gas balances its gas supply planning principles of reliability, flexibility, diversity and cost-effectiveness, against an alternative's ability to provide the requisite capacity".

New York State Programs:
The current Gas Planning proceeding may result in changes to the IRP processes in New York State. More details will be available in the DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[83]

[80] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

[81] Ontario Energy Board. "Post-2020 Natural Gas Demand Side Management Framework Board File Number: EB-2019-0003." December 19, 2019. http://www.rds.oeb.ca/HPECMWebDrawer/Record/663082/File/document

[82] Enbridge Gas. "Integrated Resource Planning Proposal". November 01, 2011. http://www.rds.oeb.ca/HPECMWebDrawer/Record/675587/File/document

[83] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

5.1.5 What are industry best practices for IRP, and how are they applicable to the Ontario context?

Enbridge Gas Proposal:
The Enbridge Gas Proposal discusses the ICF IRP Study, which included a jurisdictional scan of natural gas IRP.[84] The scan focused on using DSM and DR to reduce the need for traditional infrastructure investment. ICF included natural gas and electric utility experiences in its study. The major findings of the study are:

> "Based on a review of the state of the industry, there is no relevant precedent for, or evidence of natural gas utilities consideration of the impact of broad based DSM, geo-targeted DSM or dedicated DR programs impact on facilities planning. Further, while electric utilities have used DSM and DR programs to reduce the need for new generating capacity and transmission capacity for many years, there is only relatively limited experience deferring distribution system infrastructure."

ICF indicated in its report that natural gas IRP is in its early stages in North America. The report does not explicitly define or summarize best practices. However, the ICF report discusses a number of areas of concern related to practices that were typically lacking amongst the surveyed utilities. The list below summarizes ICF's identified areas of concern:

- Advanced Metering to capture peak reduction data
- Geo-targeted DSM programs
- Tracking and measurement of DSM program impact on peak hour or peak day demand
- Inclusion of peak day gas supply costs in avoided cost estimates
- Inclusion of avoided infrastructure investments costs in avoided cost estimates that is based on individual / specific infrastructure projects
- Allow a minimum 5 year lead time to incorporate geo-targeted DSM
- Identify a method of addressing universality issues, in that the same programs may not be able to be offered across the service territory.

New York State Programs:
Section 7.0 below details the key best practices from the natural gas IRP programs analyzed in New York State. The current Gas Planning proceeding may more formally adopt some of these practices to the IRP processes in New York State. More details will be available in the DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[85]

Most New York State gas utilities are dual fuel and have leveraged the designs, procedures, and lessons learned from the electric NWA pilot programs. Utilities have utilized NWAs, such as targeted energy efficiency, DR, distributed solar and gas-fired generation, battery storage, and grid technologies to defer traditional transmission and distribution projects and achieve lower

[84] Enbridge Gas. "DSM Mid-Term Review Submission of Enbridge Gas Distribution Inc." January 15, 2018. http://www.rds.oeb.ca/HPECMWebDrawer/Record/596649/File/document

[85] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

costs. Con Edison and National Grid each have developed NWA programs leveraging the existing delivery channels for energy efficiency and DR, with outreach or incentive enhancements depending on the program, as well as market solicitations to procure non-traditional energy efficiency programs or other NWA resources. Similar to Con Edison's funding request for the Smart Solutions program, the utilities requested additional NWA program funding to incorporate incremental EE/DR into their existing programs and also develop new programs covering distributed solar and gas-fired generation, battery storage, and other technologies. In the cases of EE/DR, the NWA programs adjusted incentive levels, measure offerings, and geographic scope to address the specific NWA needs, as highlighted in the example below.

Con Edison's Brooklyn Queens Demand Management (BQDM) Project[86] is a high-visibility NWA that successfully deferred an almost $1 billion US distribution upgrade in an approximately 800 MW load area.[87,88] In this project, Con Edison has deployed over 15 different NWA strategies including both grid-side and customer-side solutions, to reduce risks of underperformance of any one solution area. Con Edison developed NWA solicitations to procure a wide ranging and robust set of solutions from market actors. Con Edison also needed to devote significant resources to foundational elements like the original RFI/RFP documents, resource evaluation tools, marketing and outreach, and EM&V practices. The resource investments made for the BQDM project have been leveraged for other NWA projects as well as the development of the Smart Solutions programs.

Within the NPA Framework document, Con Edison described additional lessons learned from the NWA programs that are relevant for Gas IRP solutions: [89]

- "Larger projects that have greater load relief needs and/or are spread over a larger geographic area may take more time and effort to achieve the needed load reduction, but may also open up opportunities for soliciting innovative third-party solutions.
- Smaller projects with smaller load relief needs and/or spread over a smaller geographic area may be better suited to leveraging existing [utility] programs through providing additional incentives and targeted outreach.
- Existing programs currently in market have been proven to provide greater amounts of peak demand reduction more quickly than market solicitations. Existing programs may also be well-positioned to engage with specific customers, or to provide specific types of load relief. As a result, projects that require near-term load relief, or incremental load relief over a period of time may have a greater chance of success if existing programs are used, potentially alongside a market solicitation to address longer-term needs.
- [Con Edison's] experience in implementing alternative solutions both on the electric system and through its early efforts through its Smart Solutions for Natural Gas

[86] Con Edison. "Brooklyn Queens Demand Management Demand Response Program" https://www.coned.com/en/business-partners/business-opportunities/brooklyn-queens-demand-management-demand-response-program

[87] New York State Department of Public Service. Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program. Case 14-E-0302. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=45800

[88] AEE. "Brooklyn Queens Demand Management Program – Employing Innovative Non-Wire Alternatives." https://info.aee.net/hubfs/NY%20BQDM%20Final.pdf

[89] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

Customers program indicates the importance of maintaining a diversity of solutions and flexibility in implementing alternative portfolios."

A more detailed investigation of NWA programs and electric IRP is not within the scope of this research project. Appendix E contains a brief set of resources from New York State's Reforming the Energy Vision Docket (Matter Master Case 14-M-0101)[90] related to Distribution System Improvement Plans that perhaps would be valuable for the OEB or its staff to examine further, should it wish to do so. Given a cursory review, we believe that they may be instructive to the OEB in this case even in the absence of an integrated gas/electric utility.

5.1.6 What screening criteria and methodology should be adopted to evaluate and compare IRP Alternatives (IRPAs) with one another and with facility projects?

Enbridge Gas Proposal:

It is Guidehouse's understanding that this issue includes the question of what activities/projects (IRPAs) are eligible to be included within an IRP. The Enbridge Gas proposal suggests including a list of technologies that help address peak load, but may not fall within the current DSM framework. The proposed list is summarized below:[91]

1. **Gas Alternatives**
    a. **Natural gas air source heat pumps (NGASHPs)** *"NGASHPs will be effective at reducing peak day, peak hour and annual demands."*
    b. **Compressed Natural Gas (CNG)** *"CNG is considered a distribution IRPA and not a gas supply IRPA. Where system constraints/needs are identified, CNG can be injected into a targeted section of the pipeline system experiencing lower than optimal pressures to ensure adequate pipeline pressure control and the continued reliable delivery of natural gas."*
    c. **Renewable natural gas (RNG)** *"could be used in place of conventional natural gas for any CNG project, thus rendering the injection greenhouse gas emissions ("GHG") neutral."*
2. **Non-Gas Alternatives**
    a. *"Non-gas alternatives have no (or minimal) reliance on natural gas and instead would impact Ontario's electricity system."*
    b. **Electric Heat Pumps** *"electrically powered geothermal heat pump systems and electric air source heat pump. In certain situations where natural gas facilities are available, natural gas could be used to provide back-up functionality and resilience to these alternatives."*
    c. **District energy** *"District energy, also known as a thermal energy system, is designed to supply thermal energy (heating/cooling) to multiple buildings from a central plant or from several interconnected but distributed plants through*

[90] http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=14-m-0101

[91] Enbridge Gas. "Integrated Resource Planning Proposal – Additional Evidence". October 15, 2020. https://www.enbridgegas.com/-/media/Extranet-Pages/Regulatory-Filings/RateCases/Other-Regulatory-Proceedings/EB-2020-0091---Integrated-Resource-Planning-Proposal-IRP/Additional-Evidence/EGI_Additional_Evidence_20201015.ashx

harnessing and converting various forms of energy (such as natural gas, geothermal, photovoltaic cells, waste heat recovery) into useful thermal energy and distributing it to end-use customers (residential, commercial or industrial) through underground pipes."

d. **Power-to-Gas (PtG)** *"A power-to-gas ("PtG") plant may also be considered an IRPA. PtG is an effective technological solution that can connect natural gas and electrical infrastructure, enabling dispatchable sources such as solar and wind. The plant can be used to generate and store electrical energy as well as to provide grid stabilization services."*

3. **Demand Response (DR)**

   a. *"Demand Response ("DR") programs seek to adjust the demand for natural gas by influencing end-use consumption instead of adjusting facilities or gas supply. DR includes programs for residential, commercial and industrial customers which are designed to incent or oblige the customer to reduce or shift energy usage during peak periods."*

4. **Enhanced Targeted Energy Efficiency**

   a. *"Enhanced Targeted Energy Efficiency ("ETEE") is a means to address peak demand reductions in a particular geographic area and consists of supplementing existing traditional DSM programs (which target annual volume reductions and bill reductions) with additional spending, and/or designing and implementing new energy efficiency programs that are not part of the current DSM plan."*

5. **Gas Supply Alternatives**

   a. *"When planning to meet in-franchise customers' forecasted demands, Enbridge Gas will consider long-term natural gas supply IRPAs if they meet the Gas Supply Guiding Principles as outlined in Enbridge Gas's 5 Year Gas Supply Plan[92] As set out in its 5 Year Gas Supply Plan, commercial alternatives such as peaking supply, delivered supply, exchanges and third-party assignments are not considered appropriate to meet long-term gas supply requirements."*

Enbridge Gas proposes that IRPA screening be incorporated into its existing planning processes. Enbridge Gas maintains long term demand forecasts, which are used to determine future system constraints / needs. Once a need is identified, Enbridge Gas will identify a baseline facility, i.e. a traditional facility that can serve the need. The utility will then determine if the project is suitable for consideration of IRPAs, based on the screening criteria described in section 5.1.2. If suitable, the utility will consider any IRPA that could meet the capacity requirements of the system need. Such IRPAs would be identified and evaluated against the baseline facility in a two-stage process:

1. **First Stage** – The first stage is the identification of potential IRPAs and the testing of the reliability of the IRPA. The facility need and the potential for an IRPA to meet it will be analyzed based on input from the 2019 Integrated Ontario Electricity and Natural Gas Achievable Potential Study and other sets of data. This stage is intended to determine if the IRPA is a viable alternative to meet the identified need. Enbridge Gas notes that energy efficiency is limited relative to traditional projects, and as such the IRPA should

[92] EB-2019-0137, Enbridge Gas 5 Year Gas Supply Plan, May 1, 2019, pp. 5-6.

be able to meet 121% of the desired savings level. In Enbridge Gas's original IRP Proposal, it indicated that this first stage would also include a high-level review of the costs of the facility and of the IRPA(s).

2. **Second Stage** – the IRPA and the facility alternative will be compared on an economic basis using the Discounted Cash Flow (DCF) approach. Enbridge Gas also indicated in its proposal that it would evaluate the IRPA with more specific regional and technical information including: customer mix, contractor availability, characteristics of home and building stock, prior success of DSM and energy efficiency and conservation programs. This stage will also include a calculation of total project costs, revenue requirements and corresponding impacts on rates for both the facility project and the IRPA alternatives. In addition to cost, system reliability, alignment with public policy and safety are also expected to play a role in the evaluation.

Enbridge Gas proposes that the DCF approach be used to determine the economic feasibility for IRPAs. This is consistent with principles in the OEB's E.B.O. 134 and E.B.O. 188, and is used for leave to construct applications. A DCF analysis requires a forecast of all revenues, capital costs, overheads and operations and maintenance (O&M) costs, taxes associated with the project. The ultimate goal of the DCF is to achieve a net present value (NPV) of the project. If the project has an NPV of zero or greater, then it is considered economically feasible.

E.B.O. 134 includes DCF as the first of three stages in the assessment of a facility project. The other two stages are as follows:

- "The second stage should be designed to quantify other public interest factors not considered at stage one. All quantifiable other public interest information as to costs and benefits should be provided at this stage.
- The third stage should take into account all other relevant public interest factors plus the results from stage one and stage two."[93]

Enbridge Gas does not explicitly indicate whether it would adopt the second and third stages of the E.B.O. 134 methodology in its assessment of IRPAs.

New York State Programs:
The PSC and gas utilities in New York State have taken a broad approach to identifying and evaluating supply-side and demand-side solutions to support or defer traditional infrastructure projects:

Con Edison – the original Smart Solutions Program petition proposed a series of supply-side and demand-side solutions to supplement existing strategies. The Program includes four non-traditional solutions:[94]

- A doubling of Con Edison's existing gas energy efficiency program;

[93] OEB. E.B.O. 134 Report of the Board - Review by the Ontario Energy Board of the Expansion of the Natural Gas System in Ontario. June 1, 1987. https://www.oeb.ca/sites/default/files/EBO134-Board-Report-review-of-natural-gas-system-19870601.pdf

[94] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

- A gas DR program to reduce net customer demand during the entirety of a peak gas demand day(s);
- A gas innovation program for renewable alternatives to natural gas heating; and
- A market solicitation for additional non-pipeline solutions on either the supply or demand side, which will provide a pathway for the advancement of new technologies and facilitate new abilities to engage with and deliver services to customers; examples could include beneficial electrification of heating or localized natural gas storage alternatives.

Furthermore, within the Gas Planning proceeding, Con Edison outlined past, current, and potential future solutions including:[95]

- CNG trucking / injection,
- Biomethane and hydrogen low carbon gas resources blended into their supply,
- Energy efficiency, including weatherization, appliance, and controls measures targeting different customer sectors
- Demand response
- Heating electrification, including air-source, ground-source, and utility-owned geothermal loops
- Market solicitations for any of the above solutions or other solutions

Within the NPA Framework proposal, Con Edison outlined several key criteria when assessing NPA suitability compared to traditional infrastructure projects, including size of relief needed, timeline, cost, geographic location, and feasibility. As described in Section 5.1.2, the document highlights timeline and feasibility as a first screen of whether to consider a NPA process, with emergency replacement situations and non-infrastructure investments as those that are unlikely to be addressed through Gas IRP solutions. If a NPA project passes the first screen, Con Edison then proposed a set of evaluation considerations for possible NPA Measures, highlighted in Table 3.[96]

[95] Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. “Report on Con Edison and O&R Demand Reducing Measures.” Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

[96] Con Edison “Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure.” Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

Table 3. Evaluation Considerations for Potential NPA Measures from Con Edison Framework Proposal

Evaluation Consideration	Description
Cost Effectiveness	Total cost, incentive levels and impacts associated with incentivizing projects, as well as other costs to implement the programs, such as marketing
Execution Risk	The expected ease of project implementation within the timeframe required for the NPA (e.g., permitting, construction risks, and operating risks)
Coincidence with Peak	The extent to which the solution is expected to provide demand reduction during the peak day in the targeted area
Vendor Qualifications	The relevant experience and past success of solution providers implementing measures in the Company's service territory or other locations
Availability & Reliability	Ability of a solution or measure to reliably provide permanent or temporary load relief as required; technology maturity
State Policy / Community Impacts	Positive or negative impacts that measures may have on the community in the identified area (e.g., noise); alignment with state policy goals
Customer Acquisition	Ease of engaging customers to implement a particular solution, including a detailed plan and proof of customer relationships and level of commitment to implement NPAs are considered
Timeliness	Ability to meet the timeframe needed for demand reduction
Benefit Cost Analysis	Ability of a portfolio to deliver a positive benefit-cost analysis result using the Societal Cost Test (SCT) as defined through the Benefit Cost Analysis Handbook

Con Edison developed a BCA tool (detailed in Section 4.0) that is used to evaluate the costs and benefits of IRP solutions relative to traditional infrastructure costs.[97] The NPS BCA Handbook presents applicable BCA methodologies and describes how to calculate individual benefits and costs as well as how to apply the necessary cost-effectiveness tests for performing a complete BCA. The BCA Handbook also presents general BCA considerations and notable issues regarding project and investment benefits assessments. Definitions and equations for each benefit and cost are provided along with key parameters. Con Edison's September 15th, 2020 NPA Framework filing contains an updated version of this BCA Handbook. As described in Section 4.0, National Grid and other utilities have adapted Con Edison's methodology for evaluation of their own NPS programs and individual projects.

[97] It is Guidehouse's understanding that while the PSC allowed the Smart Solutions Program to move forward under the proposed NPS BCA framework, the PSC declined to rule specifically on the proposed BCA modifications.

National Grid – Through the Long-Term Natural Gas Capacity Report[98], National Grid evaluated the supply/demand impacts, reliability, cost, environmental, safety, and community attributes for different solutions. This evaluation relied on a relative comparison between infrastructure and non-infrastructure options to address long-term supply issues and did not have formal evaluation criteria as Enbridge Gas does, as described in Enbridge Gas's proposal above. Final comparisons of options were based on the NPV of costs, customer cost impacts, contributions to GHG targets and GHG mitigation value, and risk/reliability as measured by potential customer interruptions.

Figure 3 contains two presentations of summary information comparing options from the Supplemental Report.[99] We observe that National Grid's reports are motivated by the terms of the Settlement Agreement and intended to inform public discussion around the need for National Grid investment and rather than regulatory planning purposes. Many of these attributes presented are qualitative and would need to be developed further to form a regulatory basis.

[98] National Grid. 2020. "Natural Gas Long-Term Capacity Report." February 24, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Report_February_24_2020.pdf

[99] National Grid. 2020. "Natural Gas Long-Term Capacity Supplemental Report." May 8, 2020 https://millawesome.s3.amazonaws.com/Downstate_NY_Long-Term_Natural_Gas_Capacity_Supplemental_Report_May_8_2020.pdf

Figure 3. Comparative Tables of IRP Solutions within the 2020 National Grid Long-Term Natural Gas Capacity Report

Table 34: Updated Level of Attractiveness of Different Options to Close the Gap Between Downstate NY Gas Demand and Supply

● = highly attractive; ◕ = attractive; ◑ = neutral; ◔ = unattractive; ○ = highly unattractive

OPTION	SIZE (MDth/ day)	Level of Attractiveness				
		SAFETY	RELIABILITY	COST	ENVIRONMENT	COMMUNITY
Large-Scale Infrastructure Options						
Offshore LNG Port	400	◕	◕	◕	◔	◑
LNG Import Terminal	400	◕	◕	◔	◔	◔
Northeast Supply Enhancement (NESE) Project	400	◕	●	●/○*	◑	◕
Distributed Infrastructure Options						
Peak LNG Facility	100	◕	◕	◑	◑	◑
LNG Barges	100 (2 barges)	◕	◕	◕	◑	◑
Clove Lakes Transmission Loop Project	80	◕	●	◔	◑	◔
Gas Compression on the Iroquois Gas Transmission System	63	◕	●	●	◑	◕
LNG Vaporization	60	◕	◕	●	◑	◕
No Infrastructure Options						
Incremental Energy Efficiency**	Up to 168	●	◔****	◑	●	●
Incremental Demand Response***	Up to 104	◕	◔****	●	◕	◕
Incremental Electrification**	Up to 110	◕	◔****	◔	◕	◕

** Lowest cost in the High Demand scenario, but highest cost in the Low Demand scenario.*

***In excess of Local Law 97, 80-100% of NENY and Downstate NY electric utility electrification program targets, and 25-49% organic electrification of heat in retrofit buildings by 2035, all of which are assumed in Demand forecasts*

**** In excess of planned demand response programs that are assumed to reduce Demand by up to 53 MDth by 2035*

***** Reliability could improve over time as programs mature*

Table 35: Comparison of Two Recommended Solutions Against Evaluation Criteria

	Option A: Enhancements to Existing Infrastructure Combined with Incremental EE and DR	Option B: NESE Pipeline
Safety	• Strong safety records exist for all infrastructure proposed for enhancement, and all programs proposed for demand management	• Strong pipeline safety record; PHMSA would enforce all regulations for safe, reliable and environmentally sound operation
Reliability (certainty of meeting demand)	• Risk impact analysis does not identify any risk to new customer connections until 2027/28, or any risk resulting from a 2% supply disruption until 2025/26, providing ample time to address issues/put programs in place to mitigate these risks	• Has the highest degree of certainty that it will meet demand, with no risk of restrictions to customer connections, and no risk of customer shut-offs with a 2% supply disruption until at least 2032/33
Cost	• The second lowest customer cost impact under the High Demand scenario, and the lowest cost impact under the Low Demand scenario • Factoring in the cost of carbon, it is the second lowest total societal cost option under the High Demand scenario and the lowest cost option under the Low Demand scenario	• The lowest cost option under the High Demand scenario; lowest total $ cost and customer cost impact • Under the Low Demand scenario, it is the highest cost option • Factoring in the cost of carbon, it is the fourth lowest total societal cost solution under the High Demand scenario and the highest cost under the Low Demand scenario • Pipeline agreement is for 15 years, which eliminates concern about customers paying for stranded assets
Environmental Impact	• Infrastructure impact on the environment is minimal, as there is no new greenfield construction – it is enhancements to existing infrastructure. • Demand reduction through energy efficiency reduces emissions in the 2020-2035 time frame and accelerates pathway to achieving CLCPA goals	• Creates ecological impact from construction to the subsea environment • Has some beneficial environmental aspects in the near term (lower current marginal emissions vs. electrification, elimination of CNG trucking) • Longer term, supports GHG reduction from expansion of Renewable Natural Gas supplies, and is hydrogen-enabled to enable hydrogen blending/transport
Community Impact	• All planned infrastructure enhancements are within existing footprints/locations • Buildout of Energy Efficiency and Demand Response contractors could add jobs in Downstate NY	• Project is entirely offshore in NY, with minimal impact to community land/space • Some onshore construction in NJ on brownfield locations
Deliverability	• Involves multiple regulatory, permitting, customer behavior, and other external dependencies, including a number of infrastructure and non-infrastructure programs requiring regulatory approvals and funding to move forward, creating some implementation complexity that will need to be managed	• Has the lowest number of dependencies with regards to permitting, regulatory, and implementation considerations*

**Rates as "most deliverable" option assuming the project can obtain a water permit. This permit decision is, in effect, binary - if it is not obtained, then the project cannot move forward.*

Furthermore, within the Gas Planning proceeding, National Grid outlined past, current, and potential future solutions including:[100]

[100] National Grid. "National Grid Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

- CNG trucking / injection
- Biomethane and hydrogen low carbon gas resources blended into their supply
- Energy efficiency, including weatherization, appliance, and controls measures targeting different customer sectors
- Demand response
- Heating electrification, including air-source, ground-source, and utility-owned geothermal loops
- Market solicitations for any of the above solutions or other solutions (implied as part of NPA development process but not any specific solicitations as in the case of Con Edison).

Additional details on Gas IRP programs, pilots, and proposals are contained within Section 4.0 and Appendix C.

As described above, New York State has adopted significant GHG emissions reduction goals and decarbonization of fossil fuels figures to be part of the solution. Within its filing in the Gas Planning proceeding, Con Edison described how traditional supply-side solutions such as CNG trucks and injection facilities may not be a viable option due to the state's environmental goals, but low carbon fuel supplies such as biomethane or hydrogen could be eligible:[101]

> "In general, the Companies expect to limit the use of non-pipeline supply-side solutions in the future. Supply-side measures, other than RNG and hydrogen, are generally not aligned with long-term State and City climate change policy goals, face significant siting and permitting hurdles, and may be less reliable and more impactful to the environment than conventional gas pipeline infrastructure. Where necessary, such solutions will generally be employed temporarily to address supply-demand imbalances while more permanent solutions, such as demand-side measures, can be implemented."

Highlighted in Section 4.0 and Appendix C of our report, both Con Edison and O&R have developed interconnection standards and are exploring biomethane and hydrogen supplies regionally.

5.1.7 What is the appropriate approach to the recovery of the costs resulting from an approved IRP Plan and the costs for additional investments to support IRP?

Enbridge Gas Proposal:
Enbridge Gas suggests that IRPA investments be treated the same way as capital costs. Therefore, all costs associated with, planning, implementing, measuring and verifying IRPAs within the IRP process should be treated the same way as the capital costs of the facilities the IRPA avoids / defers. As a result, Enbridge Gas will include IRPA in its revenue requirement and be able to earn a rate of return on IRPAs.

[101] National Grid. "National Grid Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

Traditional facility investment costs are recovered through Cost of Service Applications that are developed by a natural gas utility and submitted to the OEB for approval. In these applications, the utility supports the calculation of its upcoming revenue requirement, which is then used to develop natural gas rates that are applied to customers. To calculate this revenue requirement, the natural gas utility must develop a gas throughput forecast and a customer forecast to identify the infrastructure required to meet future demand. This required infrastructure, along with the utility's existing infrastructure, make up the rate base of the utility. The revenue requirement is a dollar amount that reflects all of the associated capital, operations, maintenance and administration expenses and cost of capital parameters (e.g. return on equity for the utility) the utility will incur to serve its current and future customers. O&M costs, i.e. the ongoing costs of running the facility in good working order throughout its life, are not eligible to be capitalized and therefore Enbridge Gas cannot earn a rate of return on them. Enbridge Gas does propose that O&M costs for IRPAs be capitalized, which is a notable difference in the capitalization approach between O&M costs for IRPAs and facility projects. Enbridge Gas indicates that the overall intention of its IRPA treatment is to incentivize IRPAs and facility projects equally, but the cost treatment between the two will vary slightly.

Funding for Enbridge Gas's DSM programs is also approved by the OEB, but through a separate DSM Framework. Under the current framework, Enbridge Gas was required to submit an application for the delivery of conservation and energy efficiency programs between 2015 and 2020. The plan included details on each DSM program that would be provided including budgets, savings targets and shareholder incentives. The OEB reviewed the plan through a hearing, and allowed stakeholders to provided comments, and approved the plan on the basis of it being able to meet the OEB's guiding principles. These, at a high level, relate to fair and equitable delivery of long term DSM savings across all customers, in a manner that fairly compensates natural gas utilities, while minimizing rate impacts and integrating with natural gas planning and electricity conservation efforts. Approved costs incurred are recouped from customers through rates on a cost-recovery basis. In addition, Enbridge Gas is eligible for shareholder incentives based on the performance of its DSM programs in relation to the targets approved by the OEB, which are also recovered through rates.".

New York State Programs:

The original Con Edison Smart Solution filing provides details on the cost-recovery strategy for IRP solutions:[102]

> "Con Edison respectfully requests that the New York State Public Service Commission (the "Commission) approve the Program; allow for cost recovery for the various elements of the Program; allow incentives for the non-pipeline solutions; and provide budget flexibility among the various elements of the Program.
>
> Con Edison proposes that expenditures for the Enhanced Gas energy efficiency program, the Gas DR program, the Gas Innovation program, and the Non-Pipeline RFI be deferred as a regulatory asset (for non-traditional solutions), accrue interest at the weighted average cost of capital as set forth in its most recent gas rate case, and be

[102] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

> recovered over a ten-year schedule through the existing surcharge mechanism, the Monthly Rate Adjustment (MRA), until the next gas rate filing.
>
> At that time, Con Edison would seek cost recovery for unamortized expenses by rolling those expenses into base rates. Collecting these program costs over a ten-year period will lessen the immediate customer bill impact and better align the recovery of program costs with the delivery of benefits to customers. For capitalized utility sided solutions, Con Edison proposes to defer the carrying charges on those expenditures and also collect them through the MRA until base rates are reset."

The NYS PSC rejected Con Edison's proposed approach for the entire Smart Solutions and approved individual approaches for each program through subsequent filings:

- **Enhanced Gas EE Program** – "[Con Edison] is directed to directed to utilize unspent [Energy Efficiency Transition Implementation Plan] ETIP gas funds, and reallocate Energy Efficiency Portfolio Standard] EEPS gas funds…to support the combined ETIP and Enhanced Gas EE Program budgets.[103]
- **Gas DR Program** – "Con Edison is directed to recover annual Gas DR Pilot costs as-incurred through the [Monthly Rate Adjustment (MRA) delivery surcharge mechanism], similar to how the costs of the Company's electric Rider T are recovered."[104]
- **Non-Pipeline Solutions Portfolio** – "This Order authorizes additional funding, and establishes associated gross million British Thermal Units (MMBtu) savings targets, related to the Company's proposed demand-side initiatives, but defers the cost recovery of those programs to the pending rate proceeding and calls for further development and implementation of the NPA Portfolio in the existing processes currently in place; specifically, the Company's existing capital planning program."[105]

Con Edison's NPA Framework proposal includes a similar cost-recovery strategy to the original Smart Solutions, with an update from 10 years to 20 years for the amortization rate period.[106]

> "As provided in the Gas Rate Plan, the Company's costs for NPA implementation, including the overall pre-tax rate of return on such costs, will be recovered as a regulatory asset. The Company is proposing an amortization period of 20 years because this generally aligns with the projected useful life of the measures that are expected to be installed and appropriately spreads out costs for customers. A single amortization period for the NPA portfolio also provides administrative and accounting consistency and simplicity. The Company proposes recovery of NPA costs and any applicable incentives during this Gas Rate Plan through the Monthly Rate Adjustment (MRA). The Company

[103] New York Public Service Commission. "Order Approving in Part, with Modification, and Denying in Part Smart Solutions Program." Case." Case 17-G-0606. July 12, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4AA81E30-D21E-4F34-BA06-9E909EB1143C}

[104] New York Public Service Commission. "Order Approving With Modification Gas Demand Response Pilot." Case 17-G-0606 August 9, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4AA81E30-D21E-4F34-BA06-9E909EB1143C}

[105] New York Public Service Commission. Order Approving With Modification The Non-Pipeline Solutions Portfolio." Case 17-G-0606 February 7, 2019. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={64CE307C-4FD6-4043-8BE2-A5F04C5080E8}

[106] Con Edison "Proposal for Use of a Framework to Pursue Non-Pipeline Alternatives to Defer or Eliminate Capital Investment in Certain Traditional Natural Gas Distribution Infrastructure." Case 19-G-0066 September 15, 2020 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}

> shall file to incorporate unamortized NPA costs, including the return, into the Company's base rates when gas base delivery rates are next reset."

To date, NYS PSC has not responded to this cost-recovery strategy. The current Gas Planning proceeding may provide greater insight over the coming months.

5.1.8 Who should bear the risk of an IRP Plan that does not accomplish its planned expectations and should there be consequences for not achieving planned expectations?

Enbridge Gas Proposal:

There is limited precedence for Natural Gas IRP across North America, and the effectiveness of IRPAs in meeting supply requirements to reduce peak demand is unproven. The process for IRPAs require that ratepayer funds be invested before the IRPA can be proven to meet required reductions. Enbridge Gas indicates a number of requirements to ensure IRPAs function as planned, including implementation of AMI and annual monitoring and reporting. Enbridge Gas states that ratepayers should bear the costs of the successes or failures of IRPA due to the following reasons:

1. The OEB has encouraged Enbridge Gas to pursue the IRP as an alternative to traditional facilities
2. Enbridge is obligated to meet contractual peak period demand for customers
3. This treatment of risk is consistent with traditional facility projects
4. The OEB will have ample opportunity to review all IRPAs before any investment is made
5. Enbridge is committed to regular reporting on the effectiveness of IRPAs, and will seek approval from the OEB in advance of any investment in facility expansion/reinforcement projects.

New York State Programs:

Similar to the Enbridge Gas Proposal, there is risk with relying on unconventional approaches to address future system capacity needs. Enbridge Gas highlights cost risk, whereas New York State utilities have focused on supply risk. As highlighted in the original Con Edison Smart Solutions filing,[107]

> "[Con Edison] recognizes that major structural changes in the economy and electric and gas systems may be needed before Con Edison can rely on innovations, including renewable resources and adaptive customer response, to meet its customers' gas needs. As a result, if these non-traditional solutions do not provide sufficient capabilities, as a fifth solution, Con Edison is undertaking efforts to develop a traditional pipeline expansion project to meet a material portion of the projected customer demand."

[107] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

NY PSC ultimately rejected the 5th solution of traditional pipeline expansion, leaving questions on how Con Edison would address this situation.[108] Con Edison and National Grid have enacted moratoria on new customer connections in response to localized constraints (Con Edison in Westchester County, National Grid on Long Island). Should the proposed programs not meet their objectives, the utilities would likely pursue additional NPS strategies (e.g., greater customer electrification) and moratoria.

Our interview with National Grid highlighted the risk of making traditional infrastructure investments that may not be fully utilized in the future due to IRP solutions, as well as the risk of not making those infrastructure investments today and expecting IRP solutions to materialize in future years. Within the Joint LDC's letter within the Future Gas Planning proceeding, the group identifies two types of reliability when evaluating IRP resources:[109]

- "Deliverability Reliability relates to unplanned delivery interruptions and refers to the on-demand reliability of a resource (i.e., risk concerning whether the resource will be available and able to produce when called upon, especially during extreme cold conditions).
- Recontracting/Renewal Reliability refers to whether a particular contracted resource, or close substitute from another supplier, can be extended after the current contract term expires or whether, in the alternative, issues such as re-permitting challenges, regulatory changes, financial viability, and market conditions preclude the resource or close substitute from being included in the resource portfolio beyond the contract term."

As described in Section 4.1, peaking services or CNG trucking has higher deliverability reliability for the contracted period, but lower renewal reliability because the contracts may not be able to be called upon in future years. IRP solutions such as heating electrification that completely remove a customer's gas heating system from service would likely have higher reliability in both categories. Conversely, gas DR programs may have lower reliability in both categories since customers may underperform during peak events and would need to enroll each year.

To address these risks, the Joint LDCs proposed a framework to apply derating factors for supply-side and demand-side IRP solutions when determining the final capacity forecasts. The proposal provides some indicators for these derating factors, whereas others will need further refinement based on the current pilots:[110]

- **Supply-Side Resources:**
    - Interstate pipeline contract resources (firm transportation and storage with rollover): 100% (i.e., no derating), unless there are specific concerns for the resource, then 0-15% derating for deliverability and renewal reliability

[108] New York Public Service Commission. "Order Approving in Part, with Modification, and Denying in Part Smart Solutions Program." Case." Case 17-G-0606. July 12, 2018. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4AA81E30-D21E-4F34-BA06-9E909EB1143C}

[109] New York Joint LDCs. "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management." Case 20-G-0131. July 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A66EE1E3-A429-4A0F-9D64-C5D0101BCF42}

[110] New York Joint LDCs. "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management." Case 20-G-0131. July 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A66EE1E3-A429-4A0F-9D64-C5D0101BCF42}

  - On-system CNG and LNG storage: 0-25% derating for deliverability and renewal reliability
  - Delivered services (firm contracts for peaking capacity): 0-15% for deliverability reliability, 0-35% for renewal reliability
  - On-system CNG and LNG trucking supplies: 0-50% derating for deliverability and renewal reliability
- **Demand-Side Resources:**
  - Include energy efficiency, demand response, NPAs, and heating electrification (i.e., conversion of end-uses to electricity): to be determined based on further evaluation of pilots underway

How these risks are to be allocated to shareholders and ratepayers is still undetermined in New York State. The DPS whitepaper expected in October 2020 may provide greater guidance.

5.1.9 What incentives are appropriate to ensure effective IRP outcomes?

Enbridge Gas Proposal:

Enbridge Gas indicates in its Additional Evidence that incentivization of IRPA may not be needed to achieve the objective of providing an equal footing for both traditional capital investments and IRPAs. The proposal suggests that allowing Enbridge Gas to add IRPA and associated costs to rate base will achieve this goal without the need for further incentivization.

Enbridge Gas indicates that if the OEB wishes to incentivize IRPA, then the topic should be addressed in a separate study, e.g. through an upcoming annual rate setting proceeding.

New York State Programs:

In the original Smart Solutions filing Con Edison requested cost recovery for the various elements of the Program, including customer incentives for the non-pipeline solutions; and requested budget flexibility to operate the program. The cost recovery and program flexibility were approved by the PSC.[111]

Furthermore, the PSC has allowed Earnings Adjustment Mechanisms (EAMs) in Con Edison's electricity and natural gas energy efficiency programs. EAMs are a series of metrics that encouraged Con Edison to achieve certain energy efficiency, demand reduction, and electrification targets above required goals.[112] The PSC determines the number of EAMs the utility has achieved and adjusts the earnings that Con Edison is allowed, through its rate case. The PSC has not awarded EAMs for gas energy efficiency solutions under the Smart Solutions Program to avoid providing a "double incentive" in addition to previously agreed-upon EAMs that are tied to gas energy efficiency.

[111] Con Edison. Petition Of Consolidated Edison Company Of New York, Inc. For Approval Of The Smart Solutions For Natural Gas Customers Program. Case 17-G-0606. September 29, 2017. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}

[112] Con Edison. "Order Adopting Terms Of Joint Proposal And Establishing Electric And Gas Rate Plan." Case 19-G-0066. January 16, 2020. https://conedison.gcs-web.com/static-files/2163c1fa-d830-404d-9fa6-10f19beaf9f5

Con Edison also has EAMs within its NWA programs, detailed in Section 5.1.5[113], and proposed a similar set of EAMs within the NPA Framework filing:

> "In line with New York's treatment of NWS, [Con Edison] also proposes a performance incentive equivalent to 30 percent of the net benefits of a project, as determined by the BCA. [Con Edison] also proposes to maintain the general structure applicable to NWS with respect to the calculation of performance incentives as changes to specific programs occur, including savings sharing mechanisms, such that [Con Edison] is incented to reduce costs from forecasted amounts while an NPA project is in-flight.
>
> The key components of the incentive proposal are:
>
> 1 A performance incentive whereby customers retain 70 percent and [Con Edison] 30 percent of Initial Net Benefits as determined by the SCT performed prior to program implementation;
>
> 2 A cost-containment performance incentive that rewards [Con Edison] for reducing costs during NPA implementation with a cap equivalent to 50 percent of the Initial Net Benefits;
>
> 3 A provision to address a situation in which an NPA project is not able to defer or eliminate the traditional project as initially intended; and
>
> 4 Provisions for a change in timing or capacity needs for an active NPA project."

By agreeing to EAMs, the utility is incentivized to achieve higher levels of performance in areas of interest beyond simply meeting baseline performance expectations, and often to achieve greater cost-effectiveness than required. A more traditional rate-recovery strategy does not provide the utility specific areas of focus, such as performance targets, or additional incentive to go beyond minimum savings or cost-efficiency requirements. The incentive theoretically provides more upside earnings potential to the utility to stimulate its efforts in meeting the established target. The NPA Framework document as well as the other rate case filings provide greater detail on the EAMs calculation methodology. There are also considerations for how the incentives are affected if the NPA programs do not meet their intended objectives or if increased NPA programs are needed to meet revised objectives. EAMs themselves are not new, but it is still uncertain the long-term effectiveness of these programs, especially in achieving NWA and NPS goals in New York State.

5.1.10 What is the appropriate approach for monitoring and reporting on the progress of IRP Plans, including consideration of metrics and a scorecard?

Enbridge Gas Proposal:

In the IRP proposal, Enbridge Gas suggests that it will develop an annual IRP report that will provide annual and cumulative summaries of reductions in peak period demand. The report will also include expenditures made for the IRPA to date. Underperforming IRPAs will be identified

[113] Girouard, Coley. "BQDM program demonstrates benefits of non-traditional utility investments." March 11, 2019. https://www.utilitydive.com/news/bqdm-program-demonstrates-benefits-of-non-traditional-utility-investments/550110/

and resources will be allocated to other projects or IRPAs with the OEB's approval. Enbridge Gas suggests that its annual IRP Report be included in the annual Deferral and Variance Account Disposition and Earnings Sharing Mechanism applications. Table 4 below shows an example provided by Enbridge Gas of the monitoring and reporting template.

Table 4. Proposed Monitoring and Reporting Template

Program	Annual Natural Gas Demand Reduction (GJ/m3)			Cumulative Natural Gas Demand Reduction (GJ/m3)	Cost ($ million)			Cumulative Cost ($ million)
	Forecast	**Actual**	**Variance**		**Forecast**	**Actual**	**Variance**	
Sample	5,000	5,000	0	5,000	1.1	1.1	0	-

In addition to the data in Table 4, Enbridge Gas plans on reporting peak period demand in IRP locations to determine if the IRPAs have effectively reduced demand. If the IRPAs have insufficiently reduced demand, this report can be used to determine if facility projects are required in the future.

New York State Programs:

New York State utilities provide regular updates to the PSC for IRP-related pilots and programs through quarterly and annual reports filed publicly within the relevant proceeding. For example, Con Edison provides quarterly reports describing Smart Solution program expenditures, the extent to which expenditures have been recovered through customer surcharges, and major activities. Individual programs and pilots will have annual EM&V reports filed with the PSC detailing participation, impacts, budget, lessons learned, and other items. Con Edison also proposed annual filing of implementation plans for individual NPA projects, within the NPA Framework document. National Grid's Downstate DR pilot report indicates the following attributes of a successful gas DR program that were measured or estimated from demonstration results:

- Cost per "Unit" (defined as 500 cubic feet per hour of demand reduction)
- Total Demand Reduction per Customer
- Market Penetration
- Gross Demand Reduction Potential
- Potential for Capital Deferral
- Customer Satisfaction

6.0 Differences between Enbridge Gas and New York State Service Territories

This section summarizes key differences between the Enbridge Gas service territory and those of New York State gas utilities that may be relevant to IRP implementation and that should be taken into consideration in a comparative analysis (Table 5). Through the document review, Guidehouse identified the following key differences relating to Enbridge Gas and New York

State gas utility service territories. Guidehouse took these findings under consideration when developing the recommendations in Section 8.0.

Table 5. Comparison Between New York and Enbridge Gas Service Territories

Key Topic	New York State	Enbridge Gas
Utility Types	Both Con Edison and National Grid are combined natural gas and electric utilities, so IRP solutions such as electrification or policy shifts in New York State to encourage fuel switching from natural gas to electricity do not pose existential threats to the utility itself. Rather, the limitations on future gas infrastructure may create operational and financial uncertainty in one area of the business, whereas other areas of their business may benefit substantially in the long run. Many gas utilities in New York State are dual fuel, although several such as National Fuel Gas Distribution Company and St. Lawrence Gas are single fuel.	Enbridge Gas is currently a natural gas-only utility, although it is seeking confirmation that non-gas alternatives (including alternatives that use electricity, such as heat pumps) can be included in the range of possible and available IRPAs.
Gas Supply Issues	Delays and challenges in obtaining regulatory approval for new upstream pipeline capacity have caused near-term risks to utilities' ability to meet customer demand for natural gas, causing both Con Edison and National Grid to impose moratoria on new customer connections in parts of their service territories, driving efforts for IRP solutions.	Ontario does not currently face the same natural gas supply issues present in New York State.

Key Topic	New York State	Enbridge Gas
Environmental Goals	The GHG emissions goals and environmental landscape in New York State reduce the likelihood of regulatory approval for new pipeline capacity in the state. In response, Con Edison and National Grid have developed alternative strategies to address future capacity constraints through supply-side and demand-side resources. The utilities quickly developed these NPS programs to address urgent issues, which established the regulatory framework, operational practices, and statewide experience to propose, design, operate, and evaluate these new programs across New York State.	Ontario has established an Environment Plan targeted on reducing GHG emissions by 30% below 2005 levels by 2030.[114] This is an economy-wide approach, which identifies planned emission reductions from natural gas conservation and the use of renewable natural gas, but there have been no specific instructions for the OEB to direct the natural gas utilities to implement GHG reduction targets. The Ontario government has noted that the plan will continue to evolve with new information and actions. This policy has not yet resulted in a similar challenge for pipeline approvals, as seen in New York.
Experience with IRP Solutions	The utilities recognized this risk to future pipeline expansion to meet growing downstate demand and proactively pursued regulatory approval to develop pilots and programs. These utilities have historically used supply-side delivered solutions, interruptible rate customers, as well as local RNG resources to address peak day demand, and have expanded the opportunities to consider demand-side solutions such as enhanced EE, DR, and electrification.	Natural Gas DSM has long been implemented in Ontario, and there is a requirement for Enbridge Gas to consider DSM as an alternative to traditional supply in proceedings for infrastructure approvals. Enbridge Gas also has experience with interruptible rates.

[114] Government of Ontario. “A-Made-in-Ontario Environment Plan.” November 29, 2018. https://www.ontario.ca/page/made-in-ontario-environment-plan

Key Topic	New York State	Enbridge Gas
IRP Regulatory Activities	Con Edison and National Grid developed the new demand-side solutions programs under separate regulatory proceedings from the standard energy efficiency and gas planning filings and are designed to be separate and incremental to the regulatory-mandated energy efficiency programs. Furthermore, NYS PSC has begun the process to look at future gas planning needs in New York State in a recent proceeding and required other New York State gas utilities to examine their own long-term supply and demand vulnerabilities.	"It is the OEB's expectation that the DSM framework consultation will monitor the IRP framework proceeding."[115] Enbridge Gas has requested that DSM for IRP be considered through a separate regulatory process than the traditional DSM programming. In the second procedural order for the IRP proceeding, the OEB stated the following, "The OEB agrees that this proceeding is not the forum to duplicate matters being considered in other policy reviews, such as the Post-2020 DSM Framework for Natural Gas Distributors. However, it is in scope of this proceeding to consider how objectives for DSM, carbon abatement, asset optimization and other relevant OEB policies should be taken into consideration as part of IRP."

[115] Ontario Energy Board. "Post-2020 Natural Gas Demand Side Management Framework Board File Number: EB-2019-0003." December 19, 2019. http://www.rds.oeb.ca/HPECMWebDrawer/Record/663082/File/document

Key Topic	New York State	Enbridge Gas
Cost Recovery and BCA Approaches	The NPS programs were allowed cost recovery, designed with commission and stakeholder input, designed as flexible multi-year pilots to allow for lessons learned and changed before each heating season, and demonstrated to show cost effectiveness under new BCA handbooks for New York State. The NPS programs included utility-operated programs, including expansions of existing EE/DSM to target specific locations, as well as market solicitations for new ideas and program designs specifically developed for gas IRP needs.	Gas utilities are able to recover costs and lost revenues from DSM programs from ratepayers. DSM frameworks have been designed with stakeholder input, and are required to meet specific cost effectiveness tests.[116] The natural gas savings, and corresponding spending, are evaluated regularly by the regulator through an independent third party evaluator and reviewed by stakeholders. Ontario has explicit cost-effectiveness test requirements for DSM program screening (Total Resource Cost[117], Program Administrator Cost) as well as scorecard targets for program delivery performance, and for gas facility approvals (Profitability Index). Unlike New York, there is no specific manual for utilities to evaluate the benefits and costs specific to IRPA projects.
Lessons Learned from Pilots	To date, the New York State NPS pilots have provided the utilities interesting findings regarding the future potential of these types of programs and limitations with customer participation and impact. It is still uncertain the extent to which these types of NPS alternatives can mitigate future system capacity risks on peak days without going to more drastic measures such as a gas moratorium for new customers or forced electrification for existing customers. The utilities and PSC will learn more at the conclusion of these pilots.	Ontario does not have as strong of a history of natural gas DR programs and tendering for new ideas and program designs specifically developed for gas IRP needs as New York does. Enbridge Gas does not have an equivalent program to the Market Solicitation pathways within Con Edison's Smart Solutions Program.

[116] Ontario Energy Board. "Demand Side Management Framework for Natural Gas Distributors." April 10, 2014. https://www.oeb.ca/industry/policy-initiatives-and-consultations/demand-side-management-dsm-framework-natural-gas

[117] Some non-energy benefits are included in the Total Resource Cost calculation, through a 15% adder. The cost of carbon is also added in the calculation in addition to the 15% adder.
OEB. "Mid-Term Review of the Demand Side Management (DSM) Framework for Natural Gas Distributors (2015-2020). November 29, 2018. https://www.oeb.ca/sites/default/files/Report-of-the-Board-DSM-Mid-Term-Review-20181129.pdf

Key Topic	New York State	Enbridge Gas
Role of AMI	Con Edison is in the process of deploying AMI infrastructure across its service territory and has deployed IRP solutions in areas with and without AMI installed. Con Edison has indicated that performing demand-side IRP programs without such infrastructure is feasible but carries additional challenges and costs.	DSM measures have been determined, from a theoretical standpoint, to be effective at reducing peak hour demand sufficiently to reduce some infrastructure investments.[118] Enbridge Gas has determined that an AMI system deployed across the service territory will help enable IRP by providing granular peak demand data and allowing Enbridge Gas to focus on investments with the highest potential to reduce peak demand.[119]
Experiences with Electricity NWA Programs	Con Edison and National Grid each have developed NWA programs leveraging the existing delivery channels for energy efficiency and DR, with outreach or incentive enhancements depending on the program, as well as market solicitations to procure non-traditional energy efficiency programs or other NWA resources. Con Edison's BQDM Project[120] is a high-visibility NWA that successfully deferred an almost $1 billion US distribution upgrade in an approximately 800 MW load area.[121,122]	Electricity NWA programs been investigated in Ontario, with a localized NWA demonstration project currently being carried out in the York Region.[123]

[118] ICF. "Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment " January, 2018. http://www.rds.oeb.ca/HPECMWebDrawer/Record/596649/File/document

[119] Enbridge Gas. "Integrated Resource Planning Proposal". November 01, 2011. http://www.rds.oeb.ca/HPECMWebDrawer/Record/675587/File/document

[120] Con Edison. "Brooklyn Queens Demand Management Demand Response Program" https://www.coned.com/en/business-partners/business-opportunities/brooklyn-queens-demand-management-demand-response-program

[121] New York State Department of Public Service. Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program. Case 14-E-0302. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=45800

[122] AEE. "Brooklyn Queens Demand Management Program – Employing Innovative Non-Wire Alternatives." https://info.aee.net/hubfs/NY%20BQDM%20Final.pdf

[123] IESO. "IESO York Region Non Wires Alternatives Demonstration Project". http://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/IESO-York-Region-Non-Wires-Alternatives-Demonstration-Project

7.0 Industry Best Practices for Natural Gas IRP

This section summarizes the key characteristics and best practices from the natural gas IRP programs analyzed in this project, as well as lessons learned, and planned improvements identified by Con Edison and National Grid program managers regarding their own IRP experiences. Guidehouse took these findings under consideration when developing the recommendations in Section 8.0. Key characteristics and best practices identified are:

- Developing BCA procedures that evaluate infrastructure, supply-side, and demand-side solutions with a similar set of assumptions and recognize the risks associated with traditional vs. emerging options can allow for a more transparent IRP process.
- Utility program managers implementing demand-side IRP solutions require flexibility to adjust recruitment strategies, incentive amounts, budgets, operating procedures, and other parameters to achieve the goals of the programs.
- Non-traditional supply-side and demand-side solutions carry greater uncertainty compared to traditional infrastructure projects, and utility program managers have overcome these risks by oversubscribing customers and diversifying the IRP solutions. Traditional demand-side solutions such as energy efficiency or heating electrification have a higher degree of certainty of load reduction for each participant whereas DR carries greater uncertainty of demand reduction on peak days because it is dependent on customer behavior on those days. To address these issues, utilities deploy a broad mix of solutions, but are cognizant of and adjust for these different levels of certainty. The initial pilot programs being deployed now will provide greater insight into more standardized assumptions for reliability.
- Deploying a diversity of IRP solutions is important to reduce risks in achieving the project goals. Smaller IRP projects may be able to achieve goals in a shorter timeline by expanding existing EE/DSM or DR programs, whereas larger IRP projects may be best suited for market solicitations and new program developments that have longer timelines.
- EM&V of IRP initiatives is critical both to confirm demand reduction as well as to ensure customer compliance with program goals and requirements. For example, Con Edison performed EM&V within their Demand Response program to measure the 24-hour gas demand reduction on a peak day and verify that customers did not offset gas consumption with fuel oil, which contradicts the program's environmental goals. Through the Gas DR pilot programs, Con Edison found performing EM&V for demand-side IRP solutions is more challenging without gas AMI deployed across the service territory. There are opportunities to perform EM&V without AMI, but these carry higher costs per unit of peak day reduction (see section 4.1.3). As experience is gained and lessons are learned from EM&V, firmer conclusions and guidance can be developed about performance, cost effectiveness, and robustness of results.
- New York State utilities have found the operational processes, program design, benefit-cost analyses, and other parameters for the Gas IRP solutions can be similar to existing gas energy efficiency programs or electric NWA programs. The NWA pilots have suggested significant investment in organizational resources (e.g., dedicated time for cross-functional managers and experts, IT system development, internal training updates) is needed upfront to develop the necessary internal processes and operationalize the programs, but that can be useful across both gas and electric IRP solutions. Nevertheless, they have found key differences relating to limitations around

space heating end-uses, building codes, customers switching to fuel oil, and other issues that require separate set of guidelines. The level of investment necessary to operationalize IRP programs will vary based on the capacity, expertise, and experience of utility staff and their current programs, as well as experiences of neighboring utilities that share similar regulatory processes.

- IRP programs take significant time to develop, recruit, launch, and scale and may not align with the timelines of gas planning or engineering departments when looking at traditional infrastructure projects. Of note is that different IRP solutions have different lead times; for example, a DR program may have a shorter lead time than an electrification program. By taking these differences into account, utilities can use a mix of these IRP programs to reduce load before committing to more expensive infrastructure projects.
- Gas utilities recognize that core planning processes including gas supply and transportation planning, infrastructure maintenance and expansion planning, energy efficiency / demand-side management planning, and IRP planning are interconnected and interdependent. For this reason, gas utilities are seeking to identify how to integrate these processes and sequence the activities to ensure that each planning process properly captures the output of adjacent processes. Having regular discussion with regulator and stakeholder groups around the needs for capacity additions, IRP solutions, and program design plans can reduce uncertainty and facilitate success.
- Regulators need to design the proper incentives for utilities to pursue IRP solutions, including cost-recovery and sharing risk amongst stakeholders similar to a traditional infrastructure investment. EAMs have been successful in New York State in aligning the goals of the utilities, regulators, and key stakeholders, although their long-term effectiveness is still uncertain.

8.0 Key Findings and Recommendations

Guidehouse prepared this report summarizing key IRP activities in New York State to support The OEB's review of Enbridge Gas's IRP proposal in the regulatory proceeding EB-2020-0091. Based on a review of public materials and expert interviews, Guidehouse summarized key IRP activities for Con Edison, National Grid and other New York State utilities, prepared a side-by-side comparison with each of the IRP issues in the Issues List for the EB-2020-0091 proceeding, outlined key differences between the jurisdictions, detailed lessons learned from early IRP activities.

This section provides a summary of the key findings in the analysis as well as Guidehouse's recommendations to the OEB regarding the review of Enbridge Gas's IRP Proposal and implementation of natural gas IRP in Ontario.

8.1 Summary of Key Findings

The following list summarizes Guidehouse's key findings for the OEB to consider when reviewing Enbridge Gas's IRP proposal and evaluating opportunities to implement natural gas IRP in Ontario:

- New York State gas utilities and the PSC have developed a range of gas IRP solutions to address pipeline expansion limitations, peak demand reduction needs, the need to avoid moratoria on new customers, and other goals. The utilities developed the

regulatory framework and operational practices to execute the programs in a short period of time. These programs were developed in reaction to urgent issues affecting system reliability, particularly related to delayed and cancelled pipeline capacity projects and/or due to political and environmental pressures. The New York PSC and gas utilities are currently working towards a modernized gas planning framework that will consider supply-side, demand-side, and distribution solutions to meet customer demand while meeting statewide decarbonization goals. More details will be available in the DPS whitepaper expected by November 16th, 2020 as well as other filings over the coming months.[124]

- Enbridge Gas and the OEB have taken a proactive approach to develop a Gas IRP framework. Enbridge Gas's proposed goal is to develop a framework to guide Enbridge Gas's assessment of IRPAs relative to other facility and non-facility alternatives to serve the forecasted needs of Enbridge Gas customers . Ontario already has a framework for the deployment of natural gas DSM programs. Enbridge Gas's IRP Proposal includes a definition of eligible IRPAs, screening and selection criteria for IRPA vs. traditional facility projects, monitoring and reporting guidelines and other elements that attempt to solidify the IRP Framework as a standalone construct that is distinct from the DSM and facility project frameworks.
- Enbridge Gas proposes using a traditional DCF analysis to value IRPA in order to compare these on an equal footing with traditional infrastructure. This approach is defined in the OEB's guidance from proceeding E.B.O. 134, and the environment for cost benefit analysis has evolved significantly since this methodology was originally developed. Con Edison has developed a formal BCA handbook, which includes a detailed methodology for calculating all the benefits and costs of particular IRPAs as well as examples of different types of IRPAs, such as: demand response, renewable natural gas. The BCA captures all the costs and benefits and can facilitate a transparent discussion with stakeholders.
- Enbridge Gas has indicated that deploying an AMI system will help enable the IRP framework, as these meters can allow Enbridge Gas to collect hourly peak demand data and target the most effective deployment of IRPA.[125] Con Edison is in the process of deploying AMI infrastructure across its service territory and has deployed IRP solutions in areas with and without AMI installed. Con Edison has indicated that performing demand-side IRP programs without such infrastructure is feasible but carries additional challenges and costs.
- The experiences to date in New York State with gas IRP solutions through Con Edison Smart Solutions and National Grid NPS programs, as well as pilots with other gas utilities, provide insight into the opportunities and challenges when relying on non-traditional solutions to defer pipeline investments. Furthermore, these gas IRP solutions leveraged the program designs and operating procedures from existing energy efficiency and electric NWA programs.

[124] On November 10th, New York DPS staff filed an additional extension request to file the report on December 14th, 2020.

[125] Guidehouse notes that there are concerns in Ontario due to the cost and efficacy of AMI due to prior experience with electric smart meters.

8.2 Guidehouse Recommendations

The following list summarizes Guidehouse's key recommendations for the OEB to consider when reviewing Enbridge Gas's IRP proposal and evaluating opportunities to implement natural gas IRP in Ontario:

1. The OEB should encourage the development of a comprehensive Benefit Cost Analysis (BCA) Handbook for Gas IRP, or supplemental guide to the approach outlined in E.B.O. 134 , that evaluates infrastructure, supply-side, and demand-side solutions with a similar set of assumptions for costs and benefits. Stakeholders can provide comment on the proposed BCA Handbook / supplemental guide and build an understanding of the costs, benefits, and risks for different IRP options, and allow for a more transparent IRP process.
2. The OEB should work to more closely align and sequence the planning activities for gas supply, demand, infrastructure, energy efficiency (EE)/demand-side management(DSM), IRP, Utility System Plans (USPs) and other relevant matters, wherever possible. Developing an IRP framework that describes the importance of different planning activities and how the individual activities inform the IRP planning process will allow for more consistent outcomes. For example, filings and related proceedings around gas supply, transportation planning, infrastructure maintenance, and EE/DSM will have relevance for identifying IRP needs and opportunities, and applying a logical sequencing can lead to a more consistent, up-to-date view of these matters for IRP planning.
3. Similar to above, the OEB should develop the gas IRP framework to be consistent with the regulatory framework for natural gas infrastructure approvals. This includes consistency with the OEB's Framework for the Assessment of Distributor Gas Supply Plans, USP filing requirements that are required for cost of service rate applications, and filing requirements and guidelines for approval of hydrocarbon pipelines and facilities, among other regulatory requirements.
4. It is recognized that the OEB considers provincial policy in its decision-making and is guided by statutory objectives (including a statutory objective related to natural gas to promote energy conservation and energy efficiency in accordance with the policies of the Government of Ontario, including having regard to the consumer's economic circumstances). To the extent that the OEB is providing direction that may influence or be impacted by provincial environmental and policy goals, the OEB should clearly define their underlying assumptions regarding applicable provincial policy goals. For example, since future gas demand scenarios are likely to be impacted by energy and environmental policy, clearly defining underlying assumptions relating to provincial climate change policies and decarbonization targets will help to better inform gas network infrastructure decisions going forward.
5. The OEB should work to establish a common understanding amongst stakeholders for the gas IRP process and how benefits, costs, risks, and other parameters will be shared by shareholders, ratepayers, and other parties.
6. The OEB should develop the gas IRP framework to provide utilities with sufficient flexibility to quickly adjust program designs, budgets, implementation plans, and other processes to adapt the IRP programs to each situation. Furthermore, incentives such as Earnings Adjustment Mechanisms (EAMs) should be considered to incentivize innovative approaches that may lead to more targeted outcomes or greater demand

reductions. The long-term effectiveness of EAMs remains to be seen due to the limited track record of these incentives.

7. Should the OEB and the IESO consider developing a specific electric Non-Wires Alternative (NWA) framework in the future, the OEB should consider aligning Gas IRP and Electricity IRP frameworks to share the cost and resource investments to develop operational processes, program design, benefit-cost analyses, and other aspects of either IRP proceeding.[126] Within New York State, leveraging the experience of electric NWA when developing the gas Non-Pipeline Solution (NPS) programs allowed for easier understanding and launch by utility, regulatory, customers, and other stakeholders. Improved coordination across electric and gas utilities will allow for more transparent analysis of the benefits and costs to achieve future provincial policy objectives.

[126] There are multiple other frameworks in Ontario that are similar to a NWA framework. These include the Regional Planning Process and Integrated Regional Resource Plans as well as the Conservation and Demand Management Frameworks, which have guidelines on how conservation should be incorporated in planning. The integration of these frameworks with the Gas IRP process could also be considered.

Appendix A. Acronym List

Acronym	Definition
AMI	Advanced Metering Infrastructure
BCA	Benefit Cost Analysis
BMS	Building Management System
BQDM	Brooklyn Queens Demand Management Project
BTU	British Thermal Unit
C&I	Commercial and Industrial
CAD	Canadian Dollars
CBL	Customer Baseline Load
CECONY	Consolidated Edison Company of New York Inc.
CLCPA	Climate Leadership and Community Protection Act
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
DCF	Discounted Cash Flow
DLC	Direct Load Control
DPS	Department of Public Service (New York State)
DR	Demand Response
DSM	Demand Side Management
Dth	Dekatherm
EAMs	Earnings Adjustment Mechanisms
EM&V	Evaluation, Measurement and Verification
ETEE	Enhanced Targeted Energy Efficiency
ETIP	Energy Efficiency Transition Implementation Plan
GHG	Greenhouse Gas
GJ	Gigajoule
IESO	Independent Electricity System Operator
IRP	Integrated Resource Plan / Planning
IRPA	Integrated Resource Plan Alternative

Acronym	Definition
KEDLI	KeySpan Energy Delivery Long Island
KEDNY	KeySpan Energy Delivery New York
LDC	Local Distribution Company
LNG	Liquefied Natural Gas
LPP	Leak-prone Pipe
m3	Cubic Metres
MRA	Monthly Rate Adjustment
NESE	Northeast Supply Enhancement
NFGD	National Fuel Gas Distribution Company
NGASHP	Natural Gas Air Source Heat Pumps
NPA	Non-pipeline Alternative
NPS	Non-Pipeline Solution
NPV	Net Present Value
NWA	Non-wires Alternative
NY REV	New York Reforming the Energy Vision
NYSEG	New York State Electric & Gas
O&M	Operations and Maintenance
O&R	Orange & Rockland Utilities
OEB	Ontario Energy Board
PtG	Power-to-Gas
PSC	Public Service Commission (New York State)
RFP	Request for Proposals
RNG	Renewable Natural Gas
SCT	Societal Cost Test
TMAs	Transportation Mode Alternatives
Yr	Year

Appendix B. References

Key Resources and References (presented in alphabetic order with hyperlinks)
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National Grid. 2020. "Natural Gas Long-Term Capacity Report." February 24, 2020
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New York Joint LDCs. "Modernized Gas Planning Process: Standards for Reliance on Peaking Services and Moratorium Management." Case 20-G-0131. July 17, 2020
New York Public Service Commission. "Order Approving in Part, with Modification, and Denying in Part Smart Solutions Program." Case." Case 17-G-0606. July 12, 2018.
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New York State Electric & Gas Corporation. "New York State Electric & Gas Corporation And Rochester Gas And Electric Corporation Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020.
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Appendix C. Gas IRP Initiatives at Other New York State Gas Utilities

The following sections summarize the key IRP-related activities for other New York State gas utilities based on each utility's recent filings in the Gas Planning docket.[127] Where applicable, we describe current activities as well as those that are informally suggested as future activities for the following utilities:

- Orange & Rockland Utilities (O&R)
- Central Hudson Electric & Gas
- National Fuel Gas Distribution Company (NFGD)
- New York State Electric & Gas (NYSEG)

Appendix D provides service territory maps for New York State gas utilities highlighted in this report.

C.1 Orange & Rockland Utilities (O&R)

Like Con Edison, O&R[128] is continuing to explore the potential role of RNG to aid in meeting their future gas supply needs, has established standardized interconnection and purchase terms for anaerobic digestion facilities, and has received inquiries from potential RNG project developers. In general, both utilities expect to limit the use of non-pipeline supply-side solutions in the future. Supply-side measures, other than RNG and hydrogen, are generally not aligned with long-term State and City climate change policy goals, face significant siting and permitting hurdles, and may be less reliable and more impactful to the environment than conventional gas pipeline infrastructure. O&R recently conducted an RNG supply analysis for its territory.

O&R has a portfolio of energy efficiency programs, as well as electrification initiatives under New York State Clean Heat to accelerate the adoption of beneficial electrification technologies, such as cold climate air-source and ground-source heat pumps. The utility is developing Gas DR pilots similar to the Con Edison residential and C&I gas DR pilots. O&R recently filed the implementation plan for the gas DR pilot. O&R proposes two programs under the five-year pilot (2020-2024), which would have similar goals and operations to Con Edison programs described above:

- Performance-based Curtailment Program for C&I Customers; and
- Advanced Thermostat Direct Load Control Program for Residential Customers.

[127] New York State Department of Public Service, Proceeding on Motion of the Commission in Regard to Gas Planning Procedures. Case 20-G-0131. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-G-0131&submit=Search

[128] Summarized from Consolidated Edison Company of New York, Inc., Orange and Rockland Utilities, Inc. "Report on Con Edison and O&R Demand Reducing Measures." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B0DA0BE8-F3E3-45F4-AAFB-990F703F036F}

C.2 Central Hudson Electric & Gas

Central Hudson[129] does not currently have any significant supply, transmission, or distribution constraints which would support the immediate development of non-pipeline alternatives or other specialized solutions. Where potential future needs have been identified, Central Hudson seeks to leverage existing programs to address those needs most cost effectively. As more experience is gained, the suitability criteria and process by which to evaluate potential solutions will be further developed.

Central Hudson has a range of traditional energy efficiency programs to meet state regulatory requirements, as well as large C&I customers on interruptible rate schedules that can provide a form of peak load reduction. Central Hudson is currently implementing a subset of Non-Pipeline Alternatives known as Transportation Mode Alternatives (TMA). TMAs are not designed to manage constraints, but instead to facilitate strategic abandonment of leak-prone pipe (LPP) that is not otherwise integral to the distribution system. The program uses a direct install approach for electric heat pump space and water heating systems, as well as other appliances.

Central Hudson's avoided gas distribution study concluded that there are no imminent constraints on the gas distribution system that would warrant the development of an NPS at this time. Nevertheless, Central Hudson has considered this an opportunity to leverage existing initiatives to manage the potential for a future load constraint. Their Locational Benefit-Cost Analysis indicates that smart thermostats are the most cost-effective measure to deliver targeted load reductions. Central Hudson is currently planning to implement a "kicker" incentive to promote smart thermostats to customers served by a specific gas line with the goal of providing more concentrated load relief to that system. Central Hudson currently has the flexibility to implement this within its existing programs and plans to launch the incentive kicker in advance of the 2020 heating season.

Concurrent with the initiative addressing these limited current constraints, Central Hudson is also developing a request for proposals (RFP) to solicit technology and fuel neutral market responses for defined levels of peak reduction throughout the system. Solutions will be evaluated primarily on their ability to reduce wholesale gas costs to Central Hudson. Central Hudson plans to release this RFP by end of year 2020 and conduct a benefit cost analysis to assess the viability of proposals received.

C.3 National Fuel Gas Distribution Company (NFGD)

NFGD[130] reported that it currently has not identified any vulnerable locations in its territory, and does not anticipate any system vulnerabilities within the next five years. Furthermore, the utility believes it will maintain reliable and safe service throughout this forecast period with the continued utilization of the existing contracted firm pipeline and storage capacity, coupled with supplier-provided National Fuel Gas Supply Corporation pipeline citygate-delivered services.

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[129] Summarized from Central Hudson Gas and Electric. "Central Hudson's Demand Reducing Measures Status Report and Proposals." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6F5B0C7C-2D0F-48F9-8E65-0B8DBDDCFE90}

[130] Summarized from National Fuel Gas Distribution Corporation. "National Fuel Gas Distribution Corporation Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6AF770E7-4BCC-4857-80B6-8A6FF25B1BD2}

NFGD has been exploring and developing various supply side initiatives that will lower GHG emissions and ensure continued safe and reliable service for its customers now and in the future, and these include:

- **RNG/Biomethane:** NFGD provides open access to RNG producers via the interconnection language in its tariff and through its existing RNG Interconnect agreement provided in its Gas Transportation Operating Procedures to accept pipeline quality RNG. The utility is working with several RNG developers on numerous projects throughout its service territory to facilitate the growth of RNG production into its pipeline system. These projects include dairy waste, landfill gas and paper waste projects, and have the potential to bring approximately 2.0 BCF onto the system by the end of 2021. NFGD's service territory is uniquely positioned in comparison to other New York LDCs given the proximity of a large number of dairy farms and landfill facilities in their service territory, which are key feedstocks for RNG development.
- **Hydrogen / Power-to-Gas:** NFGD has also been exploring other technologies, such as hydrogen/PtG as a means of utilizing its safe, extensive distribution system to facilitate the State's emissions reduction goals.

In terms of demand-side solutions, NFGD maintains a wide range of traditional energy efficiency programs to fulfill New York State regulatory requirements. The utility has one interruptible customer on a negotiated interruptible rate.

Because NFGD has not and likely will not experience the same supply constraints impacting LDCs in other parts of the state it has not been required to consider and implement some of the more extensive DR and/or non-pipeline alternatives initiatives as those LDCs.

C.4 New York State Electric & Gas (NYSEG)

NYSEG[131] currently uses on-system CNG and energy efficiency programs as IRP solutions and they include:

- **On-System CNG:** NYSEG operates an on-system peaking service CNG facility in Mechanicville, NY. The Mechanicville CNG facility is utilized to maintain adequate system pressures during peak conditions and allowed NYSEG to lift a moratorium on natural gas service in Mechanicville in 2015. The facility was constructed as a long-term supply resource solution to the localized low system pressure issue.
- **Energy Efficiency:** NYSEG maintains a wide range of traditional energy efficiency programs to fulfill NY New York State regulatory requirements. The utility offers interruptible rates and plans to file an update in 2020 to enhance the offering.

NYSEG plans to continue evaluating demand reducing measures including energy efficiency, electrification, DR, non-pipeline solutions and other measures in vulnerable areas as part of the on-going issue resolution in order to meet customer demand, while ensuring the safety and

[131] Summarized from New York State Electric & Gas Corporation. "New York State Electric & Gas Corporation And Rochester Gas And Electric Corporation Status Report And Proposals For The Use Of Demand-Reducing Programs To Address Supply And Demand Imbalances." Case 20-G-0131. August 17, 2020. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={85A63928-D815-4546-9C0D-D67B49E0A846} }

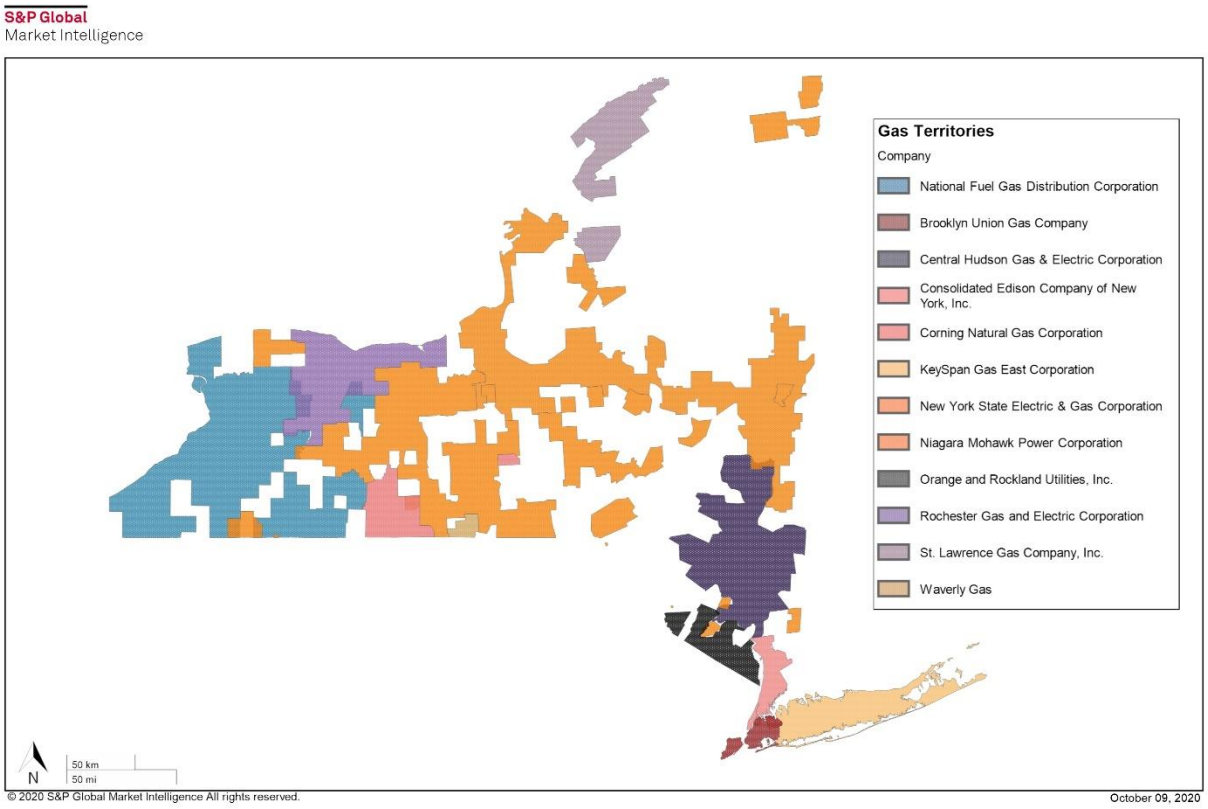
reliability of gas delivery. The utility plans to examine additional opportunities for integration of NPS approaches to solving distribution system needs. In the next year, the utility will retain a consultant to assist in developing a study to examine the feasibility of deploying geothermal district energy systems in the service territory, and to develop plans for subsequent pilot projects where feasible, including but not limited to those areas with existing leak prone pipe. At the conclusion of the study, the utility will make a filing to the PSC, including recommendations for advancing pilot projects of various types and sizes, along with related cost recovery approaches.

Appendix D. New York State Gas Utility Service Territory Maps

This section contains service territory maps for the New York State gas distribution utilities profiled in this report.

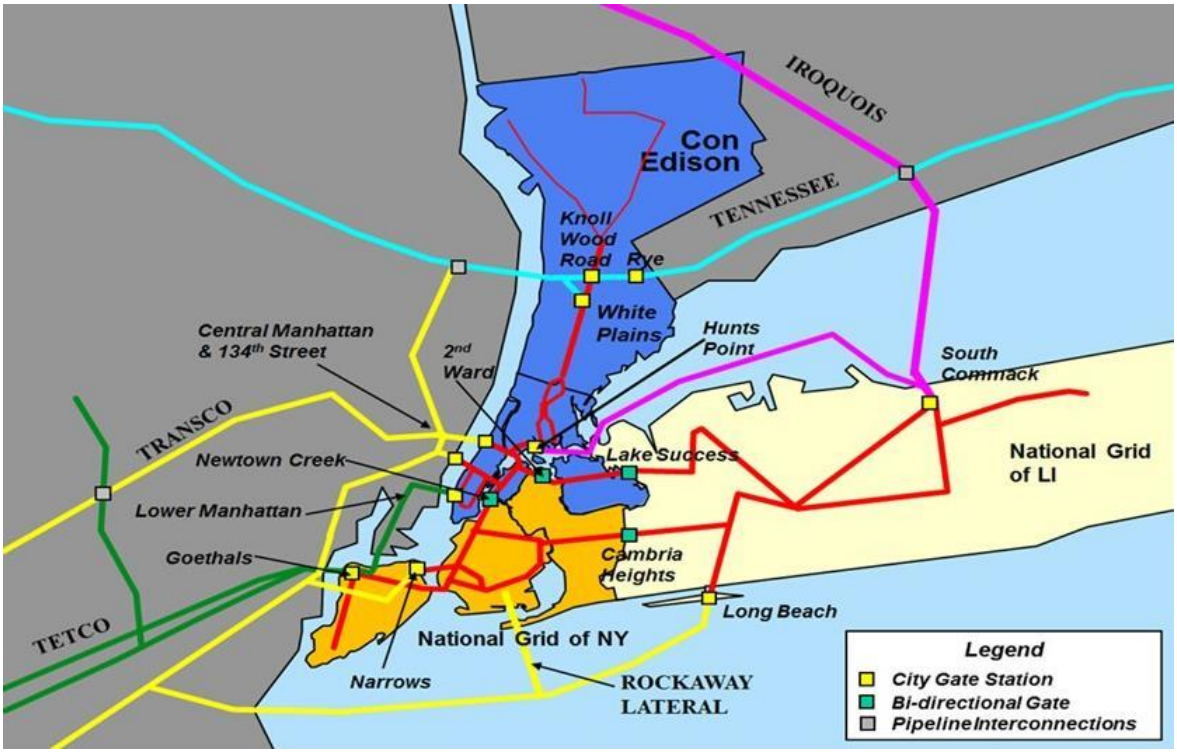
- Figure 4. All New York Gas Utilities
- Figure 5. Con Edison and National Grid Service Areas
- Figure 6. Central Hudson Gas & Electric Service Areas
- Figure 7. NYSEG and Rochester Gas & Electric (RG&E) Service Areas
- Figure 8. O&R Service Area

Figure 4. All New York Gas Utilities



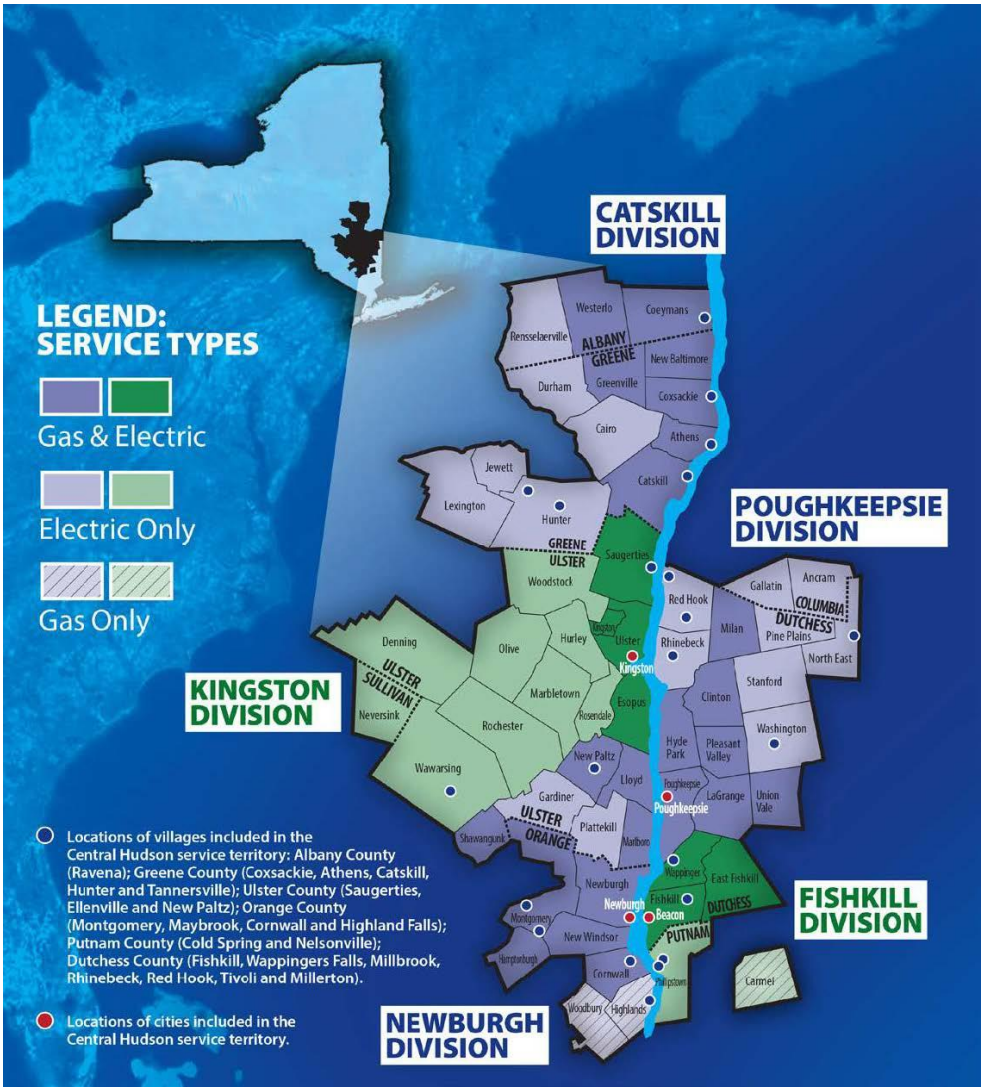
Source: S&P Global Market Intelligence utility mapping tool

Figure 5. Con Edison and National Grid Service Areas



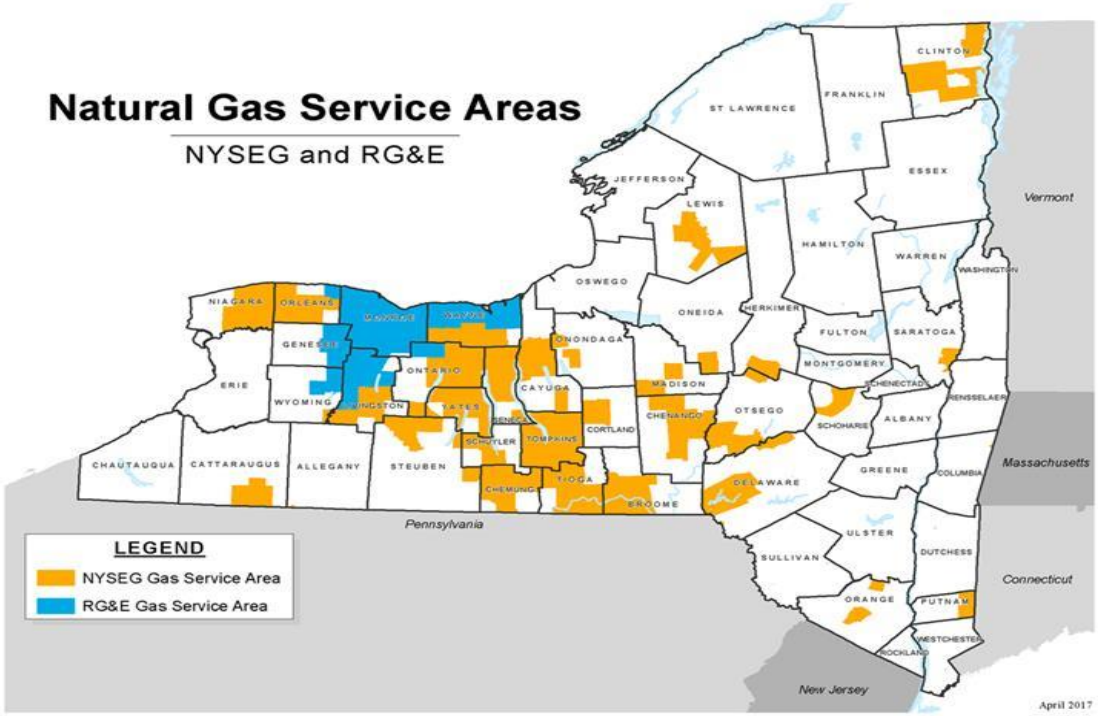
Source: National Grid filings in Case 20-G-0131

Figure 6. Central Hudson Gas & Electric Service Areas



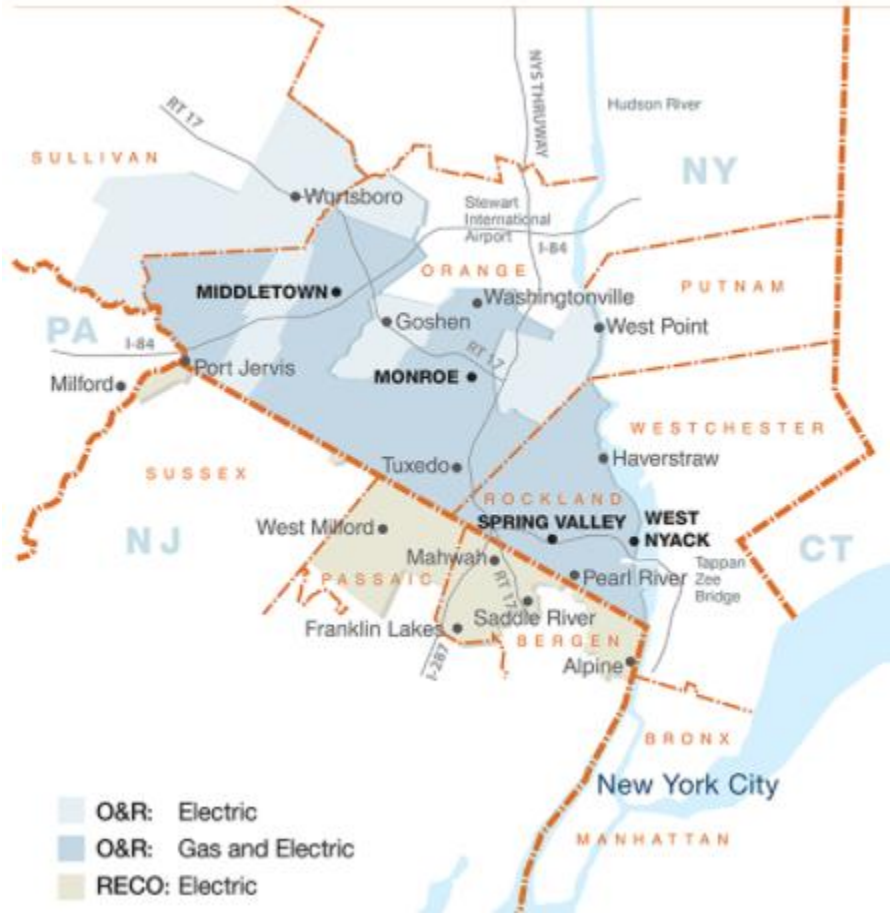
Source: Central Hudson Gas & Electric filings in Case 20-G-0131

Figure 7. NYSEG and Rochester Gas & Electric (RG&E) Service Areas



Source: NYSEG filings in Case 20-G-0131

Figure 8. O&R Service Area



Source: O&R website

Appendix E. New York Electric IRP Resources

In 2014, the New York PSC opened a docket, 14-M-0101 on Reforming the Energy Vision (REV). Within that docket, in 2015-16, the PSC created Distribution System Improvement Plans (DSIPs) for electric utility integrated planning.

Below are some resources related to DSIPs in the REV docket http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=14-m-0101

- New York Department of Public Service Guidance on DSIPs (October 15, 2015). This contains the proposed planning framework. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={F3793BB0-0F01-4144-BA94-01D5CFAC6B63}
- New York PSC Order on DSIPs (April 20, 2016). This contains the adopted planning framework and further detail. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B1C7035C-B447-459A-8957-20BF3BDB6D0F}
- National Grid Initial DSIP filing (July 1, 2016). This includes an analysis of distribution system upgrades potential as NWA candidates (Appendix B in filing) and the BCA handbook (Appendix A in filing) http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={9B424756-6E15-4192-91BE-BF42C03BDD3A}
- National Grid 2020 DSIP plan update (July, 2020). This shows the evolution of DSIPs to include additional topics such as EVs and storage http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={763AD65F-A628-4766-971B-58932A0484F1}

Below are some key requirements for components of the DSIP, as specified by the NY PSC. Most of the items under *Distribution System Planning* category below would be relevant to gas system planning:

1) Distribution System Planning
    a) Forecast of Demand and Energy Growth
    b) Available Distributed Energy Resources (DERs)
    c) Delivery Infrastructure Capital Investment Plans
    d) Beneficial Locations for DER Deployment
    e) Hosting Capacity
    f) Probabilistic Modeling and Load Flow Analyses
2) Distribution Grid Operations
    a) System Operations