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Final Report: NYSEG and RG&E Long-Term Plan As- sessment

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CRA Project No. 60843

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Executive Summary

On May 12, 2022, the New York State Public Service Commission (the “Commission”) issued an Order Adopting Gas System Planning Process (“the Gas Planning Order”) in Case 20-G-0131, creating a process whereby local distribution companies (“LDCs”) file long-term natural gas plans every third year and annual updates in non-filing years. These long-term plans (“LTPs”) provide customers, regulators, and stakeholders with relevant information on how the natural gas utilities plan to adapt to the evolving legislative and regulatory landscape while ensuring they continue to provide safe and reliable service to their customers. They provide the Commission with the ability to evaluate and help shape the future of gas utilities in New York.

The Gas Planning Order requires that LDC’s LTPs demonstrate how they will comply with the requirements of the Climate Leadership and Community Protection Act (“CLCPA”), which contains ambitious climate goals and requires that specific greenhouse gas emissions reduction targets (40% by 2030 and no less than 85% by 2050 from 1990 levels) be met on an economy-wide basis. The CLCPA also requires that New York State direct resources to “achieve a goal for disadvantaged communities to receive 40% percent of overall benefits of spending on clean energy and energy efficiency programs, projects or investments ... provided however, that disadvantaged communities shall receive no less than 35% of the overall benefits.”¹

Besides the CLCPA, the Gas Planning Order also acknowledges the New York State Climate Action Council’s (“CAC”) Final Scoping Plan, which concludes that emissions reductions are needed from all sectors of the economy to meet the requirements of the CLCPA. There are also other statewide efforts, such as the Cap and Invest program, that will impact gas utility planning in the future. Stakeholder involvement is also critical to the LTP process.

The first LDC to submit its LTP in compliance with the Gas Planning Order was National Fuel Gas Distribution Corporation (“NFG”). Charles River Associates (“CRA”)

¹ NY State Senate, Bill S6599 of 2019. *“An act to amend the environmental conservation law, the public service law, the public authorities law, the labor law and the community risk and resiliency act, in relation to establishing the New York state climate leadership and community protection act.”* Pub. L. No. S6599 (2019), 16 (“CLCPA”).

was selected as an independent consultant to assess NFG's LTP. NFG filed its final LTP on July 17, 2023, and it was considered by the Commission at its December 14, 2023 public session with an order issued shortly thereafter.²

Subsequent to the NFG filing, the Commission selected CRA as an independent consultant to assess New York State Electric & Gas ("NYSEG") and Rochester Gas & Electric ("RG&E")'s LTP. NYSEG and RG&E ("the Companies") were identified as LDCs required to file in the second year of the three-year cycle. The Companies filed their Initial LTP on October 2, 2023, their Revised LTP on February 20, 2024, and their Final LTP on April 26, 2024.

In their LTP, the Companies provided a Reference Case, the LTP, and four alternative scenarios combining six different decarbonization actions. Further description of these scenarios can be found in Section 1.7.

The long-term planning process allowed stakeholders to review the Companies' filings, issue data requests, review data request responses, and suggest modifications to the LTP. The schedule was designed such that the Companies' Revised and Final LTPs are meant to reflect the evolving conversation, including Stakeholder comments and suggestions.

CRA has independently moderated the process by reviewing the Initial, Revised, and Final LTPs and all relevant appendices, studies, data requests, stakeholder comments, and reply comments to determine if the Companies' plan complies with the intent of the Gas Planning Order by providing a thoughtful analysis on how it will serve its long-term customers' energy demand in a cost effective, yet equitable manner while complying with new and evolving legal and regulatory requirements.

CRA generally considered the accuracy and vigor of the analysis, the consideration given to planning for statewide climate goals, and issues that directly impact the well-being of customers.

² NY PSC, *In the Matter of a Review of the Long-Term Gas System Plan of National Fuel Gas Distribution Corporation, Order Implementing Long-Term Natural Gas Plan with Modifications*, issued December 14, 2023. Case 22-G-0610.

The Final LTP contains significant changes in assumed costs and cost-effectiveness of the various decarbonization measures modeled by the Companies compared to the Initial and Revised LTPs. Please see Section 1.7 for a table comparing these metrics.

CRA acknowledges that the NYSEG/RG&E Final LTP was filed prior to this Final Report. Unless otherwise stated, for the recommendations provided in this report, CRA is recommending the Commission require the Companies to modify their Final LTP accordingly. This Report may not consider all written stakeholder feedback or the Companies' responses to data requests received after May 15, 2024.

As per CRA's recommendation, the Companies have provided a list of changes made as a result of stakeholder feedback. Please see Chapter V, Section C of the Final LTP.

Key CRA recommendations for each topic area are summarized below. This Report may not consider all written stakeholder feedback or the Companies' responses to data requests received after May 15, 2024.

Reliability

- Regarding the 2020 Pipeline and Hazardous Materials Safety Administration (“PHMSA” rule on Maximum Allowable Operating Pressure (“MAOP”) reconfirmation, the Companies should develop a comprehensive compliance plan that identifies and justifies which MAOP reconfirmation method is most suitable, technically feasible, and cost-effective. The plan should provide detail at the segment/project level for transmission pipe for each impacted year of the LTP. In addition, detailed plans should be provided in any updates to the LTPs, including capital plans and any evaluations for potential Non-Pipe Alternative (“NPA”) solutions. Status reports should be included in the Companies’ Annual LTP updates and incorporated in the Companies next LTP submission to inform stakeholders of potential impacts and tradeoffs.

Forecasted Design Day

- The Companies should evaluate the “NYS Climate Impact Assessment” document and incorporate the relevant data for its service areas into a study that includes sensitivities of the long-term impacts, as well as the implications on the LTP process and key assumptions. The study should be filed within the LTP docket to inform stakeholders of potential implications and tradeoffs.
- The Companies should update their design and normal degree day calculations to incorporate recent data on customer usage and usage per degree day, including the effects of increased energy efficiency, and results should be incorporated into updates to the LTP.

Gas Supply and Upstream Resources

- The Companies should perform a study to justify the need for a reserve margin above design day planning and evaluate the tradeoffs associated with incorporating an operating reserve margin.
- CRA recommends that the Companies develop a more robust and comprehensive approach to reconfiguring their firm capacity portfolio that

includes establishing a ranking criteria to manage contract restructuring and de-contracting of capacity, considering the demand reductions reflected in the LTP. This could result in reduced costs for customers without compromising reliability throughout the transition period.

- A report should be developed that includes metrics that can be shared with stakeholders as part of the LTP process that summarizes the fixed pipeline and storage cost reduction benefits achieved by the Companies' capacity release transactions (including asset management agreements) and the resulting reductions in costs for customers.
- CRA acknowledges the Companies' response to stakeholder feedback, as they are now modeling a reduction in fixed pipeline and storage costs in the LTP to reflect the potential for contract restructuring as design day demand decreases, consistent with concepts included in the CRA/Stakeholder scenarios. However, the fixed pipeline and storage costs in the Reference Case and all Company scenarios are assumed to remain constant over the forecasted period. CRA recommends adjusting this assumption for the Reference Case and all Companies' scenarios, consistent with the declining design day demand over time shown in the LTP.³ The LTP shows a 25% and 19% decrease in design day demand throughout the forecast period for NYSEG and RG&E, respectively.⁴ Maintaining a constant level of pipeline and storage capacity in these scenarios despite declining design day demand and potentially increased rates charged by pipelines and storage providers (and approved by the Federal Energy Regulatory Commission ("FERC") or negotiated by the Companies) could pose an undue hardship on customers.

Non-Pipe Alternatives

³ See Table D-24 for NYSEG and Table D-69 for RG&E in Appendix D of the Final LTP.

⁴ NYSEG and RG&E, *Final LTP Appendix D*, D-24 and D-69.

- The Companies should incorporate generic NPA projects and model their impacts on demand and cost reductions in the LTP and all scenarios, drawing from their experience with the NPA process, including those located in areas identified as vulnerable areas.
- The Companies have identified several areas to target for the leak-prone main (“LPM”) NPA Whole Home Electrification Program. They have engaged a third-party expert with experience educating customers on electrification solutions for their homes and businesses to perform outreach to customers located within targeted LPM areas to promote full-building electrification incentives. The third-party expert is to also provide feedback to the Companies regarding program development and implementation.
 - The Companies should report these areas and discuss how this program can be incorporated and modeled into their long-term gas planning procedures and annual LTP updates.

Moratoriums (Distribution Operations)

- Based on CRA’s findings and review of the Companies’ Final LTP, the Companies appear to have reasonably addressed the moratorium process thus far. CRA recommends that the Companies continue to evaluate potential vulnerable areas on their systems and proactively conduct community outreach and education with stakeholders and entities interested in working on potential NPA solutions.

Strategic Downsizing of the Natural Gas System

- The Companies’ LTP disadvantages the Full Electrification scenarios by assuming the same level of capital investment would be necessary despite a reduction in customer count over time. CRA recommends the Companies develop scenario-specific capital expenditure (“CapEx”) forecasts for the LTP and each alternative scenario, showing a substantial decrease in CapEx in their full electrification scenarios reflecting downsizing opportunities with a shrinking customer base.

- In Section 3.10.4, CRA recommends that the Companies assume a portion of their customer base fully electrifies. In accordance with this recommendation, CRA advises that the Companies update their CapEx and operating costs forecast to reflect potential downsizing opportunities as customers fully electrify in the LTP. Emissions would further be reduced in the benefit cost analysis (“BCA”) as total mileage of pipe declines.
- The Gas Planning Order requires LDCs to identify the locations of specific segments of leak-prone pipe (“LPP”) that could potentially be abandoned in favor of an NPA within their Annual Update filed after their Final LTP.⁵ CRA recommends the Companies identify these segments in their LTP rather than wait until the Annual Update and consider these segments in the context of strategic downsizing.
- CRA recommends the Companies develop a joint-planning approach across their electric and gas companies to develop the most cost-effective and efficient solutions for customers and the Companies to support strategic downsizing and increased electrification. The Companies have discussed this in their Implementation plan in the LTP.
- As per the Technical Conference on February 13th discussed in Section 3.6.2, stakeholders are supportive of the Companies’ beginning to identify these potential areas for decommissioning. As recommended by stakeholders during this technical conference, CRA also recommends that a pilot program be developed to determine the best approach for downsizing a specific area of the distribution system. This should be an exercise conducted with customers and stakeholders (including local community members) to define the issues, barriers, and costs associated with eliminating service in a small, defined region, and working with customers and stakeholders to assess its viability. This effort should be performed together with the NPA evaluation discussed previously. Successfully implementing a pilot program of this nature would provide NYSEG/RG&E and other gas utilities, regulators, and stakeholders

⁵ NY PSC, “Order Adopting Gas System Planning Process,” 39. NY PSC Case 20-G-0131, May 12, 2022.

with critical information. It would help determine the best path forward to strategic decommissioning and potentially provide a model for other areas.

Renewable Natural Gas

- The Companies' LTP includes a significant level of renewable natural gas ("RNG") – a level that is aligned with the Companies' CLCPA scenario. To achieve the level of RNG production described in the LTP, the Companies would need to begin to develop the resources immediately and secure supply within their service territory, as well as investigate the approaches for securing supply from out of state (in Pennsylvania and Ohio). This would require developing a plan, defining the required investment level, the approach for procuring the environmental credits, and mechanisms for cost recovery. Currently, there is no mechanism established for recognizing the environmental value or obtaining cost recovery for this environmental value in New York.

The animal waste and food waste categories appear to be particularly challenging market segments from which to develop supply at the level required due to the complexity of developing numerous agricultural digester projects and connecting them to the pipeline network. The LTP uses the Optimistic Scenario of recent American Gas Association ("AGA") and New York State Energy Research and Development Authority ("NYSERDA") studies conducted by ICF for estimating the RNG market. Given the current state of market development and the complexity of developing supply, it may be more appropriate to consider using the Achievable Deployment scenario to estimate supply and to reflect a more gradual ramp rate for adding supply, to reflect the complexity of developing the market.

- Based on CRA's assessment of the current RNG supply plan and risks identified by stakeholders, CRA recommends that RNG supply be targeted only to hard-to-electrify end-use market segments, such as industrial processes that require natural gas. As described in Chapter VII ("Conclusions and Implementation Actions") of the LTP, discussions with major industrial customers will help the Companies determine the potential for this use case. This may also require the development of a transition plan for these customers

to allow them to procure RNG in this manner. The New York Cap and Invest program may help to provide further clarity on this process.

- CRA also recommends that the Companies continue to investigate RNG supply options and costs, while working with their customers that do not have alternatives to natural gas for reducing GHG emissions. In this way, as they develop supply, they would also be developing the end-use market, and can work with these customers to assess their willingness and ability to pay any required premium for RNG and its environmental attributes.

Hydrogen

- While the Companies assume blending up to 20% by volume, no evidence yet suggests the specific NYSEG and RG&E natural gas systems can safely deliver this hydrogen/natural gas blend. CRA recommends NYSEG and RG&E consider a study or pilot program to assess appropriate safe hydrogen blending limits.
- CRA recommends that the Companies focus their efforts on hydrogen use by working with the industrial sector to understand the best direct applications that do not require system-wide blending. Updates and progress related to these conversations with industrial customers should be provided publicly on a periodic basis either through the Companies' website and/or the Annual Updates to the LTP.

Energy Efficiency/Demand-Side Management and Demand Response

- CRA recommends that the Companies develop a demand-side management program that specifically targets NPA opportunities and areas of the network that are candidates for strategic downsizing. The Companies have indicated that they commenced discussions with other New York utilities that currently offer gas demand response programs to gain insights and lessons learned. CRA recommends that the Companies report the status of their evaluations of programs by other New York utilities regularly in a public forum, incorporating Stakeholder recommendations, and their planned next steps.

- CRA recommends that the Companies continue to explore incorporating new tariff offerings and programs into the pilots that they are planning that would provide appropriate incentives for customers to participate, including new rate designs and payment structures that incentivize sustained consumer engagement, while undertaking consumer outreach and education.

These programs could achieve targeted peak load (peak-hour and peak day) shifting and/or reduction, reducing load on the Companies' distribution systems that would result in quantifiable benefits by avoiding infrastructure investment. Additionally, customers could benefit from supply cost savings as the result of these programs and the Companies could avoid utilizing market-priced commodity delivered/peaking gas services and/or compressed natural gas ("CNG").

This would also serve to further the deployment of NPAs and allow the Companies to achieve financial incentives by sharing benefits through the achievement of performance metrics. Accordingly, the Companies should consider modeling a reduction in demand as a result of these demand response programs.

Electrification

- In its Preliminary Findings Report, CRA recommended the Companies adjust their Reference Case for the Final LTP such that it includes the impact of the 2023 New York budget bill S4006C. This would allow for a fairer comparison of the LTP and any other scenario to the Reference Case, as the costs of electrifying these new buildings will be included and will no longer be counted as a cost (which could reduce the Benefit Cost Analysis ("BCA")) in the LTP. The Companies indeed made this adjustment in their Final LTP.
- CRA recommends that the Companies assume that customers weatherize prior to electrifying. This is considered best practice and is required for customers who are receiving certain NYSERDA rebates and incentive programs for heat pumps. This will allow the customers to heat and cool their homes more efficiently, resulting in reduced operating costs. A weatherized dwelling can be fitted with a more optimally sized heat pump, further reducing

ongoing energy costs. The LTP should include optimally sized heat pumps and the BCA should reflect reduced up-front cost and ongoing energy cost saving.

- In their LTP, the Companies have assumed that no homes currently using a boiler will electrify. CRA believes that there will be significant opportunities to convert these homes to both full and partial electrification. Consideration should be given for additional electrification of this market segment.
- CRA recommends that additional building demographic details be added to the Companies' models that will allow heat load and cost conversion estimates to be made that will be more representative of the homes and buildings in the Companies' service territories.
- CRA recommends that the Companies model a portion of the customer base converting to full electrification over time in their LTP rather than only in their alternative scenarios. This amount could be informed by market studies over time and adjusted accordingly as the Companies develop a better understanding of customer adoption rates.
- Similar to CRA's recommendations in the Strategic Downsizing and NPA sections, CRA also recommends the Companies develop criteria for a neighborhood that is a candidate for full electrification and identify potential neighborhoods that fit these criteria. Criteria can include number/percentage of electrified customers, areas with declining gas demand, locations that include leak prone infrastructure, and whether the area is a 'dead-end' of the gas system. This work will also support the Strategic Downsizing Pilot program discussed earlier.
- CRA recommends that the Companies include market studies and surveys in its future pilot programs involving electrification that will support the development of the information required to inform improved adoption rate forecasts.

Industrial Customers

- CRA recommends that the Companies remove industrial Carbon Capture and Storage (“CCS”) from their LTP, until they have confirmation from their industrial customers that they are considering pursuing these investments. In the Companies Implementation Plan, they discuss starting to engage with their customers regarding the possibility of these solutions in the future. They also discuss developing a program with industrial customers for potential CCS projects and approaches to obtain cost recovery. CRA recommends the Companies provide annual updates on their progress in this area.

Meeting the Requirements of the Climate Leadership and Community Protection Act (“CLCPA”)

- The NY PSC has also confirmed that the gas planning process should ensure gas utilities “reduce gas infrastructure and GHG emissions in a manner consistent with the CLCPA.”⁶ While the CLCPA’s targets do not specifically require gas utilities to reduce emissions by 85% by 2050, absent other guidance, it is reasonable to assume that gas utilities will need to meaningfully reduce emissions.

NYSEG and RG&E Long-Term Plan Methodology (Decarbonization Model)

- CRA recommends that in future revisions of its model and LTP, discussion related to adoption rates be addressed with more detail and clarity due to the importance of understanding the relationship between cost, convenience, and customer choice, and the impact these factors will have on the adoption of various decarbonization measures. Adoption rates will only be understood by performing research, issuing customer surveys, hosting demonstrations, and considering other approaches that will provide a more complete understanding of costs, performance, customer behaviors, and impact on fuel consumption and emissions. In their Implementation Plans the Companies have discussed

⁶ NY PSC, *Order Adopting Joint Proposal*. NY PSC Case 22-G-0320. 52. October 12, 2023 (“Rate Order”).

collecting this type of data and learning customer adoption. CRA recommends that the Companies develop a detailed plan for how they will accomplish this.

- Regarding electric price forecasting, CRA recommends the Companies reevaluate their methodology for the LTP and all scenarios. CRA's internal analysis suggests that the Companies are likely significantly overstating the modeled residential customer electric supply prices in both the LTP and Full Electrification scenarios.

Emissions Accounting

- As the LTP process evolves, NYSEG and RG&E should continue to assess their methodology for emissions accounting, following guidance from state and federal regulators.

Benefit-Cost Analysis

- In its Preliminary Findings Report, CRA recommended the Companies perform all three cost tests (Societal Cost Test, Rate Impact Measure, and Utility Cost Test) for the LTP and its scenarios. These alternative tests help stakeholders understand and evaluate the LTP and its scenarios. The Companies did make this change in their Final LTP.
- CRA encourages the Companies to treat federal incentives as a benefit, which would serve to improve the BCA results.
- There were no Avoided Pipeline and Storage Fixed Costs in the Companies' full electrification scenarios or alternative hybrid heating scenarios, despite the Companies forecasting Avoided Pipeline and Storage Fixed Cost reductions in the LTP itself. CRA believes scenarios in which customers fully electrify should show a higher level of avoided pipeline and storage fixed cost reductions than in the LTP. This would improve the BCA for these full electrification scenarios.

Accordingly, CRA recommends the Companies reevaluate the level of modeled avoided non-commodity gas costs modeled in its two full electrification scenarios (CLCPA Full and Delayed Full), reflecting a material

amount of both Avoided Gas System O&M and CapEx Revenue Requirement and Avoided Pipeline and Storage Fixed Costs. Compared to the LTP, resulting in an improved BCA of these scenarios.

Affordability and Impact on Customer Bills and Rates

- The Companies should consider showing the potential impacts of federal incentives on total customer costs in each of the scenarios. New York State and federal funding make residential weatherization and heat pump installation significantly cheaper through rebates and tax credits. Including this in scenario modeling will give a more accurate picture of total plan cost for each decarbonization scenario.

Disadvantaged Communities

- CRA recommends the Companies quantify total benefits to disadvantaged communities and compare it to the total plan benefits.

Stakeholder-Driven Alternative Scenarios

- On January 30, 2024, after research, internal discussion, and stakeholder feedback, CRA finalized and distributed four suggested scenarios. The Companies included the results of these scenarios in their LTP. Stakeholders and the Commission should review and consider these results to guide the LTP's actions.
- Based on observations from the results of CRA's stakeholder-driven alternative scenarios, CRA recommended two additional scenarios as part of its eighth data request. A discussion of these scenarios can be found in Section 3.18.

New York Cap-and-Invest ("NYCI")

- Within a reasonable timeframe after the Commission issues an order on the Companies' LTP (by their first annual update, latest), the Companies should present sensitivities on NYCI's potential impact to their LTP, including BCA analyses. The Companies should work with the Commission to ensure that they are planning properly and adjusting potential investment decisions based

on the impact of the NYCI. The Companies have indicated they will continue to monitor Cap-and-Invest, but these activities will assist in helping to prepare for the potential impact on their LTP.

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Acronyms and Defined Terms

Acronyms

ACGWG	Avoided Cost of Gas Working Group
ACS	Arlington Storage Company
AGT	Algonquin Gas Transmission
AMI	Advanced Metering Infrastructure
ASHP	Air-Source Heat Pump
BCA	Benefit-Cost Analysis
BIL	Bipartisan Infrastructure Law
BTU	British Thermal Unit
CAC	New York State Climate Action Council
CAGR	Compound Annual Growth Rate
ccASHP	Cold Climate Air Source Heat Pumps
CEF	Clean Energy Fund
CLCPA	Climate Leadership and Community Protection Act
CNG	Compressed Natural Gas
CO _{2e}	Carbon Dioxide Equivalent
CRA	Charles River Associates, Inc.
DAC	Disadvantaged Community
DEC	The New York Department of Environmental Conservation
DOE	United States Department of Energy
DPS	New York State Department of Public Service
DR	Data Request
EDF	Environmental Defense Fund
EE	Energy Efficiency
EEPS	Energy Efficiency Portfolio Standard
EGTS	Eastern Gas Transmission and Storage
EJ	Earthjustice
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
GSHP	Ground-Source Heat Pump
GWP	Global Warming Potential
HDD	Heating Degree Days
HEEHRA	High Efficiency Electric Home Rebate Act
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
IWG	The Federal Interagency Working Group
JP	Joint Proposal
LMBP	Location Based Marginal Price

LDC Local Distribution Company

Acronyms (continued)

LMI	Low-and Moderate Income
LPM	Leak-Prone Main
LPP	Leak-Prone Pipe
LPPR	Leak-Prone Pipe Replacement
LTP	NYSEG and RG&E's Initial Long-Term Plan
MEA	Marquette Energy Data Analytics
MMBtu	One Million British Thermal Units
MMP	Moratorium Management Procedures
MT	Metric Ton
NENY	New Energy New York
NFG	National Fuel Gas Distribution Corporation
NPA	Non-Pipeline Alternative
NPV	Net Present Value
NYCI	New York Cap-and-Invest Program
NY-GEO	New York Geothermal Energy Organization
NY PSC	The New York State Public Service Commission
NYSEG	New York State Electric and Gas Corporation
NYSERDA	New York Energy Research and Development Authority
O&M	Operation and Maintenance
PHMSA	Pipeline and Hazardous Materials Safety Administration of U.S. Department of Transportation
PUSH	People United for Sustainable Housing
RG&E	Rochester Gas & Electric Corporation
REV	Reforming the Energy Vision
RNG	Renewable Natural Gas
SC	The Sierra Club
SC/EJ	The Sierra Club and Earthjustice
SCC	Social Cost of Carbon
SCE	Supply-Constrained Economy
SEEP	System Energy Efficiency Plan
SRO	NYISO System Resource Outlook
TCO	Columbia Gas Transmission
TCPL	TransCanada PipeLines
TGP	Tennessee Gas Pipeline
TVC	Traceable, Verifiable, and Complete
UNFCCC	United National Framework Convention on Climate Change
UTEN	Utility Thermal Energy Network

Defined Terms

2016 Order	The Order Establishing the Benefit Cost Analysis Framework
Allowances	Greenhouse Gas Emissions Allowances
CLCPA Format	Emissions accounting method compliant with the CLCPA
CapEx	Capital Expenditures
Commission	The New York State Public Service Commission
Companies	New York State Gas and Electric and Rochester Gas and Electric (NYSEG) and Rochester Gas and Electric (RG&E)
DPS Staff	Department of Public Service Staff
EE/BE Portfolio Proposal	NYSEG and RG&E's Energy Efficiency Portfolio Proposal, Case 18-M-0084, January 16, 2024.
Empire	Empire Pipeline
Gas Planning Order	The Commission's Order Adopting Gas System Planning Process
Iroquois	Iroquois Gas Transmission
Local Distribution Utilities	Natural Gas Utilities
Model	NYSEG and RG&E's decarbonization economic model
NFG LTP Order	NY PSC Order Implementing Long-Term Natural Gas Plan with Modifications – Case 22-G-0610, Released Dec 14, 2023
North Country	North Country Gas Pipeline
Order Adopting MMP	NY PSC Order Adopting Moratorium Management Procedures, Case 20-G-0131, May 12, 2022.
Rate Order	NY PSC Order Adopting Joint Proposal, Case 22-E-0317, October 12, 2023.
Report	The CRA Initial Findings Report

1. Introduction

1.1. Background

On May 12, 2022, the New York State Public Service Commission (“Commission” or “NY PSC”) issued an Order Adopting Gas System Planning Process (“Gas Planning Order”) in Case 20-G-0131. The Commission framed the intent of the Order with the following introductory statement:

Accordingly, through this Order, the Commission adopts modernized long-term natural gas planning procedures to ensure that the State, customers, stakeholders, and all other interested entities have the opportunity to understand and engage in the future of natural gas infrastructure in the State.⁷

In addition, the Commission recognized that natural gas planning and operational practices need to adapt to the evolving energy landscape while ensuring gas utilities maintain reliability and resiliency. To this end, the Gas Planning Order adopted long-term planning procedures that aim to address this and key topics such as gas utility decarbonization. It also outlines specific procedures ensuring that the state, customers, stakeholders, and all interested entities may effectively participate in the planning process.

As part of the Gas Planning Order, gas utilities (also known as “Local Distribution Companies” or “LDCs”) must file comprehensive long-term natural gas system plans (“LTPs”) on a three-year cycle.^{8,9} In years two and three of the cycle, LDCs must file annual reports to update the Commission and stakeholders on the progress they have made in following their plans as well as how relevant emerging information may modify their planning.

The Gas Planning Order requires that the Commission “consider whether its decisions are inconsistent with or will interfere with the attainment of the statewide GHG

⁷ NY PSC, “Order Adopting Gas System Planning Process,” 1. NY PSC Case 20-G-0131, May 12, 2022.

⁸ In this report, “gas utilities” and “LDCs” will be used interchangeably.

⁹ NY PSC, “Order Adopting Gas System Planning Process,” 20 – 21. NY PSC Case 20-G-0131, May 12, 2022.

emissions limits established in Environmental Conservation Law Article 75.”¹⁰ Therefore, the gas utilities must comply with the CLCPA while maintaining system reliability and minimizing rate increases.

The Gas Planning Order also requires that an independent consultant evaluate each LTP filing:

*The Commission agrees with having a consultant independent of the LDC provide analysis of the LDC’s filings. The consultant will work at the direction of DPS Staff, with appropriate non-disclosure agreements. We expect that the consultant will participate in stakeholder meetings and be able to make requests of the LDC and stakeholders participating in the long-term planning process. This will ensure that the consultant, Staff, and the Commission have a complete understanding of any proposals. We expect that the consultant will help evaluate the economic and environmental tradeoffs associated with different pathways. Additionally, the consultant will work with the LDC to run a reasonable number of versions of the LDC’s hydraulic modelling, based on the consultant’s independent analysis and based on its assessment of stakeholder input.*¹¹

In 2022, Charles River Associates, Inc. (“CRA”) was selected to assess National Fuel Gas Distribution Corporation’s (“NFG”) LTP. Working at the direction of the New York Department of Public Service (“DPS”) Staff, CRA filed three reports that reviewed NFG’s three LTPs and assessed compliance with the Gas Planning Order. CRA also functioned as the manager for stakeholder involvement throughout the process. More information on CRA’s role can be found in Section 1.5. Please see NY PSC Case 22-G-0610 for NFG’s LTP and CRA’s reports.¹²

Subsequently, in 2023, CRA was selected to assess New York State Gas and Electric’s (“NYSEG”) and Rochester Gas and Electric’s (“RGE”) (collectively, “the

¹⁰ *Id.*, 57.

¹¹ *Id.*, 26 – 27.

¹² CRA’s Final Report for the NFG LTP can be found at <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={60EB8D89-0000-CE3C-BCFE-F01645A49384}>. NFG’s Final LTP can be found at <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={205D6589-0000-CB4F-9536-3A1F1B087987}>.

Companies”) LTP.¹³ CRA has reviewed the Companies’ Initial and Revised LTP documents and all relevant appendices to determine the plan’s reasonableness.

The LTP is required to consider non-pipeline alternatives (“NPAs”) and to evaluate the benefit-cost analysis (“BCA”) of each alternative scenario. Additionally, the LDC must present a “no infrastructure” case. The Commission is investigating the use of NPAs as well as demonstrating the cost effectiveness of an investment with a BCA in other ongoing Commission dockets. The Avoided Cost of Gas Working Group (“ACGWG”), established through Case 20-G-0131, is also discussing these matters. NPAs and BCAs will continue to be an integral aspect of gas planning and are recognized as such in this report. CRA and stakeholders have the ability to suggest alternative scenarios for the Companies to run, which will allow for further understanding of key issues and how they would impact the LTP.

This Final Report (“Report”) is based on the Companies’ Final LTP, which is the third and final version of the filing. Additionally, CRA’s data requests provide stakeholders with further information about the Companies’ planning and analysis. CRA recognizes its role in facilitating the critique of the Companies’ plan as a central requirement of the Gas Planning Order.

1.2. The Climate Leadership and Community Protection Act

The CLCPA was signed into law in New York on July 18, 2019. It contains ambitious climate goals and requires specific greenhouse gas (“GHG”) emissions reduction targets (40% by 2030 and no less than 85% by 2050 from 1990 levels) be met on an economy-wide basis. The CLCPA also requires that New York State direct resources to “achieve a goal for disadvantaged communities to receive 40% percent of overall benefits of spending on clean energy and energy efficiency (“EE”) programs, projects or investments . . . provided however, that disadvantaged communities shall receive

¹³ NYSEG and RG&E are filing their LTPs collectively as part of NY PSC Case 23-G-0437 because they are both owned by Avangrid, Inc.

no less than 35% of the overall benefits.”¹⁴ With regard to the CLCPA, this report will focus on the impact of the Companies’ LTP on their GHG emissions.

As part of the CLCPA, NY has allocated \$6.8 billion to reduce building emissions. This funding will likely be invested largely in EE and a broad application of air source and ground-source heat pumps. There are also plans to commit \$1.6 billion to The NY Green Bank, which will assist with financing these investments.¹⁵

1.3. Climate Action Council Scoping Report

On December 19, 2022, New York’s Climate Action Council (“CAC”) made its Final Scoping Plan available to the public.¹⁶ The Final Scoping Plan concludes that emissions reductions are needed from all sectors of the economy to achieve the targets of the CLCPA. The Scoping Report offers several recommendations for consideration by state agencies as well as the New York State Legislature.

Given that many of these recommendations require legislative or agency action and some may conflict with current policies or statutes, they will be referenced as guidance, but not relied upon in isolation when evaluating the Companies’ Revised LTP. Further consideration can occur in the Companies’ annual LTP update process or their subsequent LTP filing when the recommendations are acted upon by the responsible state agencies or the state legislature. CRA will, however, recommend that the Companies’ LTP incorporate approaches which are consistent with recent Commission policy applications.

Related to the Final Scoping Plan, specific goals and related legislation have been passed recently. For example:

¹⁴ New York State Senate, Bill S6599 of 2019. “An act to amend the environmental conservation law, the public service law, the public authorities law, the labor law and the community risk and resiliency act, in relation to establishing the New York state climate leadership and community protection act.” Pub. L. No. S6599 (2019), 16.

¹⁵ New York State. “Governor Hochul Announces \$8.5 Million to Support Companies Commercializing New Climate Technologies,” Available from <https://www.governor.ny.gov/news/governor-hochul-announces-85-million-support-companies-commercializing-new-climate>; accessed November 2, 2023. October 2022.

¹⁶ CAC, “Climate Action Council Final Scoping Plan,” December 2022.

- Governor Hochul's announced plan for the state to have two million climate-friendly homes by 2030, which will include a minimum of one million electrified homes and up to one million electrification-ready homes.¹⁷
- In May of 2023, as part of Governor Hochul's 2023 executive budget, New York State advanced comprehensive legislation for constructing zero-emission new homes and buildings. This bill will require the following:
 - Starting in 2026, the law will prohibit the installation of fossil-fuel equipment in most new buildings under eight stories; and
 - Starting in 2029, new commercial buildings and buildings eight stories and over will be prohibited from using fossil fuels (exemptions will apply for emergency backup and standby power for certain segments and critical loads).¹⁸

1.4. Future Climate Policy, Legislative, and Regulatory Considerations

1.4.1. Affordable Gas Transition Act

In January 2024, Governor Hochul introduced changes to the law that governs utility service that would give regulators the authority to establish regulations to transition away from gas distribution systems. This law has not passed as of the date of this report filing, but if passed as proposed, it would have had a significant impact on future LTPs. For example, it would repeal the requirement for gas utilities to hook up new customers on request, and it would restrict gas distribution companies from expanding service territories beginning as early as 2026. It would also give the NY PSC the

¹⁷ New York State, "Governor Hochul Announces Plan to Achieve 2 Million Climate-Friendly Homes by 2030," Available from <https://www.governor.ny.gov/news/governor-hochul-announces-plan-achieve-2-million-climate-friendly-homes-2030>. January 2022.

¹⁸ NYSEDA, "FY 2024 Budget Highlights Energy Affordability, Sustainable Buildings, and Clean Energy," Available from <https://www.nyserda.ny.gov/About/Newsroom/2023-Announcements/2023-05-03-Governor-Hochul-Announces-FY-2024-Budget-Investments-in-Energy-Affordability#:~:text=Building%20Decarbonization&text=The%20Budget%20includes%20requirements%20for,buildings%20by%20December%2031%2C%202028>; accessed October 28, 2023.

authority to retire portions of the gas distribution grid in cases where the Commission determines it is necessary in order to achieve the goals of the CLCPA.¹⁹

Some of the key provisions of the Affordable Gas Transition Act include the following:

- Prohibiting gas utilities from building new infrastructure that would extend service into parts of the state not served prior to December 31, 2025, except where the NY PSC grants an exemption.
- Increasing the cost to connect to the gas system by ending the practice of spreading the cost of new hookups among all ratepayers if the new customer is within 100 feet of a gas main. The bill would maintain the so-called 100-foot rule subsidy for electric service.
- Allowing gas utilities to continue to sign up new customers within their existing territory but requiring they provide new customers with information on weatherization, demand-side management, incentives for installing electric equipment, and programs that support rooftop solar and other distributed energy resources.
- Expanding the NY PSC's authority to prevent new customer attachments or increases in deliveries to existing customers. Currently, this power is restricted to cases where the NY PSC determines that a gas shortage will prevent a distributor from meeting the needs of new customers. The bill would allow the Commission to exercise that authority when they find that continued gas service is inconsistent with achieving CLCPA targets. It would also remove a provision that limits this authority to the duration of a gas supply emergency.

In determining whether new gas service is warranted, the NY PSC could consider potential impacts on economic development opportunities, new and existing customers, system safety and adequacy, customers with limited ability to convert to

¹⁹ DiChristopher, Tom, *NY governor's budget gives regulators more power to phase out natural gas grid*; Available from <https://www.capitaliq.spglobal.com/apisv3/spg-webplatform-core/news/article?id=80102868&redirected=1>.

an alternative energy source, and the feasibility of neighborhood-scale alternative energy projects.

The bill was considered with other legislation in negotiations for the 2025 budget. Ultimately, the provisions listed above did not pass as part of the 2025 budget. However, these proposed changes help show stakeholders and the Commission the direction that NY Governor Hochul believes the state should go in in order to achieve the targets of the CLCPA and ensure the energy transition is just and equitable.

1.4.2. New York Cap-and-Invest Program

The New York Cap-and-Invest Program (“NYCI”) is an economy wide program that will establish a declining cap on annual GHG emissions, while aiming to limit the total cost of carbon mitigation by investing proceeds from compliance in additional programs that will drive further emissions reductions.

The programs will include three main regulatory components:

- 1) the Mandatory Greenhouse Gas Reporting Program Rule;
- 2) the Cap-and-Invest Rule; and
- 3) the Auction Rule.

The New York Department of Environmental Conservation (“DEC”) and New York State Energy Research and Development Authority (“NYSERDA”) are designing the program that will set annual caps on the amount of GHGs covered entities would be permitted to emit. The declining cap will ensure that annual emissions are reduced, ensuring that the state is on a trajectory to meet its GHG emission reduction targets of 40% by 2030, and at least 85% from 1990 levels by 2050.²⁰

The program is currently in the second stage of pre-proposal outreach that is seeking public input that will guide design of the program. The first regulatory component, the Mandatory Greenhouse Gas Reporting Program Rule, will develop a greenhouse gas

²⁰ New York State, *Cap-and-Invest*; available from <https://capandinvest.ny.gov/>.

registry and reporting system. LDCs will be required to measure and report all GHG emissions related to their fuel supplied to customers and operations.

The second regulatory component is the Cap-and-Invest Rule that will identify the entities that will be obligated under the rule (e.g., large-scale GHG emitters). It will also establish GHG emissions allowances (“Allowances”). The Cap-and-Invest Rule will most likely establish the emissions targets that gas utilities will have to comply with in the future.²¹

The third regulatory component is the Auction Rule, which will describe the operation of allowance auctions and mechanisms to protect the integrity of the allowance market.²² This component will create a market for allowances that will allow companies to make decisions regarding emissions compliance using the most cost-effective solutions. For example, this is likely to provide opportunities for companies to address hard or more expensive markets to decarbonize with the option of buying allowances, versus investing in emissions reduction approaches. This may create the opportunity for large companies to comply with their emissions requirements by investing in process efficiency improvements, or carbon capture and sequestration if they are more cost-effective than other approaches, such as commercial electrification.

While the Cap-and-Invest program is in the early stages of development and the development of a robust allowance trading market will take several years, it is important that the Companies thoroughly evaluate the impact the program will have on their long-term gas planning. NYSERDA and the NY DEC recently presented modeling scenarios that estimated potential price ceilings for the cost of carbon.²³ This is the first step in a lengthy process that will allow LDCs to understand NYCI compliance costs.

²¹ New York State, *Cap-and-Invest Rulemaking (6 NYCRR Part 252)*; available from <https://capandinvest.ny.gov/Cap-and-Invest-Rule>.

²² New York State, *Cap-and-Invest Auction Rule*; available from <https://capandinvest.ny.gov/Auction-Rule>.

²³ NY DEC & NYSERDA, *New York Cap-and-Invest Pre-Proposal Stakeholder Outreach: Preliminary Scenario Analyses*, 16. January 2024. <https://capandinvest.ny.gov/-/media/Project/CapInvest/Files/2024-01-26-NYCI-Preproposal-Analysis-Webinar.pdf>.

In their LTP, the Companies have stated that it is too early to quantitatively assess the impacts of the NYCI program. They plan to provide relevant updates in future LTP filings as the Cap-and-Invest program evolves.²⁴

Within a reasonable timeframe after the Commission issues an Order on the Companies' LTP (by their first annual update, latest), the Companies should present sensitivities on NYCI's potential impact to their LTP, including BCA analyses. The Companies should work with the Commission to ensure that they are planning properly and adjusting potential investment decisions based on the impact of the NYCI.

1.5. NYSEG and RG&E Rate Case Settlement

In May 2022, NYSEG and RG&E filed electric and gas rate proceedings with the Commission.²⁵ In June 2023, the Companies, Department Staff and other parties to the rate proceedings filed the Joint Proposal ("JP") with the NY PSC.²⁶ On October 12, 2023, the Commission announced it adopted the terms of the JP.²⁷

The majority of funds allocated through the Rate Order will be used within the electric operations of NYSEG and RG&E. However, significant funding is allocated to gas operations. For example, there will be Gas EE investments of over \$30 million per year for the next three years, funded through rates and the New Efficiency New York ("NENY") program.²⁸ The Rate Order will support gas capital investments over the next three years, with over \$90 million per year allotted to NYSEG and over \$70 million per year allotted to RG&E.²⁹ This money is broken down into categories of asset condition, mandatory, modernization, reliability, and common allocation to gas businesses. The largest of these categories is reliability, which is almost exclusively

²⁴ NYSEG/RG&E, *Final LTP*, 8.

²⁵ See NY PSC Cases 22-E-0317, 22-G-0318, 22-E-0319, and 22-G-0320.

²⁶ NY PSC, *Order Adopting Joint Proposal*. NY PSC Case 22-G-0320. October 12, 2023 ("Rate Order").

²⁷ NY PSC, *PRESS RELEASE: PSC Cuts RG&E, NYSEG's Electric and Gas Rate Request Nearly 50 Percent*. NY PSC Case 22-G-0320. October 12, 2023.

²⁸ NY PSC, *Rate Order*, 49-50.

²⁹ NY PSC, *Rate Order Appendix R*. 4 – 8.

dedicated to leak-prone pipe replacement (“LPPR”). Rate increases for electric and gas customers are compared in Table 1-1 and Table 1-2 below.³⁰

Table 1-1: Percentage Bill Impacts for Electric and Gas Customers

Business	Rate Year 1	Rate Year 2	Rate Year 3
NYSEG Electric	6.6%	7.3%	8.2%
NYSEG Natural Gas	2.0%	2.0%	2.1%
RG&E Electric	5.0%	5.3%	5.7%
RG&E Natural Gas	3.4%	3.6%	3.9%

Table 1-2. Monthly Bill Impacts for Average Residential Electric and Gas Customers

Business	Rate Year 1	Rate Year 2	Rate Year 3
NYSEG Electric	\$9.61	\$8.87	\$11.34
NYSEG Natural Gas	\$3.92	\$2.34	\$3.61
RG&E Electric	\$7.32	\$5.98	\$6.90
RG&E Natural Gas	\$4.50	\$4.32	\$4.30

³⁰ NYSEG, “NYSEG and RG&E, with Multiple Parties, File Proposed Rate Case Settlement with NY Public Service Commission,” Available from <https://www.nyseg.com/w/nyseg-and-rg-e-with-multiple-parties-file-proposed-rate-case-settlement-with-ny-public-service-commission>; accessed November 2, 2023.

1.6. The Long-Term Plan Process and Schedule

As mentioned in Section 1.1, NFG was the first gas utility to file its LTP in New York State. Additionally, on November 29, 2023, Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc. collectively filed their Final LTP as part of Case 23-G-0147.

On December 14, 2023, the Commission released its Order Implementing Long-Term Natural Gas Plan with Modifications, which addresses the NFG LTP (“NFG LTP Order”).

NYSEG and RG&E were identified as LDCs required to file in the second year of the three-year cycle. The Companies filed their Initial LTP on October 2, 2023, their Revised LTP on February 20, 2024, and their Final LTP on April 26, 2024.

CRA is the coordinator for stakeholder involvement in the planning process on behalf of Department of Public Service Staff (“DPS Staff”), as well as a participant in events such as Technical Conferences. In its role, CRA receives all stakeholder data requests and ensures that all data requests are considered and responded to appropriately. CRA also continues to participate in and document Technical Conferences and generally to ensure that any stakeholder who wishes to be involved in the proceedings has a reasonable opportunity to do so.

Please see Table 1-3 for the process schedule. This table includes key filing and comment dates, while Section 2 details project meetings and Technical Conferences.

Table 1-3: NYSEG and RG&E LTP Process Schedule

Date	Event
October 2, 2023	NYSEG/RG&E files their Initial LTP
November 22, 2023	CRA files its Initial Findings Report
December 18, 2023	Initial stakeholder comments due on Initial LTP

January 19, 2024	Reply comments due on Initial LTP
February 20, 2024	NYSEG/RG&E files their Revised LTP
March 15, 2024	CRA files its Preliminary Findings Report
March 29, 2024	Initial stakeholder comments due on Revised LTP ³¹
April 26, 2024	NYSEG/RG&E files their Final LTP
May 21, 2024	CRA files its Final Report
June 14, 2024	Stakeholder comments due on Final LTP*
July 10, 2024	Reply comments due on Final LTP*

*These comment dates are approximate and have not yet been finalized via a NY PSC Secretary's Notice.

1.7. NYSEG and RG&E's Final LTP Filing

Avangrid, the parent company of NYSEG and RG&E, has a stated corporate commitment for reducing GHG emissions. In the Introduction of the Revised LTP, Avangrid provides the details of its Sustainability Development Policy, which was adopted by Avangrid in February 2023. In its 2022 Sustainability Report, Avangrid describes its progress toward fulfilling its corporate-wide goals for achieving carbon neutrality for Scope 1 and 2 emissions by 2030.³² The actions the company has taken across its utility businesses, which includes NYSEG and RG&E, involve efforts to

³¹ The deadline was originally set by the NY PSC Secretary for March 5, 2024. However, it was extended to March 29, 2024 after stakeholders requested an extension.

³² Avangrid, *Avangrid 2022 Sustainability Report*, "Our ESG Goal Scorecard – 2022 Results and 2025/30 Goals," 7.

reduce GHG emissions associated with operating the existing gas infrastructure, and heating and other customer energy requirements, such as:

- Replacement of LPP;³³
- Investments in advanced leak detection and gas capture technologies;
- Connection of renewable natural gas (“RNG”) from farms, wastewater treatment facilities and landfills;
- Investigation of the blending of green hydrogen with natural gas in distribution facilities;
- Facilitation of the adoption of electric heat pumps and other cleaner, less-emissions-intensive heating options as part of a beneficial electrification strategy; and
- Assistance for residential, commercial, industrial, and institutional customers increasing their EE while lowering their energy costs and environmental emissions.³⁴

With this context, the Companies have developed an LTP as required by the Gas Planning Order. In support of their planning, the Companies have developed a list of “Guiding Principles” that they present as consistent with the Gas Planning Order. These six guiding principles are:³⁵

1. Safe Operations
2. Adequate & Reliable Service

³³ NYSEG and RG&E, *Final LTP*, 4. This action was titled “Accelerated replacement of leak-prone pipe” in the Initial LTP, but was altered for the Final LTP because the Companies have agreed to decelerate the rate of leak-prone pipe replacement in their recent rate case as they are nearing the program’s end.

³⁴ Avangrid, *Avangrid 2022 Sustainability Report*, “Our ESG Goal Scorecard – 2022 Results and 2025/30 Goals,” 35.

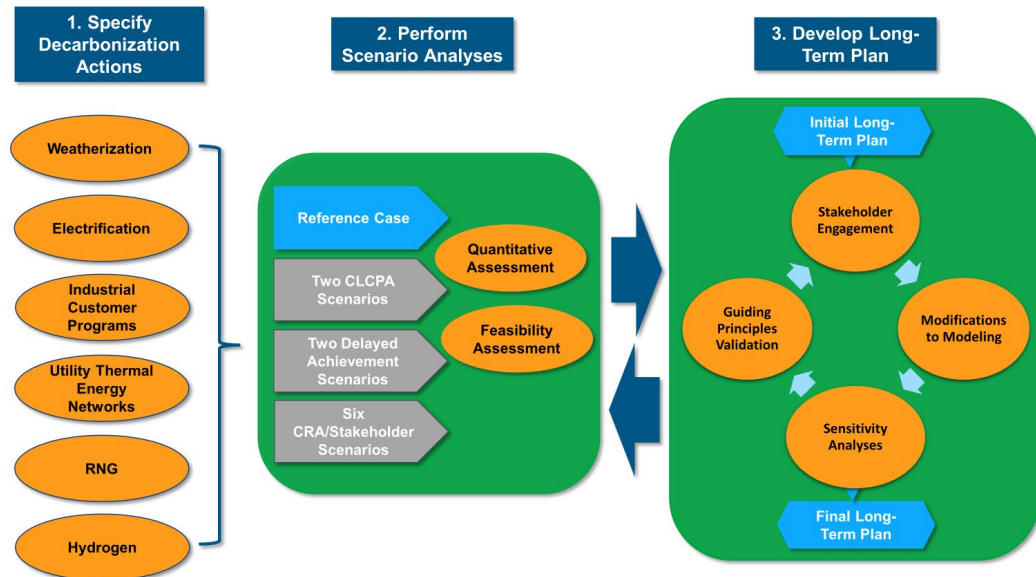
³⁵ NYSEG and RG&E, *Final LTP*, 57.

3. Energy Affordability
4. GHG Emissions Reductions
5. Customer Choice
6. Energy Resilience

It is notable that the Companies have specifically identified “Customer Choice” in their LTP as a guiding principle that will impact end-use equipment and energy decisions in the future. They also identified the related issue that mandates restricting choice are likely to be met with customer opposition, which will be influenced by issues of cost and convenience. While the Companies have noted the importance of customer choice as a factor that will impact the adoption of end-use equipment, they also note in their LTP that they have not attempted to address this issue in their models or the LTP. CRA recommends that in future revisions of its model and LTP, this issue be addressed more directly due to the importance of understanding the relationship between issues of cost, convenience, and customer choice, and the impact it will have on the adoption of various decarbonization measures. In their reply comments, the Companies agree that information on adoption rates would help in the development of more robust results of this modeling but point out the lack of available data at the current time. While CRA agrees that there is a lack of data on the details that will drive customer adoption, it recommends that the Companies include activities in their pilot programs to survey and evaluate these issues further. CRA further addresses this in its comments and recommendations later in this report.

The Companies developed their Final LTP with a set of four scenarios, a methodology described in Chapter V of the LTP. A three-step process is presented in Figure V-2 of the Final LTP and shown below in Figure 1-1.³⁶

³⁶ NYSEG and RG&E, *Final LTP*, 59.

Figure 1-1: Development Methodology of the NYSEG and RG&E Final LTP

The approach uses the six decarbonization actions listed and varies measures in the following four scenarios:

1. CLCPA Full Electrification Scenario
2. CLCPA Hybrid Electrification Scenario
3. Delayed Achievement of Full Electrification Scenario
4. Delayed Achievement of Hybrid Electrification Scenario³⁷

The Companies use the insights they gained from the four scenarios to construct the LTP by selecting varying amounts of the six decarbonization actions. They describe their reasoning for using varying levels of customer adoption for each of the decarbonization actions. Assumptions are provided regarding how much of each of

³⁷ The Companies also include the six Stakeholder-Driven Alternative Scenarios in the Final LTP. Please see section 3.18 for more information.

the decarbonization measures will be required to achieve the results of this scenario, but no detailed discussion is provided on how they will implement these measures.

The Final LTP showed significant changes for the assumptions of cost and relative cost-effectiveness of the various decarbonization measures when compared to the Initial LTP. Using Table D-3 of the Initial LTP Appendix D and Table D-6 of the Final LTP Appendix D, CRA created a table to show a comparison of the differences in assumptions and resulting cost-effectiveness in the Initial LTP and Final LTP for NYSEG. Please see Figure 1-2 below.

Figure 1-2. Comparison of Initial and Final LTP NYSEG Model Outputs

NYSEG LTP	Initial LTP			Final LTP		
	\$/MT CO2e	2043 CO2e (000s MT)	Total Cost NPV (\$M)	\$/MT CO2e	2043 CO2e (000s MT)	Total Cost NPV (\$M)
Reference Case	n/a	4,152	n/a	n/a	4,007	n/a
Weatherization						
Residential: Standard Income	\$ 312	(49)	\$ 39	\$ 33	(199)	\$ 18
Residential: LMI	\$ 780	(107)	\$ 213			
Commercial	\$ 286	(72)	\$ 82	\$ 485	(68)	\$ 121
Municipal	\$ 307	(56)	\$ 68	\$ 485	(53)	\$ 94
Electrification						
Residential	\$ 670	(515)	\$ 1,022	\$ 859	(358)	\$ 830
Commercial	\$ 1,993	(125)	\$ 859	\$ 822	(53)	\$ 140
Municipal	\$ 2,298	(71)	\$ 424	\$ 822	(32)	\$ 86
Industrial						
Process Energy Efficiency	\$ 122	(34)	\$ 19	\$ 243	(33)	\$ 34
Space Heating Electrification	\$ 2,112	(7)	\$ 36	\$ 652	(3)	\$ 4
Carbon Capture	\$ 397	(38)	\$ 32	\$ 404	(18)	\$ 25
Utility Thermal Energy Networks	\$ 1,261	(46)	\$ 194	\$ 8,040	(4)	\$ 48
RNG						
RNG (within Service Territory)	\$ 212	(605)	\$ 695	\$ 212	(605)	\$ 695
RNG (outside NY)	\$ 231	(190)	\$ 278	\$ 231	(190)	\$ 278
Hydrogen Enriched Natural Gas	\$ 194	(174)	\$ 135	\$ 193	(182)	\$ 139
Scenario Total	\$ 475	2,063		\$ 330	2,210	
Change from Ref Case	n/a	(2,089)	\$ 4,095	n/a	(1,797)	\$ 2,512
% Change from Ref Case		-50%			-45%	
% Change from 1990 Level		-58%			-55%	

CRA submitted a data request to better understand the drivers of these changes. Please see LTGP-23-195 and LTGP-23-196 in the Appendix.

Additionally, as per CRA's recommendation, the Companies have provided a list of changes made as a result of stakeholder feedback. Please see Chapter V, Section C of the Final LTP.

Table 1-4 below presents a summary of some of the key results of the Reference Case, the Scenarios, and the Revised LTP. This includes the percent emissions reduction in 2030 and 2043 compared to 1990, and average residential customer bills in 2043 for each case.³⁸

Table 1-4: Results Matrix

Scenario	2030 GHG Emissions Reduction (% below 1990)	2043 GHG Emissions Reduction (% below 1990)	2043 Affordability (Typical residential gas bill - \$/mo.)
NYSEG			
Long-Term Plan	-24%	-55%	\$284
CLCPA Full-Electrification Scenario	-25%	-65%	\$433
CLCPA Hybrid Scenario	-26%	-65%	\$386
Delayed Full-Electrification	-21%	-50%	\$287

³⁸ NYSEG and RG&E, *Final LTP*, 86-87, 91-92. This data was also derived from *Revised LTP* Appendix D: D-7 – D-15, D-20, D-54 – D-64, D-67.,

Delayed Hybrid	-22%	-50%	\$272
RG&E			
Long-Term Plan	-24%	-50%	\$205
CLCPA Full-Electrification	-25%	-65%	\$342
CLCPA Hybrid Scenario	-28%	-65%	\$299
Delayed Full-Electrification	-21%	-50%	\$232
Delayed Hybrid	-24%	-50%	\$208

In their discussion of the LTP Guiding Principles, the Companies reference the recent Rate Order, which includes provisions that relate to their LTP and the objectives of the CLCPA. These provisions include specific program enhancements, pilots, and investments that are listed in Chapter VII of the LTP. This list includes several actions that the Companies referenced as having been included in the JP.³⁹ In an update from their Initial LTP, the Companies did include further discussion of the way these listed items relate to the LTP in their Revised and Final LTPs.⁴⁰

³⁹ NYSEG and RG&E, *Final LTP*, 119.

⁴⁰ *Id.*, 119 – 123.

1.8. The Final Report

This Final Report provides an assessment of the Companies' Final LTP and CRA's view on how the LTP might be improved in order to meet the overall objectives of the Gas Planning Order.

This Report is organized into four sections:

- Introduction
- The Process to Date
- Assessment of the Revised Long-Term Plan
- Conclusion

The "Assessment of the Revised Long-Term Plan" section contains CRA's assessment of the Companies' LTP. The Report was approached with an emphasis on the reasonableness of assumptions and inputs supporting the LTP. It also reflects and documents the stakeholder feedback that has been submitted to date.

As stated in the Executive Summary, this Report may not consider all written stakeholder feedback or the Companies' responses to data requests received after May 15, 2024.

CRA acknowledges that the NYSEG/RG&E Final LTP was filed prior to this Final Report. Unless otherwise stated, for the recommendations provided in this report, CRA is recommending the Commission require the Companies to modify their Final LTP accordingly.

All written stakeholder feedback referenced in this report can be found in the NY PSC docket for Case 23-G-0437.⁴¹

⁴¹ NY PSC Case 23-G-0437 can be accessed at <https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=23-g-0437&CaseSearch=Search>.

2. The Process to Date

A summary of key events, meetings, and Technical Conferences through May 1, 2024 can be found below.

Table 2-1. Summary of Key Events During the Long-Term Planning Process

Date	Event
September 13, 2023	To initiate the long-term planning process, the Companies hosted an Informational Session. The presentation may be found on NYSEG's website. ⁴²
October 2, 2023	The Companies filed their Initial LTP. The plan was submitted in three documents (The Executive Summary, The Initial Long-Term Plan, and Appendices). The documents can be found within the applicable docket and the Companies' websites. ⁴³
October 11, 2023	The Companies, CRA, and Staff met to discuss and finalize the project schedule.
November 21, 2023	The Companies, CRA, and Staff met to discuss and review the Companies' decarbonization model.
November 22, 2023	CRA filed its Initial Findings Report.

⁴² NYSEG, *Gas Long Term Plan, Stakeholder Information Session Presentation*. Available from <https://www.nyseg.com/ourcompany/reliableservice/reliability-projects/gas-long-term-plan>. September 13, 2023.

⁴³ *Ibid.*

November 29, 2023	Staff hosted a Technical Conference for the Companies to introduce their LTP to stakeholders. ⁴⁴
November 29, 2023	IBEW Local 10 and Local 36 posted Public Comments in the docket.
December 8, 2023	The Companies, CRA, Staff, and representatives on behalf of Strategen, Earthjustice, and the Sierra Club met to discuss the confidentiality of Companies' information.
December 11, 2023	Jeff Schumann posted Public Comments in the docket.
December 13, 2023	Staff hosted a Technical Conference for the Companies to present their electrification plan and assumptions to Stakeholders.
December 18, 2023	Stakeholder comments responding to NYSEG/RG&E's Initial LTP were due. The Stakeholders who submitted comments were Sierra Club and Earthjustice("SC/EJ"), Strategen (on behalf of SC/EJ), Alliance for a Green Economy ("AGREE"), Multiple Intervenors, and the Tompkins County Department of Planning & Sustainability.

⁴⁴ Notes from all Technical Conferences can be found on the project SharePoint.

January 4, 2024	Staff hosted a Technical Conference for the Companies to discuss MAOP issues, Hydraulic Modeling, and Vulnerable Areas with Stakeholders.
January 18, 2024	Staff hosted a Technical Conference for the Companies to discuss NPAs (both generally and specific to Lansing, New York, and Canandaigua, New York) with Stakeholders.
January 23, 2024	Staff, CRA, and the Companies met to discuss the Companies' hydraulic models. ⁴⁵
January 23, 2024	Staff hosted a meeting for CRA to present its suggested Stakeholder-Driven Scenarios. See Section 3.18 for more information.
January 25, 2024	Staff hosted a Technical Conference for the Companies to present their electric and gas price forecasting assumptions to Stakeholders. CRA also presented an update to their suggested Stakeholder-Driven Scenarios at this meeting.
January 30, 2024	Staff, CRA, and the Companies had a follow-up meeting to discuss the Companies' hydraulic models.
January 31, 2024	Staff hosted a Technical Conference for representatives from New York Geothermal Energy Organization ("NY-

⁴⁵ CRA also had representation from Rod Walker & Associates working on its behalf at the Hydraulic Modeling meetings.

	GEO”) to discuss geothermal heat pump technology with stakeholders.
February 4, 2024	NY-GEO posted Public Comments in the docket.
February 13, 2024	Staff hosted a Technical Conference for representatives from Fossil Free Tompkins and Tompkins County to discuss potential gas system decommissioning with stakeholders.
February 16, 2024	The Companies filed their Revised LTP. The plan was submitted in three documents (The Executive Summary, The Revised Long-Term Plan, and Appendices). The documents can be found within the applicable docket and the Companies’ websites. ⁴⁶
February 28, 2024	Staff hosted a Technical Conference for the Companies to present information related to customer bills and affordability.
March 14, 2024	CRA filed its Preliminary Findings Report.
March 25, 2024	Staff, CRA, and the Companies met to discuss CRA’s eighth data request and additional stakeholder-driven scenarios.

⁴⁶ NYSEG and RG&E, *Revised LTP, Executive Summary and Appendices*; Available from <https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=23-G-0437>.

March 29, 2024	Stakeholder comments responding to NYSEG/RG&E's Revised LTP were due. Comments were filed by NY-GEO, AGREE, SC/EJ, NYSERDA, and Fossil Free Tompkins.
April 26, 2024	The Companies filed their Final LTP. The plan was submitted in three documents (The Executive Summary, The Final Long-Term Plan, and Appendices). The documents can be found within the applicable docket and the Companies' websites. ⁴⁷
May 21, 2024	CRA filed its Final Report.

Data requests ("DRs") issued through May 1, 2024, are outlined in Table 2-1 below. Stakeholder DRs to NYSEG/RG&E are first sent to CRA as the manager of the Stakeholder process. All responses to the data requests noted in Table 2-1 can be found on the SharePoint site.

Table 2-2: Data Request Activity

Date Issued	Issuing Party	DR Number	Response Submitted
Sep. 12, 2023	CRA	1	Oct. 10
Oct. 18, 2023	CRA	2	Nov. 1
Nov. 6, 2023	CRA	3	Nov. 20

⁴⁷ NYSEG and RG&E, *Final LTP, Executive Summary and Appendices*; Available from <https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=23-G-0437>.

Nov. 8, 2023	SC/EJ	1	Nov. 17
Nov. 20, 2023	SC/EJ	2	Dec. 4
Nov. 27, 2023	NYSERDA	1	Dec. 11
Nov. 30, 2023	NYSERDA	2	Dec. 11
Dec. 5, 2023	SC/EJ	3	Dec. 11
Jan. 11, 2024	CRA	4	Jan. 25, 2024
Feb. 9, 2024	CRA	5	Feb. 23, 2024
Feb. 13, 2024	NYSERDA	3	Feb. 26, 2024
Feb. 20, 2024	CRA	6	Mar. 5, 2024
Mar. 1, 2024	SC/EJ	4	Mar. 5, 2024
Mar. 7, 2024	CRA	7	Mar. 21, 2024
Mar. 19, 2024	CRA	8	Apr. 12, 2024
Apr. 8, 2024	CRA	9	Apr. 22, 2024
Apr. 24, 2024	CRA	10	April 29, 2024
May 1, 2024	CRA	11	May 13, 2024

3. Assessment of the Revised Long-Term Plan

3.1. Reliability

3.1.1. Background

A central requirement of any LTP is that safety and reliability be either maintained or improved over time. Safety and reliability should never be compromised. Reliability is achieved by providing adequate capacity and gas supply to all firm customers every day of the year, regardless of weather.

LDCs use various metrics to measure reliability, and they are a valuable tool to assist in gas system planning and investment decisions.

Peak gas demand occurs during the coldest days of winter because many people rely on natural gas for heating in New York. The design planning criteria focuses on maintaining necessary supply and delivery capability to meet the design day gas requirements of customers during peak demand events. Inadequate supply and pressure could lead to an outage, which could be severe and could even harm property or lives. For this reason, reliability is a critical factor in gas system planning. As stated by the Companies:

An unplanned natural gas outage is a major event with restoration requiring multiple visits to each home and business affected for shutoff, inspection, and relighting. Recovery from such events is a labor-intensive, time-consuming process that can last weeks.⁴⁸

Correspondingly, securing adequate gas supply resources, including contracted pipeline and storage capacity, to meet peak demand of customers is required. Given that NYSEG relies on Compressed Natural Gas (“CNG”) to meet design day needs, reliability risks associated with CNG need to be evaluated before they are incorporated into the LDC’s supply-side resources for meeting design day needs.⁴⁹ RNG could

⁴⁸ NYSEG and RG&E, “Supply and Demand Analysis Related to Service Areas with Known Supply Constraint Vulnerabilities,” Case 20-G-0131, July 17, 2020, 5 – 6.

⁴⁹ *Id.*, 6.

become an increasing source of gas supply for LDCs and as a result, the reliability risks associated with its availability on the design day must be evaluated.

The impacts of climate change and other triggering events could affect deliveries to and across the Companies' gas transmission and distribution system, potentially impacting reliability. Reliability concerns during storms and cold weather could also impact upstream gas supply sources (production and storage well freeze offs) and pipeline compressor availability, which could in turn impact pipeline delivery pressures.

An LDC must also proactively manage its interruptible customers to ensure they comply with notifications to cease burning gas, as it is critical to maintain reliability to firm gas customers. Demand management of dual-fuel firm customers can also be important to address localized system issues.

The identification of risks associated with potential vulnerabilities caused by a shortage of pipeline capacity serving an area, a distribution infrastructure issue, increases in localized demand growth, or an over-reliance on third-party capacity must be continuously evaluated.⁵⁰

Distribution systems need to be designed to transport gas while maintaining adequate pressures during periods of high demand to meet peak day/peak hour design conditions safely and reliably.⁵¹

3.1.2. Stakeholder & Company Feedback

Strategen adds that the Companies "continue to model new capital infrastructure investments in all scenarios beyond those necessary for safety and reliability."⁵² Multiple

⁵⁰ NYSEG and RG&E, "Supply and Demand Analysis Order 3, Redacted." 5. Case 20-G-0131. July 17, 2020.

⁵¹ *Ibid.*

⁵² Strategen, *Comments on the Initial LTP*, 20.

Intervenors stress that they depend on reliable gas service, and its members would consider relocating if that were compromised.⁵³

In their comments on the Revised LTP, NYSERDA introduces a 2020 Pipeline and Hazardous Materials Safety Administration rule (“PHMSA”): “PHMSA promulgated a rule (effective on July 1, 2020) requiring reconfirmation by 2035 of the maximum allowable operating pressure (“MAOP”) of all gas transmission pipeline segments that do not have traceable, verifiable, and complete records.”⁵⁴

NYSERDA then points out that “the Companies [have not] established a system to determine which reconfirmation method is most suitable and cost-effective for compliance [and] it will be necessary for the Companies to develop a robust forecast of spending required for MAOP reconfirmation.” They opine “It will be necessary for the Companies to develop a robust forecast of spending required for MAOP reconfirmation.”⁵⁵

3.1.3. Findings

The Gas Planning Order recommends that the LTP filing identify the methodology and metrics to be used to forecast and measure reliability and identify potential future reliability issues.⁵⁶

The Companies have a proactive leak-prone main (“LPM”) replacement program to ensure safety and reliability since these pipes degrade over time. Leak repairs address an issue that can reoccur. The program is almost complete, as no cast iron mains

⁵³ Multiple Intervenors, *Comments on the Initial LTP*, 2.

⁵⁴ 49CFR§§191,192:<https://www.federalregister.gov/documents/2019/10/01/2019-20306/pipeline-safety-safety-of-gas-transmission-pipelines-maop-reconfirmation-expansion-of-assessment>

⁵⁵ NYSEKDA, Comments on Revised LTP, 3-4

⁵⁶ NY PSC, *Gas Planning Order*, 34.

remain in their distribution systems, and 100% of wrought iron and bare steel gas mains will be replaced by 2030.^{57,58}

Both NYSEG and RG&E have gas transmission pipelines with established MAOPs that fall within the requirements of the PHMSA final rule. A reconfirmation of the MAOP of all gas transmission pipeline segments that do not have traceable, verifiable, and complete (TVC) records is required. The rule offers six reconfirmation compliance methods: pressure test, pressure reduction, engineering critical assessment, pipe replacement, pressure reduction for pipeline segments with small potential impact radius, and alternative technology.⁵⁹

This rule is intended to enhance the level of safety associated with the transportation of gas and address the causes of several recent incidents (including the Pacific Gas and Electric San Bruno incident) by clarifying and enhancing existing records and requirements.

In response to LTP-23-208, the Companies stated their current position on the PHMSA rule: "Due to the complexity and breadth of the newly established PHMSA Regulations, the Companies are in the preliminary stages of planning for evaluation of MAOP confirmation and TVC records identification and have not developed any specific plans and/or projected capital investment associated with the PHMSA ruling which requires compliance by 2035. The Company estimates that the earliest approximate date for which detailed plans and or identified capital projects may be established is calendar year 2028."⁶⁰

3.1.4. Recommendations

In its Initial Findings Report, CRA recommended that in the Revised LTP, the Companies include additional metrics related to reliability and methodologies to be

⁵⁷ NYSEG and RG&E, *Final LTP*, 34.

⁵⁸ The Final LTP Appendix E Tables E-13 and E-14 also show that all leak-prone services will be replaced by 2036.

⁵⁹ 49CFR§§191,192:<https://www.federalregister.gov/documents/2019/10/01/2019-20306/pipeline-safety-safety-of-gas-transmission-pipelines-maop-reconfirmation-expansion-of-assessment>

⁶⁰ NYSEG and RG&E Response to LTP-23-208, April 22, 204

used to forecast, measure, and identify potential future reliability issues. In the Revised LTP, the Companies added a discussion of metrics identified in their JP that apply to the LPM Replacement Program.⁶¹ These include Leak Backlog Management, Emergency Response, Gas Safety Violations, and Damage Prevention.⁶² These metrics are also included in the Final LTP on page 32.

CRA recommends that the Companies develop a comprehensive compliance plan that identifies and justifies which MAOP reconfirmation method is most suitable, technically feasible, and cost-effective. The plan should provide detail at the segment/project level for transmission pipe for each impacted year of the LTP. In addition, detailed plans should be provided in any updates to the LTP, including capital plans and any evaluations for potential NPAs solutions. Status reports should be included in the Companies' Annual LTP updates and incorporated in the Companies next LTP submission to inform stakeholders of potential impacts and tradeoffs.

Design Day Standards

Meeting the design day's forecasted demand is a critical requirement for the Companies LTP since the cold weather experienced in NYSEG's and RG&E's service territory could threaten public safety if gas service is not available for space heating.

In the Gas Planning Order, the Commission addresses a Staff proposal to consider design day standards for the Companies' LTPs and revalidate them at intervals proposed by the Companies.⁶³

The first consideration of design day planning evaluated is the design weather pattern. NYSEG's design weather pattern utilizes weather data for several NYSEG load areas, while RG&E uses a single load area.⁶⁴ NYSEG provides gas service to customers that are geographically dispersed across upstate New York, while RG&E provides gas

⁶¹ NYSEG and RG&E, *Revised LTP*, 30.

⁶² *Id.*, 33.

⁶³ NY PSC, *Gas Planning Order*, 34.

⁶⁴ NYSEG and RG&E, *Final LTP*, 24; NYSEG/RG&E Response to LTGP-23-005.

service to customers primarily in the metro-Rochester area.⁶⁵ The Companies utilize an average daily temperature reference of 65 degrees to determine the associated heating degree day (“HDD”). Please see Table 3-1 for the various HDDs the Companies used in their gas system planning process.⁶⁶

Table 3-1: HDDs by Location and Company

Company	Location	HDD	Average °F Daily Temperature
NYSEG	Binghamton/Olean	75	-10
NYSEG	Lockport	74	-9
NYSEG	Brewster/Goshen	71	-6
NYSEG	Lowville/Plattsburgh	85	-20
RG&E	Entire Service Area	75	-10

The second consideration is whether the analysis performed was sufficient for determining the design day demand that is used for each operating area.

The Companies’ responses provided to CRA’s initial data requests, responses LTGP-23-005 and LTGP-23-006, that explained their methodology for conducting a variety

⁶⁵ *Ibid.*

⁶⁶ Temperature conversion column was added by CRA to Final LTP, Reference Case Table III-3, Design Day HDD, 43.

of analyses to validate design day demand for each operating area, are provided below:

1. *Design day analysis evaluation is based upon regression analyses performed on actual winter month usage and associated Heating Degree Days (HDDs) to determine base and heat factors and an associated design day load estimate.*
2. *Extrapolation is performed utilizing the heat factor calculated above. For each day within the previous December through February, the heat factor is multiplied by the difference between the design day HDD and the actual HDD experienced, and then added to the actual metered load experienced on the same day. This analysis provides an estimate of what the actual load would have been had the same load patterns taken place under design weather conditions. Then the average, maximum and minimum extrapolated design loads are calculated for the December through February period.*
3. *For the months of December through February, total non-daily metered winter heat load is divided by the total HDDs experienced, multiplied by the design day HDD, and added to the base factor determined above to provide a third demand estimate.*

Design day forecast must be confirmed on a regular basis by using actual cold day system sendout and extrapolating the demand for firm gas customers up to the design day HDD for each of the planning areas. This should be done annually to allow for differences in efficiencies, new end uses, and consumer behavior to be incorporated into the analysis.

The Companies provided a five-year forecast that is utilized to develop the LTP Reference case that includes peak day, winter, and annual demand under both design and normal weather HDDs. This analysis is utilized for winter supply plan, capacity planning, and procurement. This is submitted to the Commission and updated prior to and through the winter season. Included in the forecast is a comparison of the prior

winter's forecast peak day and the actual peak day experienced, adjusted for design day HDD for each planning area.⁶⁷

In response to LTGP-23-005, the Companies indicated that the weather analysis is updated annually to capture the most recent 40 years of data. The Companies incorporated a dynamic analysis several years ago, utilizing the most recent 40-years of data, to develop updated design and normal year usage calculations.

The Companies also provided a confidential study conducted by Marquette Energy Data Analytics ("MEA") that compares the results of MEA's analysis to the methodology employed by the Companies.⁶⁸

From a planning perspective, there is no consensus within the natural gas industry as to the single best approach for a design day HDD standard. Through their Gas Supply department, the Companies have discussed this subject with MEA as well. MEA's recommendation, based on its research, is that design day HDDs should not be lowered based on the latest 40 years of data. Based on the various industry approaches and MEA's recommendation, NYSEG and RG&E plan to continue to increase the design day HDD should a new peak HDD occur in the current 40-year weather data sample; however, the design day HDD is not anticipated to be lowered. The Design Winter utilizes the rule curve methodology to establish the highest set of HDDs over the previous 40-year period.⁶⁹

The Companies response to LTGP-23-061, Attachment 3 provides the supporting HDD data and analysis performed for the development of the Design Winter season that the Companies utilize for planning. This analysis is updated annually to incorporate the most recent daily HDDs from the prior winter season for inclusion in the updated 40-year (currently, 1983 through 2023) data set. The rule curve methodology is used to determine the maximum exposure in HDDs that has been

⁶⁷ NYSEG and RG&E, *2023-2024 Winter Supply Plan*, July 19, 2023 and September 1, 2023 Update. Case 23-M-0230.

⁶⁸ MEA, *Analytics Design Study*, Confidential Attachment 1, May 2023.

⁶⁹ NYSEG and RG&E, *2023-2024 Winter Plan*, Case 23-M-0230, July 19, 2023.

observed for the winter season in a service area over a 40-year historical period and is also utilized by the Companies to inform supply planning for extreme and extended cold weather conditions.⁷⁰

In its LTP, the Companies indicated that: (1) their design day weather is based on the coldest weather experienced historically that dates back to February 1979; (2) an analysis is performed to determine if a new coldest day has occurred that would change the design day weather for future years; and, (3) they incorporate current information about customer usage.⁷¹

Long-Term Plan Design Day Methodology

The Reference Case design day demand is forecasted by applying annual growth from the annual demand forecast. The 2024 forecast is based on the Companies' July 2023 Winter Supply Plan, which reflects this information forecasted for the 2023/2024 Winter Season. The Final LTP incorporates assumption changes in the Companies' Reference Case design day demand⁷². As shown in Table 3-2, Reference Case design day demand is expected to decline over time for both NYSEG and RG&E.⁷³

Table 3-2: NYSEG and RG&E Reference Case Design Day Demand (Dth)

NYSEG				RG&E		
	2024	2043	CAGR	2024	2043	CAGR
Total	456,944	401,119	-0.68%	506,391	475,830	-0.33%

The Final LTP Appendix D includes Tables D-24 and D-69 that show the Annual design day 20-year forecasts for NYSEG and RG&E, respectively, in Mcf/day that is used in the LTP modeling, for the Reference Case and each of the scenarios.

⁷⁰ NYSEG and RG&E, Response to LTGP-23-061.

⁷¹ NYSEG and RG&E, *Final LTP*, 42.

⁷² NYSEG & RG&E, *Final LTP*, 40-41

⁷³ *Id.*, 43.

3.1.5. Stakeholder & Company Feedback

SC/EJ believe the Companies' calculation for peak heating demand is flawed, noting the Companies used low temperatures not experienced in over 40 years. "Overstating the maximum HDD has the effect of making gas appear relatively more beneficial than electrification as heat pumps become less efficient and more costly to operate at the temperatures the Companies assume."⁷⁴

SC/EJ describe their concern as follows, noting that the Companies:

... inflate projected heating needs by failing to follow their own proposed methodology for calculating peak heating demand. As CRA points out, the Companies claim to project peak heating needs based on the coldest day in the prior 40 years. However, the Companies rely on temperatures that have not occurred in the Companies' service territory in more than 40 years, thereby inflating projected heating demand...The Companies must rerun their modeling to incorporate maximum HDDs that reflect their one in 40 methodology⁷⁵

The Companies agree with CRA on certain aspects of design day planning, citing CRA's positions that "meeting design day's forecasted demand is a critical requirement for the Companies' LTP" and "design day forecast must be confirmed on a regular basis." However, they disagree with CRA, and SC/EJ comments that the Companies project peak heating needs based on a "one in 40 methodology," which drives a design day based on the last 40 years of historical weather data. The Companies state that their "design day weather is based on the coldest weather experienced historically," including temperatures going back at least 60 years.

The Companies further disagree with SC/EJ's assertion that "their design day forecast, which relies on cold weather that occurred up to 45 years ago, inflates projected heating demand." The Companies assert that it would be irresponsible to plan for a less extreme design day, which would possibly jeopardize safety and reliability. They cite the NFG LTP Order, which states "The Commission recognizes that progress toward decarbonization will take time and must be done with care to ensure that

⁷⁴ Sierra Club and Earthjustice, *Comments on the Initial LTP*, 21.

⁷⁵ *Ibid.*

customers continue to have access to safe, adequate, and reliable gas service as allowed under the State's laws." The Companies state that it would be irresponsible to change their design day forecasts to plan for a less extreme design day, and plan to keep their design day forecast the same in the Revised LTP.

In their comments on the Revised LTP, NYSERDA states that the Companies' approach to design day planning is asymmetrical, as they will consider lowering their design day temperatures if colder temperatures occur but will not consider increasing them. NYSERDA agrees with CRA's statement that "the consideration of longer-term climate change patterns is appropriate in the development of the design winter planning criteria and design day standards." New York State recently released the technical chapters of its Climate Impact Assessment. on long term weather forecast, which indicates fewer extreme cold days in the Companies' service territories in the future.⁷⁶ NYSERDA asserts that the Companies' design day planning could overstate gas system requirements and result in extra costs to customers. "NYSERDA recommends that the Companies work with the PSC and potentially other utilities in the state to develop a framework for updating their definition of design day demand conditions to align with empirical data and the latest climate science."⁷⁷

3.1.6. Findings

Design Day Standards

The Companies' Winter Supply Planning methodology is consistent with the approaches other LDCs use to meet design day demand.

The Companies' clarified in their reply comments that the design day weather is based on the coldest weather experienced historically for seven NYSEG load areas, while RG&E is a single load area. The Companies incorporate localized weather patterns

⁷⁶ Lamie, C., Bader, D., Graziano, K., Horton, R. John, K., O'Hern, N., & Spungin, S. (2024). Chapter 2: New York State's changing climate. In New York State Climate Impacts Assessment [Interim version for public release].

⁷⁷ NYSERDA, *Comments on the Revised LTP*, 7-9.

since the data is available for planning based on the corresponding weather reporting stations that represent the geographically dispersed service areas and differences in temperature data across upstate New York. The Companies have stated that their current practice does not base their design day weather on the most recent 40 years of history but rather the coldest weather experienced historically. Currently, the coldest days date back as far as February 1979, or 45 years.⁷⁸

In LTGP-23-061, the Companies provided a table showing a ranking of the coldest daily temperature for each year over the last 40 years. In LTGP-23-005, the Companies' stated that their forecast methodology is updated annually to incorporate the most recent 40 years of observed weather data (bolded for emphasis):

*NYSEG and RG&E incorporated a dynamic analysis several years ago, utilizing the most recent 40 years of data, to develop updated design and normal usage degree day calculations. **The weather analysis is updated annually to capture the most recent 40 years of data. NYSEG and RG&E plan to continue to increase the design day HDD should a new peak HDD occur in the current 40-year weather data; however, the design day HDD is not anticipated to be lowered.** The Design Winter utilizes the rule curve methodology to establish the highest set of HDDs over the previous 40-year period.*⁷⁹

The Companies provided their current planning criteria in response to LTGP-23-061, which can be seen as Table 3-3. CRA's analysis of this response shows that the Companies are currently utilizing the coldest daily temperature and HDD results from years prior to the current 40-year period (1983/1984 through 2022/2023) for the entire RG&E system and several of NYSEG supply planning pooling areas.⁸⁰ Please see Table 3-4 for the values of HDD from the current 40-year period.⁸¹

⁷⁸ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 14.

⁷⁹ NYSEG RG&E, Response to LTGP-23-005, 3.

⁸⁰ NYSEG RG&E, Response LTGP-23-061, Attachments 1 & 2.

⁸¹ *Ibid.*

Table 3-3: NYSEG and RG&E Current Planning HDD Criteria

Area	Max HDD (at least 1 in 40)	Daily Average Temp	Date Observed
NYSEG Total	75	-10	1/19/1994
Binghamton / Olean	75	-10	1/19/1994
Brewster	71	-6	1/14/2004
Goshen	71	-6	1/14/2004
Lockport	74	-9	1/17/1982
Lowville	85	-20	1/4/1981
Plattsburgh	85	-20	1/4/1981
Rochester	75	-10	2/17/1979

Table 3-4: Adjusted HDD Criteria for Current 40-Year Period

Area	Max HDD (at least 1 in 40)	Daily Average Temp	Date Observed
NYSEG Total	75	-10	1/19/1994
Binghamton / Olean	75	-10	1/19/1994
Brewster	71	-6	1/14/2004
Goshen	71	-6	1/14/2004
Lockport	71	-6	2014 - 2015
Lowville	78	-13	2003 - 2004
Plattsburgh	78	-13	2003 - 2004
Rochester	70	-5	1993 - 1994

An analysis is conducted after each winter to determine whether a new coldest day has occurred that would change the design day weather for future years.⁸²

NYSEG and RG&E addressed these issues in their Reply Comments as follows:

The Companies' agree with CRA's assessment that "[m]eeting the design day's forecasted demand is a critical requirement for the Companies LTP since

⁸² NYSEG and RG&E, *Reply Comments on the Initial LTP*, 14.

the cold weather experienced in NYSEG's and RG&E's service territory could threaten public safety if gas service is not available for space heating."

The Companies also agree with CRA that the "[d]esign day forecast must be confirmed on a regular basis by using actual cold day system sendout and extrapolating the demand for firm gas customers up to the design day HDD for each of the planning areas. This should be done annually to allow for differences in efficiencies, new end uses, and consumer behavior to be incorporated into the analysis."

The Companies review and update their design day demand forecast annually for exactly these reasons, and will continue to do so, as the design day forecast is a critical component for capacity, supply, and distribution system planning.

However, both CRA and SC/EJ note concerns with the level of HDDs that the Companies use in their design day forecasting process. CRA correctly states that "there is no consensus within the natural gas industry as to the single best approach for a design day HDD standard," but states that there are some load areas for which the Companies are using design day HDD based on weather that occurred outside the most recent 40-year period.⁸³

The Companies maintained the existing Reference Case design day forecast in the Final LTP, and, consistent with many other assumptions, will update the design day forecast and use per customer in future LTPs as more information becomes available.

Long-Term Plan Design Day Methodology

Design day demand is forecasted by applying a change in demand from the annual demand forecast to the estimated design day demand for 2024 for NYSEG and RG&E.⁸⁴ The design day demand forecast is presented in Table E-3 of the Final LTP. The 2024 forecast was converted from dth/day to MMcf/day by utilizing the 1.03 British thermal unit ("BTU") conversion factor specified in the LTP.⁸⁵

⁸³ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 13 – 14.

⁸⁴ NYSEG RG&E, *Final LTP Appendix E*, E-6.

⁸⁵ NYSEG and RG&E, *Final LTP Appendix A*, Table A-1.

The Companies provided an update on September 1, 2023, to the 2023-2024 Winter Supply Plan they submitted to the NY PSC that lowered the annual Design Day Demand used for the LTP Reference Case for years 2025 through 2028. The 2024 forecasts remained unchanged. The Companies state the reasons for these updates are as follows:

. . . Companies are seeing a slightly lower use per customer due to increasing appliance efficiency. This comes as households and businesses replace gas water heaters and other gas appliances every 8-10 years and furnaces every 25-30 years. With all of these attributing factors, the Companies have to “grow” customer counts by a certain amount each year just to offset this embedded efficiency gain. The energy efficiency programs are included in the forecast. The forecasts are not easily referenced in the rate case because the Companies have updated their forecasts to reflect more recent economic data and more recent billing history in their models. [Energy Efficiency Portfolio Standard] (“EEPS”) numbers are the same as in the rate case Workpapers that were provided. The forecasted EEPS numbers from the rate case are now changed to actuals for the appropriate time period.⁸⁶

Over the 20-year forecast period through 2043, the attributing factors described above from the LTP forecast could result in a lower design day demand and impact annual gas demand in the Reference Case. The other LTP scenarios developed based on changes to Reference Case assumptions would also be impacted. In addition, the other factors described should also be considered and incorporated.

In the Final LTP, the Companies’ indicated that their existing gas energy efficiency rebate programs have had measurable impacts on customer usage. They further explained:

The Companies’ existing gas energy efficiency rebate programs have had measurable impacts on customer usage and historically the Companies’ gas demand forecasts have been adjusted to account for reductions in annual demand expected from energy efficiency measures accumulating in the future. However, as discussed above, many existing gas energy efficiency programs are being eliminated.

⁸⁶ NYSEG and RG&E, *Winter Supply Plan – Case 23-M-0230*, September 2023, Update.

Therefore, the Reference Case residential forecast contains an energy efficiency adjustment for only 2025 and reflects the elimination of all residential rebates for efficient gas equipment starting in 2026. The Reference Case commercial forecast contains a full energy efficiency adjustment for 2025 and a reduced energy efficiency adjustment after 2025 to reflect the elimination of rebates for gas cooking equipment. The energy efficiency adjustment to the Reference Case does not include adjustments for programs targeting building envelope improvements as these will be considered as part of the LTP as discussed below.⁸⁷

3.1.7. Recommendations

The Companies should further discuss the impact of the residential energy efficiency adjustment to the Reference Case and its impact on the LTP design day demand forecasts. The assumption changes included in the *NYSEG and RG&E Winter Supply Plan – Case 23-M-0230, September 1, 2023, Update* should be incorporated in updates to the LTP design day demand forecasts. The methodology utilized to forecast design day demand, including the calculation of use per customer and how it changes over time, should be reviewed and revised to incorporate any changes necessary into the LTP utilizing the most recent analysis and information.

It is reasonable that the Companies incorporate localized weather patterns for planning as the data is readily available and verifiable from an independent source based on the geographically dispersed service areas that reflect the differences in temperature data across the service areas.

It is also reasonable that the Companies' forecast methodology incorporates weather analysis that is updated annually to capture the most recent 40 years of data allowing changes in climate patterns to be incorporated.

These forecasted peak-day design conditions, utilized for both gas supply portfolio planning and infrastructure planning to serve customers, are foundational to the LTP being evaluated. CRA believes that the consideration of longer-term climate change patterns is appropriate in the development of the design winter planning criteria and

⁸⁷ NYSEG and RG&E, *Final LTP*, 40 – 41.

design day standards as part of its LTP development. The Companies should investigate the impact of incorporating these temperature trends and discuss the tradeoffs as part of the ongoing LTP process. In addition, the Companies should inform stakeholders of the potential implications of these tradeoffs.

Recent NYSEG & RG&E Climate Change Vulnerability Study projections show the potential for warmer winters and less extreme winter cold snaps.⁸⁸ The study notes that the frequency of ice storms and cold snaps may decrease in the future, but changes in the intensity are less certain.⁸⁹

New York State recently released the technical chapters of its Climate Impact Assessment.⁹⁰ Chapter 2 provides in-depth observations and projected impacts of climate change, including projections of the frequency of extreme weather events through the 2080s across the state. The study shows that the annual number of days below 0°F and days below 32°F are projected to decrease across the state over time, including at weather stations within and adjacent to those of the Companies.⁹¹ CRA believes that the consideration of longer-term climate change patterns is appropriate as part of its LTP development.

It is important to note that the Climate Study also states, “Although observed [temperature] trends show greater warming in the winter than in other seasons, there is too much uncertainty in the climate models to conclude that this trend will continue.”⁹² In addition, “climate change is creating conditions that will increase the frequency and severity of many types of extreme events”.⁹³ CRA believes that the consideration of longer-term climate change patterns is appropriate as part of its LTP

⁸⁸ NYSEG and RG&E, *Climate Change and Vulnerability Study*, 23. NY PSC Case 22-E-0222. September 22, 2023.

⁸⁹ *Id.*, 28 and 34.

⁹⁰ Goff, Amarakoon, and Curtis, *New York State Climate Impact Assessment: Chapter 2*, January 9, 2024.

⁹¹ *Id.*, 19-22 (including Figure 2-10).

⁹² *Id.*, 55 – 56.

⁹³ *Id.*, 58 – 59.

development without compromising reliability, safety, and affordability of service to customers.

The Companies should evaluate the “NYS Climate Impact Assessment” document and incorporate the relevant data for its service areas into a study that includes sensitivities of the long-term impacts, as well as the implications on the LTP process and key assumptions. The study should be filed within the LTP docket to inform stakeholders of potential implications and tradeoffs.

The Companies should update their design and normal degree day calculations to incorporate recent data on customer usage and usage per degree day, including the effects of increased energy efficiency, and results should be incorporated into updates to the LTP.

3.2. Gas Supply and Upstream Resources

3.2.1. Background

The Companies maintain portfolios of gas supply, transportation, storage, and peaking assets necessary to reliably serve customers, even on the coldest days of the year. The majority of both NYSEG and RG&E’s portfolios are comprised of contracts for flowing supplies (i.e., supplies delivered via upstream transportation) and storage. RG&E relies on winter-delivered citygate peaking contracts, whereas NYSEG relies on CNG for peaking supplies.

The Companies’ territories are grouped into pooling areas for the purpose of supply planning based on the pipelines that supply the area. NYSEG holds upstream pipeline capacity on Algonquin Gas Transmission (“AGT”), Eastern Gas Transmission and Storage (“EGTS”), Empire Pipeline (“Empire”), Iroquois Gas Transmission (“Iroquois”), North Country Gas Pipeline (“North Country”), Columbia Gas Transmission (“TCO”), Tennessee Gas Pipeline (“TGP”), and TransCanada PipeLines (“TCPL”), and storage on Arlington Storage Company (“ASC”), EGTS, TCO, and TGP. As noted, NYSEG also relies on CNG for peaking supplies. RG&E holds upstream pipeline capacity on

EGTS, Empire, and TCPL, and storage on EGTS and Empire. RG&E also relies on firm contracts for peaking supplies delivered to the citygate.⁹⁴

Conventional natural gas (flowing gas) is sourced from the Marcellus region (Pennsylvania, Ohio, West Virginia) and Eastern Canada. Natural gas from these regions allows the Companies to access this abundant supply with the shortest pipeline transportation distance to their gas systems. NYSEG has three active RNG facilities directly interconnected to its distribution system, with two more under construction and four additional projects in various stages of development.⁹⁵

The Companies utilize a gas purchasing strategy that includes monthly minimum base-load purchases and daily swing contracts. In addition, the Companies employ a gas hedging strategy to manage price volatility, as required by the Commission.

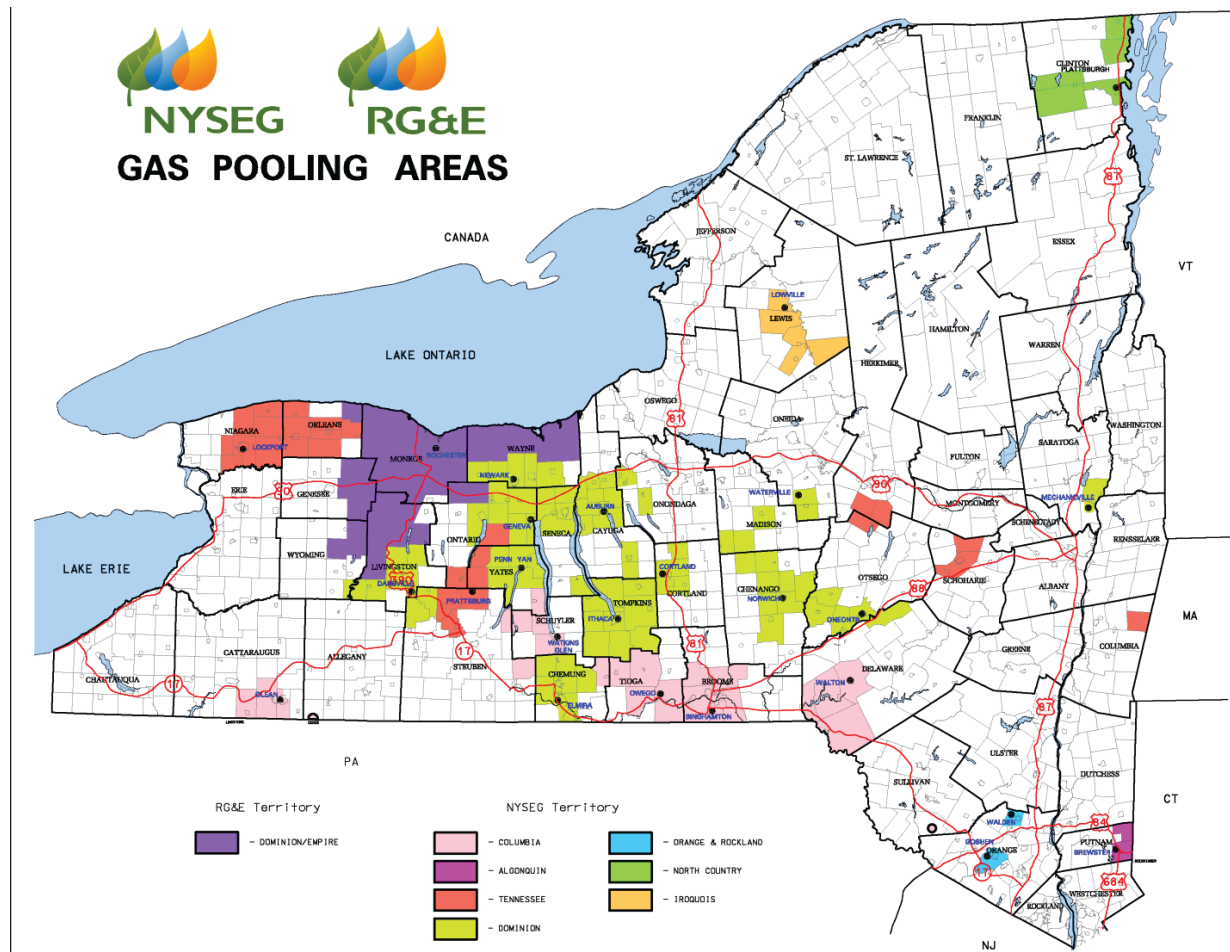
Figure 3-1 shows the Companies' service territories color coded to indicate the gas pooling areas.⁹⁶

⁹⁴ NYSEG and RG&E, *Winter Supply Plan*, Case 23-M-0230, 2023-2024, July 19, 2023, Table 4

⁹⁵ NYSEG and RG&E, *Final LTP*, 98.

⁹⁶ NYSEG and RG&E, *Gas Transportation Operating Procedures Manual*, October 1, 2021, B-2.

Figure 3-1: NYSEG and RG&E Gas Pooling Areas



The Companies have provided details that include each citygate/interconnection to the pipeline delivery network.⁹⁷ They also provided information related to in-system supply resources such as CNG to meet peak hour/daily delivery requirements. Additionally, local production, landfill gas, and RNG supply volumes are purchased on an interruptible basis but are not considered firm and, therefore, are not relied upon to meet design day requirements.⁹⁸

⁹⁷ NYSEG and RG&E, Responses to CRA LTGP-23-001 and LTGP-23-002.

⁹⁸ NYSEG and RG&E, Response to CRA LTGP-23-003.

To demonstrate their winter preparedness, the Companies and all New York State LDCs submit their Winter Supply Plans to DPS Staff prior to each winter season containing a five-year forecast showing supply and demand balances including a comparison to prior winter actual vs forecast peak. This information is updated prior to and during the winter as new information becomes available. The Companies' Supply Plans are provided as responses to specific questions by DPS Staff that contain details on plans to meet their peak day, seasonal, and annual firm and non-firm gas customer requirements under both design and normal weather HDD conditions forecasted. These plans, in addition to other information, include:

- Listings of all gas pipeline and storage contracts that have firm deliverability requirements and are delivered to the citygate services from a third party;
- Capacity provided to and delivered by retail marketers and balancing requirements; and
- Communication protocols verification by interruptible customers on their ability to switch off gas as required to maintain reliability of service to firm customers.⁹⁹

The Order Adopting Gas System Planning Process established LTP requirements for forecasts of demand and supply with a 20-year horizon. The supply forecast should include the LDC's planned composition of the supply portfolio, including firm pipeline contracts, gas storage, peaking supplies, demand response, EE, electrification, and contingency supplies (e.g., compressed natural gas).¹⁰⁰

The Companies provided the following figures comparing NYSEG and RG&E's Reference Case design day demand and peak firm capacity portfolio over the 20-year

⁹⁹ NYSEG and RG&E, *Winter Supply Plan* – Case 23-M-0230, September 2023 Update.

¹⁰⁰ NY PSC, *Order Adopting Gas System Planning Process*, May 12, 2022, 11.

period. Both NYSEG and RG&E are expected to have sufficient resources to meet the Reference Case design day demand on a total system basis.¹⁰¹

Figure 3-2: NYSEG Total System Firm Peak Day Capacity and Design Day Demand

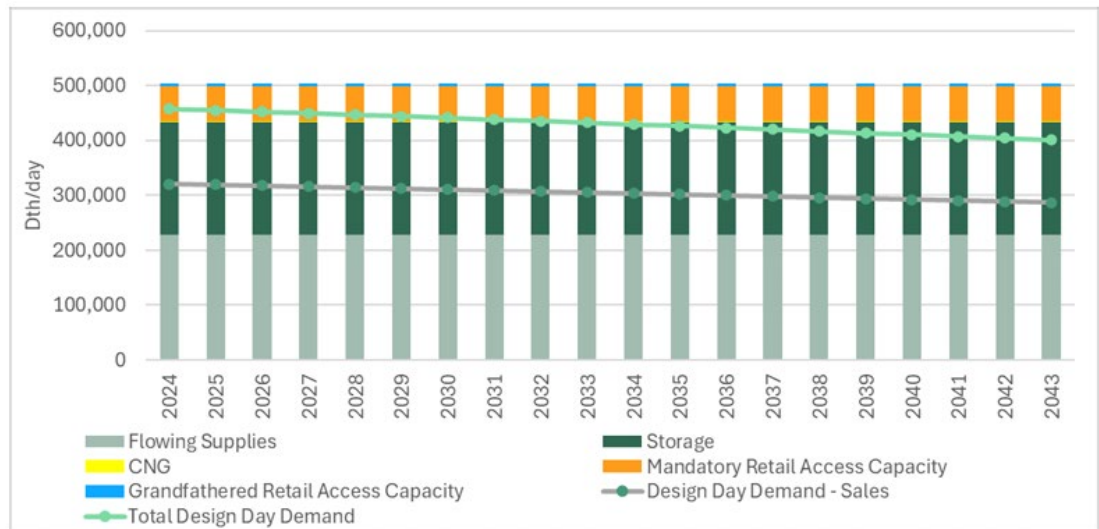
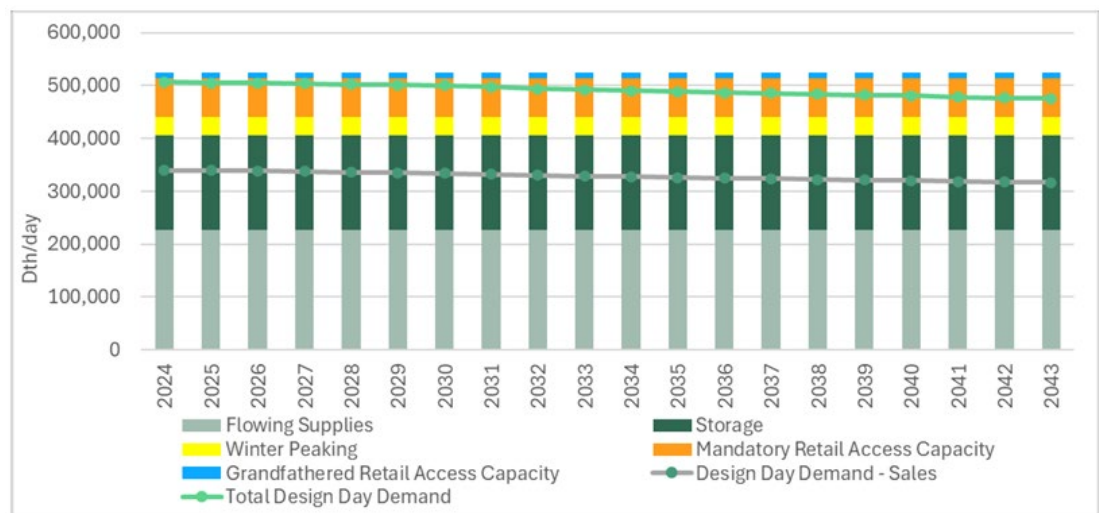


Figure 3-3: RG&E Total System Firm Peak Day Capacity and Design Day Demand



¹⁰¹ NYSEG and RG&E, *Final LTP*, 44.

3.2.2. Stakeholder & Company Feedback

The Companies' reply comments address CRA recommendations to develop a strategy to manage contract restructuring and de-contracting of capacity, investigate opportunities for customer cost reductions by releasing available capacity, and investigate opportunities to relinquish Federal Energy Regulatory Commission ("FERC") regulated pipeline and storage capacity at the end of contract terms. These reply comments state:

NYSEG and RG&E already perform each of these tasks when they undertake gas supply and capacity planning processes to address changes in demand during their normal course of business because contracting for firm pipeline transportation and storage capacity is key to providing reliable service. The Companies continuously evaluate the portfolio's ability to meet forecasted demand and consider factors that include the cost, quantity, reliability, diversity, flexibility, duration, contract begin and end dates, likelihood of re-contracting in the future, and operational issues associated with each resource individually as well as for the portfolio as a whole. This evaluation is especially important when contracts are approaching the end of term. Staff is made aware of how this evaluation affects contracting decisions through periodic meetings to discuss the Companies' portfolio.

Based on current demand forecasts, there are no immediate plans to turn back capacity because de-contracting should not be executed until meaningful and sustainable reductions in demand are realized and are expected to persist for the long term. Premature de-contracting creates risks that the portfolio may be unable to meet customer demand, which will cause serious safety and reliability issues. However, the Companies will continue to execute available capacity release transactions to reduce costs for customers and evaluate all portfolio opportunities. Updates to portfolios will be provided in future LTPs and Winter Supply Plans.¹⁰²

In their reply comments, the Companies also state that "Gas planning practices do not include a material reserve margin or 'extra available, just in case' for such days."¹⁰³

They discuss the design day forecast process, stating, "This should be done annually to allow for differences in efficiencies, new end uses, and consumer behavior to be

¹⁰² NYSEG and RG&E, *Reply Comments on the Initial LTP*, 16 – 17.

¹⁰³ *Id.*, 14.

incorporated into the analysis. The Companies review and update their design day demand forecast annually for exactly these reasons, and will continue to do so, as the design day forecast is a critical component for capacity, supply, and distribution system planning.”¹⁰⁴

In their comments on the Revised LTP, NYSERDA notes that the Companies do not model decreases in pipeline and storage capacity costs (other than to a limited extent in the CRA scenarios). This is in spite of large decreases in design day demand in 2043. “NYSERDA recommends that the Companies update their modeling assumptions to reflect pipeline and storage capacity cost reductions proportional to the forecast design day demand reduction in each scenario.”^{105,106}

3.2.3. Findings

The Companies provided their Supply Plans that demonstrate they had sufficient supply and pipeline and storage capacity resources to meet the needs of all their firm customers during the recent winter heating seasons. They also reported that no firm customers were curtailed, and interruptible customers responded when the Companies needed this customer class to cease utilizing gas.¹⁰⁷

Interruptible customers reduce usage when requested by the Companies, allowing for a reduction in peak demand. This helps to avoid the need for additional gas infrastructure and is, in fact, a form of demand response.

The Companies’ programs support customer choice by providing firm pipeline capacity, storage, and balancing services to retail marketers serving firm customers.

¹⁰⁴ *Id.*, 13.

¹⁰⁵ NYSERDA, *Comments on the Revised LTP*, 5-7.

¹⁰⁶ Note that the Companies have adjusted their model in the Final LTP to reduce pipeline and fixed storage costs in the LTP only (not the Companies’ alternative scenarios). The methodology used can be found beginning on page 28 of the Final LTP.

¹⁰⁷ NYSEG and RG&E, *2023-2024 Winter Plan*, July 19, 2023, 12.

The Companies' 2023/2024 Winter Supply Plans included supply and demand balances for NYSEG and RG&E systems for forecasted winter peak day demand of their firm customers. Regarding the ability to serve firm load, the Companies stated:

*The Companies do not anticipate any issues that would prevent them from serving firm load in the upcoming heating season apart from a force majeure event.*¹⁰⁸

A detailed summary of all NYSEG and RG&E's firm pipeline capacity, firm storage, Peaking/Delivered Services and CNG contracts can be found in response to [LTGP-23-024 and LTGP-23-025]. Included for each contract was the maximum daily quantity (MDQ), expiration date, and any contractual right to extend such as evergreen and/or Right of First Refusal (ROFR).¹⁰⁹

Most of the Companies' pipeline capacity and firm storage contracts used to meet winter peak day, winter seasonal and annual demand are operating under contract terms that provide for termination by the end of 2026 but provide for the right to extend either by evergreen contract arrangements and/or right of first refusal. This provides the Companies with flexibility to address changes in underlying customer demand over the 20-year planning horizon and under LTP scenarios being evaluated. The Companies' assessment is as follows:

*The Companies indicated that they are not aware of any upstream pipeline projects that will impact or improve peak day deliverability into the NYSEG or RG&E gas systems upon completion.*¹¹⁰

Both NYSEG and RG&E utilize Delivered Peaking Services to supplement their Winter Supply Portfolios.

As seen in the response to LTGP-23-026:

Due to the value of upstream (pipeline) transmission capacity in Mid-Atlantic and Northeast, the Companies do not plan to turn back pipeline capacity if there

¹⁰⁸ *Ibid.*

¹⁰⁹ NYSEG and RG&E, Responses to LTGP-23-024 and LTGP-23-025 and Attachment 1 to both responses.

¹¹⁰ NYSEG and RG&E, Responses to LTGP-23-022 and LTGP-23-023.

is a forecasted decrease in future demand, as once capacity is turned back it is unlikely it would be available again in the future.

In response to LTGP-23-071 the Companies indicated that they incorporate an operating reserve margin as part of their Design Day planning that is incorporated in their supply portfolio planning to address contingencies that could occur. The Companies utilize the following methodology in determining this level of operating reserve, asset type and how it is utilized by the eight supply pooling points as follows:

As for reserve margins, each load area's reserve margin is determined by dividing firm requirements (firm, non-daily metered load; balancing obligations; firm capacity obligated to be held to serve daily metered, critical care customers without an alternate fuel; and, customers taking service under NYSEG stand-by sales service) into contracted firm deliverability. Firm transportation capacity, firm storage transportation, citygate delivered supply, and peaking services are all considered as part of total firm deliverability.¹¹¹

The Companies provided the following information as part of a meeting on Reserve Margin and Operational Available Capacity:

The Companies use 5% and 2% as guidelines as a reserve margin for all operating areas. Falling below 2% would trigger a review and recommendation to rectify the situation. Each supply pooling area has unique characteristics that may require the Companies to deviate from this to maintain reliability.¹¹²

The costs associated with the operating reserve margin is included in the costs of the gas portfolio for firm customers.

Generally, LDCs do not incorporate a reserve margin in planning for their gas system and rely upon meeting their peak day demands under design conditions that are based on a coldest weather standard. Unlike electric system design practices, LDC reliability planning standards do not generally include a capability to continue serving load after loss of the most significant supply and rely almost exclusively on the delivery of supply

¹¹¹ NYSEG and RG&E, Response to LTGP-23-071.

¹¹² NYSEG and RG&E Reserve Margin/Operational Available Capacity Presentation, February 2, 2024.

by interstate pipelines to the numerous interconnection points across their gas systems and in-system peaking resources (i.e., LNG, CNG, or synthetic natural gas). In contrast to the electric system planning which maintains a reserve margin to allow for generation or transmission outages on the electric system during the peak hour, all of gas supply resources are assumed to be available to meet peak design day customer demand requirements. Events impacting the natural gas pipeline network could result in reduced delivery capabilities of an interstate pipeline, compressor station, or a gate station that could result in loss of supply and reduction in pressure necessary to serve customers resulting in potential customer outages.

As shown in Figure 3-4, for the NYSEG Reference Case, the difference between the level of Firm Peak Day Capacity and Design Day Demand is forecasted to increase from 9.45% in 2024 to 20.51% in 2043.

The difference between Firm Peak Day Capacity and Design Day Demand for the NYSEG LTP Scenario is forecasted to decrease from 9.45% in 2024 to 6.38% in 2043 (see Figure 3-5). This decrease is a result of the change made by the Companies in their Final LTP (compared to their Revised LTP).¹¹³ In the Final LTP, the Companies' reduce fixed pipeline and storage costs as design day demand decreases for their LTP only, as discussed later in this section.

¹¹³ The corresponding values from the Companies' Revised LTP can be found in Figure 3-4 and 3-5 of CRA's Preliminary Findings Report. Figure 3-5 in CRA's Preliminary Findings Report showed a variance of 33.80%, showing that the Companies' change in their Final LTP following CRA's recommendation leads to a significantly reduced reserve margin.

Figure 3-4: NYSEG Reference Case Variance Between Firm Peak Day Capacity and Design Day Demand¹¹⁴

Year	Firm Peak Day Capacity (Dth/Day)	Design Day Demand (Dth/Day)	Difference between Capacity and Demand (Dth/Day)	Variance (%)
2024	504,635	456,944	47,691	9.45%
2043	504,635	401,119	103,516	20.51%

Figure 3-5: NYSEG LTP Variance Between Firm Peak Day Capacity and Design Day Demand¹¹⁵

Year	Firm Peak Day Capacity (Dth/Day)	Design Day Demand (Dth/Day)	Difference between Capacity and Demand (Dth/Day)	Variance (%)
2024	504,635	456,944	47,691	9.45%
2043	366,093	342,738	23,355	6.38%

As shown in Figure 3-6, for the RG&E Reference Case, the difference between the level of Firm Peak Day Capacity and Design Day Demand is forecasted to increase from 3.51% in 2024 to 9.33% in 2043.

The difference between Firm Peak Day Capacity and Design Day Demand for the RG&E LTP Scenario is forecasted to increase from 3.51% in 2024 to 4.82% in 2043 (see Figure 3-7). This decrease is a result of the change made by the Companies in their Final LTP (compared to their Revised LTP).¹¹⁶ In the Final LTP, the Companies'

¹¹⁴ NYSEG and RG&E, *Final LTP Appendices*, Tables E-4 and E-5.

¹¹⁵ *Id.*, Tables D-24 and D-69. Design day demand values were converted from Mcf/day to Dth/day using the 1.03 Gas Heating Value conversion factor provided in Table A-1 of Appendix A of the Revised LTP.

¹¹⁶ The corresponding values from the Companies' Revised LTP can be found in Figure 3-6 and 3-7 of CRA's Preliminary Findings Report. Figure 3-7 in CRA's Preliminary Findings Report showed a variance of 23.12%, showing that the Companies' change in their Final LTP following CRA's recommendation leads to a significantly reduced reserve margin.

reduce fixed pipeline and storage costs as design day demand decreases for their LTP only, as discussed later in this section.

Figure 3-6. RG&E Reference Case Variance Between Firm Peak Day Capacity and Design Day Demand¹¹⁷

Year	Firm Peak Day Capacity (Dth/Day)	Design Day Demand (Dth/Day)	Difference between Capacity and Demand (Dth/Day)	Variance (%)
2024	524,822	506,391	18,431	3.51%
2043	524,822	475,830	48,992	9.33%

Figure 3-7. RG&E LTP Variance Between Firm Peak Day Capacity and Design Day Demand¹¹⁸

Year	Firm Peak Day Capacity (Dth/Day)	Design Day Demand (Dth/Day)	Difference between Capacity and Demand (Dth/Day)	Variance (%)
2024	524,822	506,391	18,431	3.51%
2043	432,909	412,023	20,886	4.82%

In its Final LTP, the Companies indicated that if decarbonization policies or other market changes cause sustained reductions to firm peak demand, they will need to restructure their respective supply portfolios to better align with observed customer demand, but the ability to maintain a safe and reliable source of energy to serve customers today and in the future must remain top priority.

¹¹⁷ NYSEG and RG&E, *Final LTP Appendices*, Tables E-3 and E-5.

¹¹⁸ NYSEG and RG&E, *Final LTP Appendices*, Tables E-3 and E-4.

In describing their approach, they will also have to consider the timing in which relevant existing contracts are set to expire or enter re-negotiation.¹¹⁹

Differences between NYSEG's non-contiguous service areas and RGE's service area as one contiguous territory create unique challenges and opportunities associated with contract restructuring. Contract restructuring for both utilities will depend not only on the location where demand is reduced, but also on the timing of contracts' renewal dates within that location.

To the extent possible, the Companies will adopt the following strategy in restructuring firm contracts¹²⁰:

1. Quantify observed reductions in customer demand within one of NYSEG and RG&E's pooling areas or citygates.
2. Confirm such reductions in demand have occurred for a prolonged period such that demand is not expected to increase, to ensure that capacity is not turned back prematurely.
3. Once prolonged, material reductions occur within an area, review the contracts serving that area to identify options to restructure contracted capacity.
 - This step will depend on contract renewal dates and negotiations with pipelines.
 - If multiple contracts supplying an area are approaching their end of term, the Companies will evaluate each contract based on factors such as flexibility, target reduction volume, access to storage, and price.

In addition, the Companies will continue to execute available capacity release transactions to reduce costs for customers and evaluate all portfolio opportunities.

¹¹⁹ NYSEG and RG&E, *Final LTP*, 28-29.

¹²⁰ *Ibid.*

3.2.4. Recommendations

CRA recommends the Companies perform a study to justify having a reserve margin at the levels shown in Figure 3-4 and Figure 3-6 while also utilizing a coldest design day standard. The Companies should include research on gas utility planning best practices that show reserve margins at these levels. The study should include discussion of the methodology utilized to determine the appropriate level of operating reserve, asset type and associated cost, frequency of re-evaluation and how its utilized by the eight supply pooling points. This should be used to justify criteria used to establish required reserve capacity to supplement potential ESCO marketer or local production non-performance. Study results should be filed within 120 days after the Commission Order on the NYSEG/RG&E LTP.

The Companies have provided their initial strategy on how they would approach decreasing their firm capacity portfolio contracts as reductions in demand have been observed within distinct locations for prolonged periods. This is an important first step in the LTP process. CRA recommends that the Companies develop a more robust and comprehensive approach to reconfiguring their firm capacity portfolio that includes establishing a ranking criteria to manage contract restructuring and de-contracting of capacity, considering the demand reductions and locational factors reflected in the LTP. This could result in reduced costs for customers without compromising reliability throughout the transition period. An example of a potential approach where elements can be incorporated is provided for reference in the Con Edison/O&R Final LTP100F.¹²¹ Additionally, CRA recommends that the Companies should continue to further investigate and update their strategy accordingly.

This would provide the Companies with the opportunity to reduce FERC regulated pipeline and storage capacity or reduce contractual maximum delivery quantities at the end of their contract terms without continuing to incur ongoing costs. This will

¹²¹ Consolidated Edison Company of New York, Inc. and Orange & Rockland Utilities, Inc., *Gas System Long-Term Plan*, 67. NY PSC Case 23-G-0147. Nov 29, 2023, 50.

enable the Companies to identify and resolve any barriers to reducing contractual commitments necessary to implement the LTP's objectives.

The Companies should review their current portfolio and evaluate alternative approaches to determine the recommended portfolio of pipeline, storage, peaking, and gas supply options to meet the needs of the proposed LTP. Consideration should be given to the requirements of the proposed hybrid heating model as well as the full electrification scenarios in order to understand the implications of both on fixed capacity and variable commodity costs. Ultimately, the Companies should aim to ensure their plan results in the best cost solution for customers while maintaining reliability, flexibility, and resiliency.

A report should be developed that includes metrics that can be shared with stakeholders as part of the LTP process that summarizes the fixed pipeline and storage cost reduction benefits achieved by the Companies' capacity release transactions (including Asset Management Agreements) and the resulting reductions in costs for customers. This information can provide stakeholders with more insight into the tradeoffs considered in the Companies' evaluation of their portfolio options. These cost reductions should also be incorporated into future LTP updates.

The Companies should provide their weighted performance criteria for their delivered service contracts in the LTP.

CRA acknowledges the Companies' response to CRA's recommendation and stakeholder feedback, as they are now modeling a reduction in fixed pipeline and storage costs in the LTP to reflect the potential for contract restructuring as design day demand decreases, consistent with concepts included in the CRA/Stakeholder scenarios.

However, the fixed pipeline and storage costs in the Reference Case and all Company scenarios are assumed to remain constant over the forecasted period. CRA recommends adjusting this assumption for the Reference Case and all Companies' scenarios, consistent with the declining design day demand over time shown in the

LTP.¹²² The LTP shows a 25% and 19% decrease in design day demand throughout the forecast period for NYSEG and RG&E, respectively.¹²³ Maintaining a constant level of pipeline and storage capacity in these scenarios despite declining design day demand and potentially increased rates charged by pipelines and storage providers (and approved by FERC or negotiated by the Companies) could pose an undue hardship on customers.

CRA also recommends utilizing the average annual percentage change experienced during the prior ten-year period for each of the Companies to adjust the forecasted annual fixed costs. Maintaining a constant level of pipeline and storage capacity despite declining design day demand and potentially increased rates could pose an undue hardship on customers.

3.3. Non-Pipe Alternatives

3.3.1. Background

NPAs are investments that “utilize third party solutions to defer or avoid certain traditional natural gas capital projects (i.e., pipes) that are needed to address natural gas system reliability needs.”¹²⁴ NPAs can be completed to avoid construction of new line segments and/or replacement or expansion of existing infrastructure. Additionally, utilities are directed to consider disadvantaged communities when evaluating NPAs.¹²⁵

The Gas Planning Order established a dual-track approach for evaluating NPAs. Projects that exceed cost and implementation timeline thresholds will require the Companies to pursue a “full-scale solicitation of NPA followed by a [BCA] of potential solutions.”¹²⁶

¹²² See Table D-24 for NYSEG and Table D-69 for RG&E in Appendix D of the Final LTP.

¹²³ NYSEG and RG&E, *Final LTP Appendix D*, D-24 and D-69.

¹²⁴ NYSEG, *Non-Pipe Alternatives*, 2023. Available from <https://www.nyseg.com/ourcompany/reliableservice/reliability-projects/non-pipe-alternatives>; accessed November 20, 2023.

¹²⁵ NY PSC, *Gas Planning Order*, 40.

¹²⁶ *Id.*, 37.

The Commission's Gas Planning Order required utilities to propose NPA suitability criteria within 90 days of the effective date of the Order.¹²⁷ The Companies filed their NPA Screening and Suitability Criteria on August 10, 2022. Their criteria can be summarized by the following table, found within page 5 of their filing:

Figure 3-8: Proposed NPA Screening and Suitability Criteria

Criteria	Description	
Project Type	Conditions do not pose an immediate threat to public safety and/or project is not customer-funded	
Project Timeline	Minimum of 12 months to start of construction	
Project Cost	Large project: > \$2 million	RFP process is used to evaluate NPA feasibility
	Small project: ≤ \$2 million	Streamlined analysis may be used to evaluate NPA feasibility

3.3.2. Stakeholder & Company Feedback

In its Comments on the Initial LTP, AGREE states that the Companies need to be more proactive in replacing LPPs with NPAs, noting that “the majority of the Companies’ significant investments are in leak-prone pipe replacement,” which will likely lead to higher customer costs and stranded costs.¹²⁸ AGREE notes that focusing on opportunities for NPAs would be consistent with the NFG LTP Order which “direct[s] NFG to ‘evaluate segments of LPP scheduled for replacement at least 18 months into the future’ and endorse[s] a ‘neighborhood approach’ for LPP evaluation.”¹²⁹

Ratepayer and Community Intervenors believe the Companies assessment of NPA falls short of the goal, stating, “A long term plan should present scenarios to reduce

¹²⁷ *Id.*, 41.

¹²⁸ AGREE, *Comments on the Initial LTP*, 6.

¹²⁹ *Ibid.*

pipe usage and decommission sections systematically. This plan totally fails to do so.”¹³⁰

SC/EJ also points out that “NPAs are more consistent with the CLCPA targets than building new infrastructure.”¹³¹ With better planning, NYSEG and RG&E could maximize benefits for their customers “by pursuing a phased transition of their system. . . by avoiding reinvestment in gas networks by repairing or decommissioning leak-prone pipes rather than replacing them.”¹³² While the Companies present three NPA projects planned in disadvantaged communities, the LTP falls short of providing a discussion of how the Companies will directly ensure 35% of the benefits of all NPA investments are allocated toward disadvantaged communities.¹³³ In general, SC/EJ believes the Companies need to scale up the use of NPAs to meaningfully reduce emissions.¹³⁴

Strategen speaks to NYSEG and RG&E’s plan for continued investment into its distribution system saying, “[b]y failing to develop tailored capital forecasts that account for electrification, the Companies do not reasonably assess the ability of NPAs to avoid replacements and contribute to scenario goals.”¹³⁵ But beyond this, the Companies’ fail to provide a “no-infrastructure” scenario as required per the Gas Planning Order. Instead, the Companies plan to rely on hydrogen and RNG which requires continued maintenance and build-out of the distribution system.¹³⁶

The Companies respond to two main concerns from SC/EJ and Strategen:

- (1) Capital costs should be materially reduced in the two Full Electrification scenarios as customers electrify; and

¹³⁰ Ratepayer and Community Intervenors, *Comments on the Initial LTP*, 2.

¹³¹ SC/EJ, *Comments on the Initial LTP*, 8.

¹³² *Id.*, 17.

¹³³ *Id.*, 49.

¹³⁴ *Id.*, 49-50.

¹³⁵ Strategen, *Comments on the Initial LTP*, 19.

¹³⁶ *Id.*, 11.

(2) Capital costs should account for repairing instead of replacing LPP.

The Companies disagree with the expectation that capital expenses will decline proportionally with decreases in demand and customers. They state that to retire any portion of the gas system 100% of the load on the particular segment of pipe must be electrified and that segment must not be used to deliver gas downstream. The Companies believe that since electrification will likely be scattered rather than concentrated throughout the system, it will be difficult to meet those conditions.

The Companies also disagree that LPP can be easily repaired rather than replaced. They assert that LPP degrades over time and are better addressed with replacement than repairs. They add that replacement is key to ensure safety and reliability.

The Companies address CRA and SC/EJ's claims that they have not adequately considered NPAs across their systems. They state that they screen all main capital projects for applicability, not just those in vulnerable locations. They note that many NPA projects would still not avoid the replacement of LPP. The only projects that would avoid this would be those involving full electrification at the edges of the gas system so that the pipe does not supply downstream customers. The Companies cite the Commission's recent order on Con Edison's rate case stating that "We cannot impose an enforceable commitment on Con Edison to use NPAs to address [LPP] or service line replacements because the appropriateness of NPAs must be determined through a detailed process..." They reiterate that LPPR is necessary to maintain safety and reliability, and they are committed to considering NPA solutions.

3.3.3. Findings

The Companies evaluate all gas capital infrastructure by conducting a screening process to determine if the project is a suitable candidate for an NPA solution. Gas distribution projects associated with load growth, main or service replacements, and

replacement of LPMs are included. Projects involving a new pipeline, a pipe replacement, or expansion of an existing pipeline are evaluated.¹³⁷

An update was provided in the Final LTP regarding NPAs:

- *In the past two years, NYSEG/RG&E Gas System Planning evaluated 454 gas pipeline projects (442 LPM projects and 12 capital projects).*
 - *63 of the LPM projects passed initial screening and were sent to the Companies' NPA team for feasibility screening and 1 passed.*
 - *Three RG&E customers have been electrified and 119-feet of LMP was decommissioned in Irondequoit, NY.*
- *All 12 of the capital projects were sent to the Companies' NPA team for feasibility screening and 3 passed.*
 - *NYSEG's Lansing NPA is being implemented.*
 - *The RFP for NYSEG's Canandaigua project yielded no viable solutions from the market.*
 - *RG&E's MF60 Southeast System NPA proposal is under review.*¹³⁸

The Companies further discuss this on page 112 of the LTP:

The Companies have agreed to consider factors other than cost-effectiveness when evaluating potential NPAs located within a DAC, including income levels in the target area. In addition, respondents to NPA RFPs will be required to provide information on how their proposals will benefit customers within DACs.

Additionally, the Technical Conference presentation includes the following:

Consistent with regulatory requirements, the Companies will continue to review all natural gas capital infrastructure projects, including LPM projects, for NPA suitability. As part of the LTP, the Companies will report on NPA progress.

While cost-effectiveness determined through a BCA approach is an important driver for NPA consideration, the Companies will take additional factors into account including risk ranking of project, proximity to vulnerable system

¹³⁷ NYSEG and RG&E, Responses to CRA LTGP-23-014 and LTGP-23-015.

¹³⁸ NYSEG and RG&E, *Final LTP*, 114.

*locations, income level of impacted area and other important designations (e.g., disadvantaged communities)*¹³⁹

The Companies do have experience with NPAs.

Over the past several years, NYSEG's Ithaca division has experienced significant demand on its natural gas distribution system, which has led to low system pressure during peak conditions (i.e., the coldest days in the winter) in the Lansing, Tompkins County area. A steady decline in system pressure has led to reliability concerns impacting the region. A moratorium was implemented in Lansing in 2015, with prohibition on new gas service attachments that currently is still in place.¹⁴⁰

Throughout the last decade, NYSEG has sought to resolve these reliability concerns through both traditional and non-traditional means. After multiple rounds of RFPs by NYSEG, the Commission issued the Lansing NPA Order, which authorized NYSEG to proceed with the Lansing NPA Portfolio.^{141, 142}

The history and status of the portfolio is provided on page 31 of the Final LTP. It is also summarized below from the Companies' LTP:

¹³⁹ NYSEG/RG&E Gas Long Term Plan Technical Conference Non-Pipes Alternative (NPA) Presentation 01/18/2024, 13. Accessed from <https://www.nyseg.com/documents/40132/84304120/2024-01-18+Tech+Session+Final.pdf/46f27c40-6eb4-0864-8eb4-e167e5b9c2d6?t=1705701684461>.

¹⁴⁰ NYSEG and RG&E, *Final LTP*, 31.

¹⁴¹ NYSEG and RG&E, *Non-Pipes Alternative 2023, Third Quarter Report* November 2023. 8.

¹⁴² Case 17-G-0432 Petition of New York State Electric & Gas Corporation for Authorization to Construct a Natural Gas Compressor Pilot Project in Tompkins County, NY, Order Approving Petition for Non-Pipe Alternative Projects, with Modifications, issued June 21, 2021 ("Lansing NPA Order").

Figure 3-9: Lansing NPA Project Portfolio Overview¹⁴³

NPA	Description	Hourly Gas Demand Savings (MCFH)	BCA	Project Activity/Status	Proposed In-Service Date
Active Projects					
Residential Heat Pumps	Installation of residential heat pumps with supportive energy efficiency solutions	42.7	0.72	Contract executed in June 2022	Q3 2022-Q3 2025
Non-Residential Heat Pumps	Implementation at a single non-residential building of a ground source heat pump and energy efficiency solutions	0.41	0.09	Contract executed in August 2022	Q4 2024
Ground Source Heat Pump Community Loop	Installation of a community loop ground source heat pump project along with gas energy efficiency for a specific neighborhood in the highest impact zone	2.05	0.25	Contract negotiations underway	TBD
Gas Energy Efficiency	Implementation of gas energy efficiency solutions at two buildings and installation of new energy efficient boilers at one of the buildings.	4.08	0.07	Contract executed in October 2022	Q4 2024
Education and Outreach	Education and outreach program in the Lansing School District area coupled with additional heat pump incentives for interested households to switch from gas to electric.	0	0	Contract executed in June 2022	Q4 2022
Cancelled or Withdrawn Projects					
Industrial Waste Heat Recovery	Implementation of a waste heat recovery solution for an industrial gas customers located in the zone of highest impact	n/a	n/a	Cancelled	n/a
Non-Residential fuel switching	Implementation of a demand response salutation of serval non-residential customers switching fuel from natural gas to electric.	n/a	n/a	Cancelled	n/a

Additionally, NYSEG continues to work with the developer of the Lansing Community Ground Source Heat Pump project to execute this remaining contract and expects to file the Implementation Plan for the Lansing NPA Portfolio project upon execution of the remaining contract and will continue to file quarterly NPA status reports with the Commission. The anticipated in-service date for the Lansing NPA Portfolio will be phased over multiple years. NYSEG expects all projects that move forward to be in-service prior to the 2025/2026 heating season.¹⁴⁴

¹⁴³ *Id.*, 32.

¹⁴⁴ NYSEG and RG&E, *Non-Pipe Alternatives Fourth Quarter Report 2023*, 4-5. February 2024.

Additionally, NYSEG's system is reaching capacity in Canandaigua, New York, leading to increased reliability concerns. For this reason, Canandaigua was identified as a potential area for the implementation of NPA solutions. In July of 2022, NYSEG issued an NPA request for proposal ("RFP") in an effort to avoid the need for the construction of the otherwise planned Canandaigua Feeder Reinforcement Project. The NPA RFP was seeking potential cost-effective solution(s) that would meet the identified need, either individually or collectively, to avoid construction of approximately 8,700 linear feet of gas main to reinforce the 124 PSIG feeder main project at an estimated cost of \$2.9 million. In the Canandaigua area, a reduction in demand (or addition in supply) of 55 MCFH is required to improve system endpoint pressure. The term of the agreement associated with this RFP was expected to be 12/01/2023 – 11/30/2033 (10 years).¹⁴⁵

The analysis and review process were placed on hold due to rate case negotiations; however, after the approval of the JP, NYSEG continued discussions with DPS Staff.¹⁴⁶

NYSEG has recently informed the Commission it is no longer pursuing the NPA for the Canandaigua area.¹⁴⁷

The Lansing NPA process was the first of its kind for the Companies. The ongoing Lansing NPA process has been a multi-year effort on the part of the Companies and stakeholders.

Demand growth was a driver for the need to consider NPAs in both Lansing and Canandaigua, as reliability concerns on the distribution systems required consideration of supply-side and demand-side solutions to address these areas.

¹⁴⁵ NYSEG, Request for Proposal, *Non-Pipe Alternative to Canandaigua Feeder Main Reinforcement Project*, July 2022, 4.

¹⁴⁶ NYSEG and RG&E, *Non-Pipes Alternative Third Quarter Report*, November 2023, 3.

¹⁴⁷ NYSEG and RG&E, *Final LTP*, 37.

The Lansing NPA process had significant grassroots community participation in the process from the beginning, which is in contrast to Canandaigua.

NYSEG provided an educational program within the local schools and a community-based outreach program, both to further the goals of the Lansing NPA Portfolio program including increasing awareness and attracting participants to the other projects within the NPA portfolio.

During the NPA Technical Conference Q&A session, the Companies verbally identified the following areas as lessons learned in the NPA Process.¹⁴⁸

- Improvements in the RFP package
- Incorporation of information requirements for developers in contract terms
- Flexibility in agreements
- Enhancements to BCA tools
- Education with the community

Stakeholders provided the following additional observations:

- There are barriers to entry for commercial users.
- Developers of NPA proposals spend a lot of money, effort, and time with nothing to show for it.
- More information on what is coming next on NPAs is needed.

The Commission has clearly indicated the importance of NPAs in the planning process. Within the Gas Planning Order, the Commissions states:

*The Commission agrees with Staff's proposal and requires that LDCs identify, in the annual reports required by this Order, the locations of specific segments of LPP that could be abandoned in favor of NPAs and where infrastructure projects may be needed in the near future to maintain reliability.*¹⁴⁹

¹⁴⁸ NYSEG/RG&E Gas Long Term Plan Technical Conference Non-Pipes Alternative (NPA) 01/18/2024. See notes on the project SharePoint.

¹⁴⁹ NY PSC, *Gas Planning Order*, 39.

The NFG LTP Order states “identifying segments of LPP that the Company can decommission rather than replace by relying on NPAs is critical.”¹⁵⁰

The Revised LTP did not model or include the implementation of any specific NPAs. It does not incorporate any reduction in demand, system capital, or operating costs associated with NPAs being implemented during the 20-year planning horizon.

The Companies’ response to LTGP-23-072 shows that over the two-year period of 2022-2023, 474 projects, both LPM and non-LPM, were evaluated under their NPA screening criteria and 26 were deemed to be feasible for further evaluation.¹⁵¹

The Companies have announced they are planning their next NPA RFP for RG&E’s Southeast Phase 1 & 3 during the first quarter of 2024.¹⁵²

The Companies provided the following description of the RG&E Southeast Phase 1 & 3 proposed NPA project in response to LTGP-23-067 (a):

There are no RG&E capital projects included in the initial Long-Term Plan, however, the MF60 Southeast Phase 1 & 3 is an example of a system reliability project to address system pressure concerns that is identified in RG&E’s 5-Year Capital Plan. At current design day conditions, hydraulic modeling indicates system endpoint pressure of approximately 36 pounds per square inch gage (“psig”) (60% MAOP) and approaches 18 psig (30% MAOP) inclusive of committed residential development projects. The identified system improvement project to install larger diameter gas mains will restore system pressure above 50% MAOP and increase reliability to customers.

The NY PSC advocates for LDCs to take a “neighborhood approach” when evaluating and implementing NPAs.¹⁵³ Areas with LPPs that would typically require traditional infrastructure could instead be addressed with an NPA. The Companies can supplement these efforts of increasing their NPA activity in the future by identifying segments of gas pipe that are serving the few customers that remain after high levels

¹⁵⁰ NFG LTP Order, 44.

¹⁵¹ LTGP-23-072, Attachments 1 and 2

¹⁵² Technical Conference on NPAs, January 18, 2024

¹⁵³ NY PSC, *Gas Planning Order*, 39.

of electrification and by using those opportunities to retire segments of pipe and downsize the system.

The Companies' Whole Home Electrification Program is a program that "targets leak prone main replacement projects" and aims to "achieve full electrification of buildings located in these areas to enable retirement of the impacted sections of the gas main."¹⁵⁴ To make these projects as economical as possible, NPA-based incentives are combined with others that may be available (e.g., New York State Clean Heat Program), resulting in conversion packages offered to customers at no cost.¹⁵⁵

The first project under its Whole Home Electrification Program is within RG&E's service area in Irondequoit, NY. It is targeting the retirement of a segment of LPP by achieving electrification of three homes via an NPA solution.

*Upon implementation, this LPM NPA project will result in the removal of 119 feet of leak prone main and is expected to achieve a reduction in design day demand of approximately 0.173 thousand MCFI. The third-party expert received executed customer agreements from all customers on the LPM segment and the installation contractor performed energy audits in each of the customer homes. Proposals containing a summary of the improvements for each home have been reviewed with the customers and currently, the installation contractor is working with the customers to schedule the conversions. As of December 31, 2023, there have been \$137,850 in project costs incurred. The in-service date for these three conversions was November 2023.*¹⁵⁶

In the LTP, the Companies describe their approaches to address vulnerable locations that includes NPA solutions:

The Companies pursue three approaches to address vulnerable locations: the development of non-traditional pipeline solutions such as an NPA, the development of traditional pipeline solutions such as a pipeline reinforcement project, and monitoring. If the issue causing the vulnerability cannot be

¹⁵⁴ NYSEG and RG&E, *Non-Pipes Alternative Fourth Quarter Report*, February 23, 2024, 5-6.

¹⁵⁵ Avangrid Subsidiaries NYSEG and RG&E "Advance Their First Whole Home Electrification Project in New York", February 22, 2024 Press Release

¹⁵⁶ NYSEG and RG&E, *Non-Pipes Alternative Fourth Quarter Report*, February 23, 2024, 5-6.

*resolved, a moratorium on new customers or increased load from existing customers may be required to maintain safe and reliable service.*¹⁵⁷

The Companies identified their initial list of vulnerable locations in a July 2020 filing.¹⁵⁸ Since the 2020 filing, the Companies have internally monitored and updated the designation of vulnerable areas.¹⁵⁹

Attachment 1 of the Companies' response to LTGP-23-068 provides updates and additional information regarding both supply-side and distribution vulnerable areas under evaluation.¹⁶⁰ Table II-7 of the Revised LTP also summarizes this information.

3.3.4. Recommendations

The Companies should incorporate generic NPA projects and model their impacts on demand and cost reductions in their Final LTP and all scenarios, drawing from their experience with the NPA process, including those located in areas identified as vulnerable areas.

Further information on the Whole Home Electrification Program can be found within the Companies' Q4 2023 NPA Report:

The Companies third-party expert received executed customer agreements from all customers on the LPM segment and the installation contractor performed energy audits in each of the customer homes. Proposals containing a summary of the improvements for each home have been reviewed with the customers and currently, the installation contractor is working with the customers to schedule the conversions.

The Companies have identified several additional areas to target for the LPM NPA Whole Home Electrification Program. Letters, brochures, and a dedicated webpage have been developed and distributed to customers within these targeted areas. The third-party expert is conducting outreach to the target customers to provide additional information regarding the program. The

¹⁵⁷ NYSEG and RG&E, *Final LTP*, 29-30.

¹⁵⁸ NYSEG and RG&E, *Supply And Demand Analysis Related To Service Areas With Known Supply Constraint Vulnerabilities*, Case 20-G-131. 3 – 4. July 17, 2020.

¹⁵⁹ NYSEG and RG&E Proposal for Non-Pipe Alternative Screening & Suitability Criteria, August 10, 2022, 3 – 4.

¹⁶⁰ NYSEG and RG&E, Response to LTGP-23-068, 3 – 4.

*Companies and third-party expert meet on a regular basis to review the projects schedule and status, as well as to collaborate to address challenges and make programmatic changes.*¹⁶¹

While RG&E's first Whole Home Electrification NPA received positive feedback from its participants, the Companies learned that it ultimately resulted in relatively high costs compared to traditional LPM replacement. The Companies also learned that full customer participation is a significant hurdle for electrification NPAs. Identifying portions of the system where projects of this type can be implemented and obtaining consent from all customers can be difficult. These challenges are important for the Companies to consider as they continue to evaluate the potential of electrification NPAs to address LPM.¹⁶²

CRA believes the Whole Home Electrification Program is a positive step for the Companies to support CLCPA goals.

The Companies should report these areas that they are targeting for the Whole Home Electrification Program and discuss how this program can be incorporated and modeled into their long-term gas planning procedures.

CRA recommends the Companies provide information on next steps for RG&E's Southeast 1 & 3 NPA project and planned projects (whether traditional infrastructure or NPAs).

The experiences and lessons learned by the Companies from the Lansing and Canandaigua NPA projects should be developed and reported in the LTP with the objective of enhancing Stakeholders' understanding and future planning.

In their Final LTP, the Companies indicated that they would continue to evaluate the system for vulnerable locations, monitor developments associated with identified areas, and actively pursue resolution when necessary. NYSEG and RG&E will work to proactively conduct community outreach and education as a part of this process

¹⁶¹ Case 22-G-0318, *Non-Pipes Alternatives 2023 Fourth Quarter Report*, February 23, 2024.

¹⁶² NYSEG and RG&E, *Final LTP*, 37.

and will provide updates on vulnerable locations in future LTP filings.¹⁶³ CRA also recommends that a summary of results of the evaluations conducted, and any metrics used to identify the vulnerable locations, also be included in their Annual Update Reports as part of the LTP process in addition to future LTP filings.

3.4. Moratoriums (Distribution Operations)

3.4.1. Background

Localized capacity constraints recently impacted the ability of certain LDCs to accept applications for new gas service in a few regions of New York State, creating a lack of customer access to natural gas service. These events became a catalyst for the need for:

*Improved planning and operational practices that enable them to meet current and future customer needs and expectations in a transparent and equitable way while minimizing infrastructure investments, maintaining safe and reliable service, and if necessary, implementing, maintaining, and revoking moratoria in a fair and consistent manner. Additionally, planning must be conducted in a manner consistent with CLCPA and associated legislation.*¹⁶⁴

Moratorium management procedures (“MMP”) were adopted in response to these circumstances. In developing these procedures, the impact that service moratoriums have on emissions, low- and moderate-income (“LMI”) customers and gas service applicants, and disadvantaged communities were considered. Vulnerable populations should not be disproportionately burdened by a moratorium or the actions taken to lift

¹⁶⁴ NY PSC, Order Adopting Moratorium Management Procedures, Case 20-G-0131, May 12, 2022, 3-4 (“Order Adopting MMP”).

the moratorium. Finally, if the Commission decides that the LDC has not adequately demonstrated the need for a moratorium, it may deny the plan to implement one.¹⁶⁵

3.4.2. Stakeholder & Company Feedback

There was no stakeholder feedback on moratoriums.

3.4.3. Findings

In accordance with the Order Adopting MMP, the Companies incorporated into their tariffs a “Moratorium Needs Criteria” that requires the following process to be followed and information be provided to potentially impacted communities:

- Two-year advance notification of a potential moratorium
- Projected demand that can be met or decremented through alternative solutions without impacting the reliability of service to existing customers
- Detail on the evaluation criteria that will be used, including forecasted design day supply/demand imbalances available for delivery; expected equivalent number of typical new residential or commercial and industrial customers; and the estimated years of expected growth that the system can serve. The metrics provided will demonstrate the need for the moratorium and allow interested entities to work with the LDC on NPAs; and,
- Declaration of a moratorium as a last resort.^{166, 167, 168}

Additionally, the Companies must report all opportunities evaluated to reduce system demand through demand-side management to the Commission. This may include NPAs, EE, electrification, weatherization, and demand response.

¹⁶⁵ *Id.*, 13.

¹⁶⁶ PSC No. 9. Gas – NYSEG Tariff. Section 10-K.

¹⁶⁷ PSC No. 16. Gas – RG&E Tariff. General Information – Sections 2-F and 10.

¹⁶⁸ NY PSC, *Order Adopting Moratorium Management Procedures*, Case 20-G-0131, May 12, 2022, 6.

The town of Lansing was placed in a gas moratorium in 2015; NYSEG has since been unable to approve applications for expanded gas service from new or existing customers in that area.¹⁶⁹ NYSEG submits its NPA Quarterly Progress Report providing the status of these issues for the Lansing Moratorium. This NPA report includes project costs and expenditures, project activities, anticipated in-service dates, project cost and incentive cost recoveries, and operational savings and other benefits.¹⁷⁰

3.4.4. Recommendations

Based on CRA's findings and review of the Companies' LTP, the Companies appear to have reasonably addressed the moratorium process thus far. CRA recommends that the Companies continue to evaluate potential vulnerable areas on their systems and proactively conduct community outreach and education with Stakeholders and entities interested in working on potential NPA solutions.

The MMP proposes the identification and development of reliability metrics and criteria that would necessitate the calling of a moratorium, including "trigger values" that would begin the process. CRA recommends the Companies provide specific quantifiable thresholds for its criteria for vulnerable areas and reliability metrics utilized. This will allow stakeholders to better understand exactly how a location qualifies as vulnerable.

3.5. Strategic Downsizing of the Natural Gas System

3.5.1. Background

Decommissioning of a natural gas main or service refers to the retirement of the infrastructure.^{171, 172} Strategic downsizing is a process in which the retirement of natural gas pipe is done in a proactive, managed, and phased manner in order to

¹⁶⁹ NYSEG and RG&E, *Final LTP*, 31.

¹⁷⁰ In accordance with the November 19, 2020, Electric and Gas Rate Plan Order and a subsequent Lansing NPA Order.

¹⁷¹ California Public Utilities Commission Staff, *Staff Proposal on Gas Distribution Infrastructure Decommissioning Framework in Support of Climate Goals*, 3. Dec 21, 2022.

¹⁷² The terms "strategic downsizing" and "strategic decommissioning" will be used interchangeably in this report.

reduce system operating and maintenance costs for underutilized assets. The CAC's Final Scoping Plan acknowledges that a substantial reduction in natural gas use and a strategic downsizing of the gas system are requirements if New York is to meet CLCPA goals.¹⁷³

To cost-effectively downsize a natural gas system, there are three key objectives according to the Building Decarbonization Coalition:

- 1) *Halt new investment in growth of gas networks*
- 2) *Avoid reinvestment in gas networks by repairing or decommissioning leak prone pipe rather than replacing it*
- 3) *Plan for zonal transitions based on local needs and opportunities*¹⁷⁴

The CAC acknowledges that “[d]uring the transition to the decarbonized systems, some investments in traditional infrastructure will still be necessary to maintain reliability and safety for remaining fossil natural gas customers, but greater scrutiny of such investments is warranted to minimize the level of stranded assets that will make it more expensive to fully decarbonize the fossil natural gas sector.”¹⁷⁵

This transition would require substantial coordination between gas and electric utilities, policymakers, and other stakeholders. Further buildout of the electric transmission and distribution system would be required to meet anticipated increases in electric demand and customer changeover to electric technologies. There are outstanding questions related to electrifying all customers in the near-term, so the CAC calls for further studies on whether full electrification of heating load in the near-term is the most cost-effective and technically feasible option for all customers.¹⁷⁶

It is vital that any downsizing is done in a strategic manner, as a disorganized approach would potentially pose undue burden on all customers, especially low-income customers who have fewer resources and opportunities to electrify. The CAC

¹⁷³ CAC, *Climate Action Council Final Scoping Plan*, 20.

¹⁷⁴ Building Decarbonization Coalition, *The Future of Gas in New York State*, 52. March 2023.

¹⁷⁵ CAC, *Climate Action Council Final Scoping Plan*, 351.

¹⁷⁶ *Id.*, 350.

recommends developing a “comprehensive equity strategy” to ensure LMI households and disadvantaged communities are not left behind.¹⁷⁷ This is critical because LMI customers and those in disadvantaged communities are less likely to be able to afford the up-front costs of electrifying. As more customers leave the gas system, those unable to afford these costs would be left to pay increased utility bills as there are now fewer customers for the utilities to recover their fixed costs from. This process would especially impact low-income and vulnerable populations.¹⁷⁸ Stakeholder comments on the stranded cost issue as it relates to affordability and disadvantaged communities can be found in Sections 3.15.2 and 3.16.2.

Various key regulatory obstacles to a strategic downsizing effort could potentially be addressed by Governor Hochul’s *Affordable Gas Transition Act*, proposed in January 2024, and discussed in Section 1.3.1 of this report. It would remove the longstanding utility obligation to serve for gas utilities, give the NY PSC authority to retire portions of the gas distribution system in certain instances, and remove the “100-foot rule” for new natural gas customers that reduces cost to the customer for a new gas service.¹⁷⁹

The Transportation, Economic Development and Environmental Conservation Article VII Bill, which is part of the FS 2025 NYS Executive Budget, includes the following:

*To enable the commission to plan effectively for a changing legal and technological landscape, New York must update how it regulates the service provided by gas corporations.*¹⁸⁰

¹⁷⁷ *Id.*, 356.

¹⁷⁸ The Brattle Group, *The Future of Gas Utilities Series*, 11. August 2021.

¹⁷⁹ S&P Global, “NY governor’s budget gives regulators more power to phase out natural gas grid.”; Available from <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/ny-governor-s-budget-gives-regulators-more-power-to-phase-out-natural-gas-grid-80102868>. January 2024.

¹⁸⁰ 2024 NY Senate Bill S8308-A, Part P (247th NY Legis. Sess.); 2024 NY Assembly Bill A.8808-A, Part P (247th NY Legis. Sess.). 168. Accessed from <https://www.budget.ny.gov/pubs/archive/fy25/ex/artvii/ted-bill.pdf>.

3.5.2. Stakeholder & Company Feedback

AGREE refers to the NY PSC's order on NFG's LTP, in which the PSC states that "identifying segments of LPP that the Company can decommission rather than replace, by relying on NPAs, is critical."¹⁸¹

SC and EJ reiterate that the Final Scoping Plan confirms the need to downsize the natural gas system. They also point out that the CAC recommended "utility-specific forecasts for reducing gas sales, decreasing the number of gas customers over time and applying greater scrutiny to investments in the gas distribution system to ensure that investments do not result in stranded assets that make it even more expensive to reduce GHG emissions in the future."¹⁸²

Representatives of Fossil Free Tompkins, an organization based in Tompkins County, New York, presented a document in a Technical Conference on February 13, 2024, that outlined some key considerations for strategic decommissioning. The discussion focused on identifying all impacted groups and ensuring they are a part of the process, potentially reproducing a local decommissioning effort on a larger scale, and understanding the potential impacts on customers. Stakeholders were generally supportive of the effort. Local organizations and stakeholders will be critical in decommissioning efforts, making community support and education necessary.

Regarding strategic downsizing, the Companies' Reply Comments advocate for a variety of approaches such as a system-wide blend of hydrogen and RNG rather than only full electrification. They also quote the NY PSC's recent order approving the NYSEG and RG&E rate case JP, noting that the CLCPA does not contemplate a reduction in gas transmission and distribution infrastructure, only emissions, and that the purpose of the LTP is not to downsize gas transmission and distribution networks.¹⁸³ Additionally, they state that in order to downsize a section of the gas

¹⁸¹ AGREE, *Comments on the Initial LTP*, 5 – 6.

¹⁸² Sierra Club and Earthjustice, *Comments on the Initial LTP*, 5.

¹⁸³ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 6.

system, all load must be electrified on that part of the system and the targeted segment must be a “dead-end” of the system.¹⁸⁴

In their reply comments to the Revised LTP, NYSERDA states that “the Companies should integrate gas and electric system planning to promote targeted electrification and network retirement.” NYSERDA points out that 75% of customers for NYSEG and 85% of customers for RG&E are in overlapping gas and electric service territories. They emphasize that the Companies should coordinate further between gas and electric operations and increase coordination with other electric utilities that serve the Companies’ gas territories. “NYSERDA recommends that the Companies develop more proactive planning practices to identify segments of the gas system that are most suitable for retirement and establish plans to enable this retirement.”¹⁸⁵

Fossil Free Tompkins, in their comments on the Revised LTP, provided feedback to the Companies on a community-based plan to strategically downsize the gas system. Potential elements of the gas system contraction plan include development of annual GHG reduction targets, identification of specific C&I customers with large energy needs, scenario development, coordinated gas and electric planning, and others.¹⁸⁶

3.5.3. Findings

A gas LDC’s CapEx forecast is directly related to strategic downsizing, as it shows the level of investment an LDC is expecting to pursue in its gas distribution system.

For 2024-2026, the Companies used their forecast from the NYSEG and RG&E JP in Case 22-E-0317. For the years 2027-2043, the Companies’ CapEx forecast shows CapEx increasing by 2.1% annually due to inflation.¹⁸⁷ In a Technical Conference on January 25, the Companies confirmed that this CapEx forecast is treated as an input, so it is the same across all scenarios (other than very minor adjustments for avoided

¹⁸⁴ *Id.*, 18.

¹⁸⁵ NYSERDA, *Comments on the Revised LTP*, 19-20.

¹⁸⁶ Fossil Free Tompkins, *Comments on the Revised LTP*, 1-7.

¹⁸⁷ NYSEG and RG&E, *Final LTP Appendix B*, B-13. The 2.1% annual inflation figure for years 2027-2043 can be found in Table A-2.

meter/service CapEx).¹⁸⁸ CRA has further investigated the CapEx plan through various data requests.

CRA's initial inquiry was related to the fact that the Companies' LPM replacement program will be completed in the coming years, but CapEx is not expected to decrease at any point in the future in any scenario. The Companies stated they "anticipate capital investments to shift from the current concentration on LPPR program to other types of projects." These project types include mandatory government jobs, transmission gas main replacement, non-leak prone service replacement, gate and regulator station modernization and automation, and distribution main replacement.¹⁸⁹

If these other projects are currently included in the CapEx plan and a major component of them (the LPPR program) is rolling off by 2027, CRA then sought to understand why CapEx was not expected to decrease.¹⁹⁰ The Companies stated that spending will shifting from LPP to other types of projects and programs, but also that "the Leak Prone Pipe Replacement Program is anticipated to continue."¹⁹¹

The Gas Planning Order states that its goal is to "set up a flexible planning process that can incorporate the CAC recommendations when they are finalized, while requiring LDCs to develop plans to *limit infrastructure build*."¹⁹² Additionally, in the 2023 Order Adopting JP, the Commission reiterated its stance that the gas planning process should "ensure that gas utilities continue to provide safe and reliable gas

¹⁸⁸ NYSEG and RG&E, *Electric and Gas Price Forecasting Technical Conference*. January 25, 2024. Link to recording:
<https://meetny.webex.com/webappng/sites/meetny/recording/dc9ca86f9861103cbec700505681f83e/playback>.

¹⁸⁹ NYSEG and RG&E, Response to LTGP-23-080.

¹⁹⁰ Table E-13 on page E-13 of the Final LTP shows zero leak-prone main remaining in the NYSEG/RG&E gas systems by the end of 2029. The Companies have committed to have all leak-prone pipe replacement completed by 2030. See Rate Order, page 64.

¹⁹¹ NYSEG and RG&E, Response to LTGP-23-163.

¹⁹² NY PSC, *Gas Planning Order*, 19. Italicized for emphasis.

service while *reducing gas infrastructure* and GHG emissions in a manner consistent with the CLCPA.”¹⁹³

Given these statements, the regulatory environment in New York, and the fact that the pipe installed as part of the main replacement program has a depreciation life of 75 years, CRA questions the need to continue the LPPR Program beyond its planned completion.¹⁹⁴ CRA acknowledges that LDCs’ ability to capitalize NPAs in the future is a possibility that would impact the CapEx forecast, and CRA further acknowledges that additional capital investment may be necessary. However, the Companies have not provided sufficient information to support the current CapEx forecast that continues to increase over time (or a flat forecast if stripping out inflation) given the standard of reducing/limiting gas infrastructure established in the Gas Planning Order and reiterated in the Rate Order by the NY PSC.

In the LTP, NYSEG and RG&E discuss the lack of strategic downsizing in their LTP, citing fundamental policy and implementation questions that “must be resolved before incorporating potential reduced capital and O&M costs into the LTP.”¹⁹⁵ CRA acknowledges the various questions related to strategic downsizing, as discussed throughout this section. However, given the Commission’s intent on reducing gas infrastructure (see footnote 193) and focus on affordability, CRA does not believe these questions justify the Companies’ failure to develop a plan to strategically downsize in the LTP. While questions are outstanding about potential future downsizing, the LTP proceeding is precisely the venue that the Companies should look to start addressing some of these questions.

First, as customers electrify, it is critical to pair that electrification with a reduction in gas system infrastructure, such that remaining gas customers are not burdened with

¹⁹³ Rate Order, 52. Italicized for emphasis.

¹⁹⁴ Rate Order, Appendix Z, 2.

¹⁹⁵ NYSEG and RG&E, *Final LTP*, 102.

ever-increasing rates as more customers electrify.^{196,197} Strategic downsizing is critical for affordability purposes.

Second, in long-term gas planning proceedings, uncertainties are inherent for many future variables. For example, the cost of using hydrogen and RNG system-wide blends is uncertain at this time, as is the safety of hydrogen blending at the levels proposed by the Companies in their LTP. However, the Companies do model system-wide blends for hydrogen and RNG despite these uncertainties and unanswered questions. Additionally, is it worth noting that Con Edison indeed included a 70% reduction in CapEx in the Reference Pathway in its Final LTP, as well as reducing pipe replacement targets in their recent rate case which “reflects a recognition that gas usage will decrease and the system will be smaller in the future.”¹⁹⁸ The Con Edison CapEx forecast is discussed further in Section 3.6.4.

Regarding the Companies’ discussion of using a variety of approaches to achieve GHG reductions, CRA notes that strategic downsizing is still possible without a long-term plan that *only* models electrification. While there are questions about the viability, emissions reductions, and cost of supply-side options of RNG and Hydrogen (please see Sections 3.7 and 3.8), downsizing a gas system and including these supply-side options are not mutually exclusive.

The Companies’ model 100% of customer conversions in each class (residential, commercial, and industrial) in the same way – that is, each customer that converts from a gas furnace or boiler is assumed to take the same action.¹⁹⁹ However, in the future, a mix of various options is likely to occur. Some customers may opt for a hybrid

¹⁹⁶ CRA acknowledges that the current LTP for NYSEG/RG&E does not model any full electrification. However, CRA’s recommendation in Section 3.10 of this report includes some level of full electrification. It is critical to develop and model a plan for strategic downsizing so that customers are not burdened with associated increased rates.

¹⁹⁷ The concept of rate increases due to customers leaving the gas system is further explained in Section 3.6.1.

¹⁹⁸ Consolidated Edison Company of New York, Inc. and Orange & Rockland Utilities, Inc., *Gas System Long-Term Plan*. 71. NY PSC Case 23-G-0147. November 29, 2023.

¹⁹⁹ NYSEG and RG&E, *Final LTP*, 94 – 96. This reference is to the LTP Building Electrification plan, which is for all converting customers to convert to a hybrid heating system.

heating system, while others will fully electrify, especially due to incentives and potential cost reductions in heat pump technology over time (discussed throughout this report). As customers fully electrify, the Companies can take advantage of this by opting to strategically downsize the system in certain areas.

The Companies' LTP does not forecast any customer conversions to full electrification, instead opting for the hybrid heating system with a gas furnace as a backup.²⁰⁰ Assuming that all customers remain reliant on the natural gas system inherently means that virtually no downsizing of the system is possible. CRA acknowledges the unique climate conditions that exist throughout NYSEG and RG&E's service territory and that customer preference plays an important role in the decarbonization process. However, forecasting that all customers opt for the use of the Companies' hybrid heating system approach is not appropriate. A combination of the different possible approaches should be used in the LTP. Governor Hochul has already announced plans for two million homes to be electrified or electrification ready by 2030.²⁰¹ This two-million number represents approximately 26% of the current number of occupied homes in New York.²⁰² Additionally, Governor Hochul's plans are for 2030, and as the NYSEG/RG&E's LTP planning horizon runs through 2043, it should be expected that electrification will continue to occur throughout their service territories.

Indeed, in their January 2024 Energy Efficiency Portfolio report, the Companies have acknowledged that "The long-term vision of the CLCPA is to convert all homes to electric heating."²⁰³

²⁰⁰ *Ibid.*

²⁰¹ NYSERDA, Press Release, "Governor Hochul Announces Plan to Achieve 2 Million Climate Friendly Homes by 2030." Available from <https://www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-01-05-Governor-Hochul-Announces-Plan-to-Achieve-2-Million-Climate-Friendly-Homes-By-2030>. January 2022.

²⁰² New York State, "New York State Housing Statistics." Available from <https://www.governor.ny.gov/new-york-state-housing-statistics>.

²⁰³ NYSEG and RG&E, "Energy Efficiency Portfolio Proposal," 41. Available from <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C093FF8C-0000-C75A-A771-B16CE298C755}>.

Changes to the gas utility business model are important to consider as they could increase the likelihood of an effective strategic downsizing plan, providing incentives for the utility that may not currently exist, especially for gas-only utilities. For example, a utility could potentially own electrification equipment such as heat pumps and lease the equipment to customers under a “Comfort as a Service” offering.²⁰⁴ In the case of a geothermal system, the utility could potentially own, operate, and maintain systems to allow utilities to continue to transform their rate base as New York transitions away from natural gas.

Stakeholders and CRA have recommended six additional scenarios that the Companies have run. Four of these scenarios include full electrification approaches with strategic downsizing. Please see Section 3.18 for further discussion of the scenarios.

3.5.4. Recommendations

While the Companies project CapEx to rise with inflation each year post-2026, Con Edison’s recently filed final LTP takes a very different approach. The Reference Pathway reflects today’s legal and policy framework, does not reduce GHG emissions at a level that achieves CLCPA statewide reductions targets, and assumes limited regulatory, technological, and market changes over the forecast period.^{205,206} This Reference Pathway projects a 70% decrease in CapEx over the 20-year forecast period for Con Edison. This Reference Case forecast reflects the completion of Con Edison’s Gas Infrastructure Reduction or Replacement Program. Con Edison agreed to reduce the mileage targets under this program in their most recent rate case, a decision that “reflects a recognition that gas usage will decrease and the system will

²⁰⁴ A description of Comfort as a Service can be found here: <https://reliableair.com/promo>.

²⁰⁵ Consolidated Edison Company of New York, Inc. and Orange & Rockland Utilities, Inc, *Gas System Long-Term Plan*, 67 – 68. NY PSC Case 23-G-0147. Nov 29, 2023.

²⁰⁶ CRA acknowledges these CLCPA emissions reduction targets are economy-wide for all of New York State, rather than specific to gas utilities. On pages 67 – 68, Con Edison’s Final LTP describes the Reference Pathway as “[reflecting] today’s legal and policy framework which implement important first steps even if they do not achieve State or city economy-wide net zero greenhouse gas emissions reduction goals.”

be smaller in the future” according to their Final LTP.²⁰⁷ Their Hybrid Pathway, which meets statewide GHG goals but retains a gas connection for certain difficult-to-electrify buildings, projects CapEx to decrease by approximately 79% over the 20-year forecast period.²⁰⁸

The Companies’ LTP disadvantages the Full Electrification scenarios by assuming the same level of capital investment would be necessary despite a reduction in customer count over time. CRA recommends the Companies develop scenario-specific CapEx forecasts for the LTP and each alternative scenario, showing a substantial decrease in CapEx in their full electrification scenarios reflecting downsizing opportunity with a shrinking customer base, similar to the methodology used by Con Edison in their LTP.

In Section 3.10.4, CRA recommends that the Companies assume a portion of their customer base fully electrifies in the LTP. In accordance with this recommendation, CRA advises that the Companies update their CapEx and operating costs forecast to reflect potential downsizing opportunities as customers fully electrify in the LTP.

In addition to a reduction in CapEx and operating costs, strategic downsizing would also benefit the LTP by further reducing emissions. Page E-10 of Appendix E shows that the calculation of methane and CO2 emissions are both dependent on miles of pipe in the gas system. As downsizing reduces total mileage of pipe in the gas system, it further reduces emissions. This reduction in infrastructure would be captured via the Companies’ BCA calculations.

The NY PSC advocates for LDCs to take a “neighborhood approach” when evaluating and implementing NPAs.²⁰⁹ Areas where LPP exists that would typically require traditional infrastructure can instead be addressed by an NPA. The Companies can supplement these efforts of increasing their NPA activity in the future by identifying segments of gas pipe that are serving few remaining customers due to high levels of

²⁰⁷ Consolidated Edison Company of New York, Inc. and Orange & Rockland Utilities, Inc., *Gas System Long-Term Plan*, 70. NY PSC Case 23-G-0147. Nov 29, 2023.

²⁰⁸ *Id.*, 79.

²⁰⁹ NY PSC, *Gas Planning Order*, 39.

electrification and use those opportunities to retire segments of pipe and downsize the system.

The Gas Planning Order requires LDCs to identify the locations of specific segments of LPP that could potentially be abandoned in favor of an NPA within their Annual Update filed subsequent to their Final LTP.²¹⁰ CRA recommends the Companies identify these segments in their LTP rather than wait until the Annual Update and consider these segments in the context of strategic downsizing.

As per the Technical Conference on February 13th discussed in Section 3.6.2, stakeholders are supportive of the Companies' beginning to identify these potential areas for decommissioning. As recommended by stakeholders during this technical conference, CRA also recommends that a pilot program be developed to determine the best approach for downsizing a specific area of the distribution system. This should be an exercise conducted with customers and stakeholders (including local community members) to define the issues, barriers, and costs associated with eliminating service in a small, defined region, and working with customers and stakeholders to assess its viability. This effort should be performed together with the NPA evaluation discussed previously. Successfully implementing a pilot program of this nature would provide NYSEG/RG&E and other gas utilities, regulators, and stakeholders with critical information. It would help determine the best path forward to strategic decommissioning and potentially provide a model for other areas.

Additionally, CRA recommends the Companies develop a joint planning approach across their electric and gas companies to develop the most cost-effective and efficient solutions for customers and the Companies to support strategic downsizing and increased electrification. In their Implementation Plan in the Final LTP, the Companies do discuss developing a joint planning approach, as recommended here.

²¹⁰ *Ibid.*

3.6. Renewable Natural Gas

3.6.1. Background

RNG is biogas that has been processed to become pipeline-quality gas. Four primary feedstocks of RNG are considered in the Companies' Revised LTP, including landfill gas, animal manure, food waste, and wastewater (municipal sewage treatment facilities). All these sources produce biogas through anaerobic digestion. Other potential sources of biogas, such as thermal gasification, are not considered in the Companies' current analysis because they will not be market-ready in the required timeframe based on the Companies' assessment. The Companies have indicated these sources will be re-evaluated in future LTPs.

The Gas Planning Order requires that the LDC quantify the available supply within the service territory or region. It is also expected that preference should be given to RNG produced locally, which will also provide some benefits for supply reliability and regional emissions reduction.²¹¹

What is not determined at this time is how RNG should be included in the supply portfolio and the relative value of emissions reduction that should be assigned for RNG. The CAC has suggested that additional research, development, and demonstration is required to further assess the potential supply, and to provide agreed upon approaches for life cycle GHG accounting.²¹² Mechanisms for providing incentives for RNG also need to be addressed. Further guidance from Staff and the CAC will be required on this matter and will influence future LTPs.

3.6.2. Stakeholder & Company Feedback

AGREE states that the Companies' RNG scenarios are unrealistic, citing the improbable assumption that they will procure "100% of all RNG from animal waste, food waste, and landfills, and 50% of RNG from waste treatment centers" within their service territories, as well as "2% of all RNG in Pennsylvania and Ohio for each utility"

²¹¹ NY PSC, *Order Adopting Gas System Planning Process*, May 12, 2022, 32.

²¹² CAC, *Climate Action Council Final Scoping Plan*, 213.

and yet the Companies are only “monitoring” RNG development rather than facilitating production or securing resources at the current time.²¹³ AGREE says, “it is currently unreasonable to assume a central role for RNG in the Companies’ long-term gas plan and any cost estimates relying on large amounts of RNG should be treated with a high level of skepticism.”²¹⁴

SC/EJ cite many concerns with the Companies overreliance on RNG, including RNG’s scarcity and expense—two things their LTP does not consider.²¹⁵ But SC/EJ note that the problems with the Companies’ RNG dependence go further than this. The Companies predict an unreasonable availability of RNG supply and overstate the emissions benefits associated with replacing fossil gas with RNG.²¹⁶ SC/EJ believe delaying electrification by relying on RNG will be more expensive, as the Companies will need to continue to invest in the distribution system, whereas a direct-electrification plan would allow customers to avoid paying into a system that will need to be retired to meet future compliance requirements.²¹⁷ In line with other commenters, Strategen says, “the Companies’ RNG assumptions are excessively risky.”²¹⁸

The Companies begin their reply comments by addressing the comments by multiple stakeholders stating that RNG is too expensive and should not be considered. The cost of RNG ranges from \$11.29 to \$34.56 per one million BTU (“MMBtu”), compared to \$3.50 to \$5.00 for fossil gas.²¹⁹ The Companies believe that it is more appropriate to compare the cost of RNG to other decarbonization measures, such as electrification, rather than to fossil gas. They also state that the adoption of RNG will be for a limited supply, rather than a full replacement of natural gas. NYSERDA has provided

²¹³ AGREE, *Comments on the Initial LTP*, 3.

²¹⁴ *Id.*, 3 – 4.

²¹⁵ SC/EJ, *Comments on the Initial LTP*, 25-26.

²¹⁶ *Id.*, 28, 14-15.

²¹⁷ *Id.*, 15.

²¹⁸ Strategen, *Comments on the Initial LTP*, 10.

²¹⁹ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 37.

additional comments regarding RNG production costs, pointing out that this represents the forecast for cost of production, and not what the market price may be, which would need to factor in the potential environmental attribute value.

The Companies address Stakeholder comments on the availability issue as well. They point out that the assumptions driving RNG availability are from the ICF study for NYSERDA and the American Gas Foundation. They state that ICF estimates a maximum potential for RNG, as well as providing other scenarios such as “optimistic growth” and “achievable deployment.” The Companies say that the RNG will not be acquired at the maximum potential levels, but at optimistic growth and achievable deployment scenario levels.

The Companies respond to SC/EJ’s points stating that they overstate the amount of RNG that is projected in the LTP. They state that they are using scenarios from the ICF study that are less than the full RNG potential. The Companies conclude that “over the next several years, more will be learned about the development and evolution of the RNG (and heat pumps/weatherization) markets, which will be reflected in future LTPs.”²²⁰

Lastly, the Companies reply to comments related to the emissions associated with RNG. They state that emissions from RNG are captured on a life-cycle basis, which is consistent with the Final Scoping plan and other standards such as the California Low Carbon Fuel Standard. Additionally, different RNG feedstocks are assumed to have different levels of emissions reductions. The Companies disagree with SC/EJ, who contend that a gross, rather than net, emissions accounting methodology should be used, as well as arguing that out of state RNG should not be considered towards the Companies’ GHG reduction goals.

The Companies believe that since emissions accounting is not a fully developed policy matter and the Commission has not ruled on RNG emission accounting specifics, the approach taken is valid. They also assert that GHG reductions in Ohio and

²²⁰ *Id.*, 40.

Pennsylvania should not affect their LTP and should be included in the calculation of emissions reduction in the BCA. The Companies cite the NFG LTP Order, in which “the Commission has generally accepted RNG as a method of reducing emissions.”²²¹

In their comments on the Revised LTP, NYSERDA makes several points on RNG. First, NYSERDA brings up that RNG’s potential as a decarbonization initiative is highly sensitive on its assumed emission factor. NYSERDA references the “Fossil and Biogenic Fuel Greenhouse Gas Emission Factors” report, which states an RNG emission factor of 122.1 lb CO₂e/MCF.²²² This is in contrast to the Companies’ estimate of -49.8 lb CO₂e/MCF. This results in a delta of 171.9 lb CO₂/MCF. This delta will be extremely significant, given the Companies’ reliance on RNG as a decarbonization measure. NYSERDA states that “The cost-effectiveness (\$/MT CO₂e) calculation differs by a factor of ~2.8 depending on the EF. A difference of this magnitude could impact the decarbonization strategy pursued in the LTP.” NYSERDA recommends that the Companies provide Climate Act-compliant GHG accounting results to understand how the LTP scenario aligns with State emission reduction requirements.²²³

SC/EJ also raise concerns about the Companies’ RNG assumptions in their comments on the Revised LTP. They reiterate some concerns expressed in their comments on the Initial LTP, and agree with CRA on many of their comments in the Preliminary Findings Report. SC/EJ states that the Companies assume that RNG will be available to them at the cost of production, which is assumed to be \$11.29 per MMBtu, adjusted for inflation. They assert that this is unreasonable, as the Companies do not own the production, and will likely be unable to buy it at cost. They add that other factors will play into the price of gas, such as credits from programs such as the California LCFS and the Federal Renewable Fuel Standard. Thus, SC/EJ believe that the true cost of

²²¹ *Id.*, 43.

²²² NYSERDA 2022 (Revised May 2023). “Fossil and Biogenic Fuel Greenhouse Gas Emission Factors,” NYSERDA Report Number 22-23. Prepared by Energy and Environmental Economics, Inc. (“EF Report”). Available at: nyserdera.ny.gov/About/Publications/Energy-Analysis-Reports-and-Studies/Greenhouse-Gas-Emissions.

²²³ NYSERDA, *Comments on the Revised LTP*, 9-11.

RNG to the Companies will be greater than \$11.29 per MMBtu and “the Companies must include the true cost and climate impacts of RNG in their Final LTP.”²²⁴

In their comments on the Revised LTP, AGREE reiterates some points from their comments on the Initial LTP and supports the CRA recommendation that RNG be used only in hard-to-electrify applications.²²⁵

3.6.3. Findings

The Companies’ LTP has assumed a significant role for RNG and provides details on the availability of RNG as a supply resource. It also outlines the quantity of RNG that will be used in each of the four NYSEG/RG&E scenarios and the LTP. While the LTP recognizes that costs are site-specific, it uses average cost assumptions for New York State for each of the feedstocks from a report commissioned by NYSERDA and a separate report commissioned by the Companies in 2021.²²⁶ The costs are summarized in Table A-40 of the Final LTP Appendix A. The Companies also note they have adjusted production costs for inflation in their modeling. The emissions factors used for RNG are based on a 20-year Global Warming Potential (“GWP”) and are summarized in Table A-41 of the Revised LTP Appendix A. These assumptions are sourced from the NFG LTP.²²⁷

For each of the four categories of RNG feedstocks, the Companies have developed estimates of how much of the resource will be available to them based on the following scenarios:

- **Technical Potential** – defined as the amount of RNG that could be produced at 100% of production.

²²⁴ Sierra Club and Earthjustice, *Comments on the Revised LTP*, 3-6.

²²⁵ AGREE, *Comments on the Revised LTP*, 2.

²²⁶ ICF Resources, *Potential of Renewable Natural Gas in New York State prepared for New York State Energy Research and Development Authority*, NYSERDA Report Number 21-34, April 2022, 44; NYSEG and RG&E, *Renewable Natural Gas Study*, August 2021.

²²⁷ NFG, *National Fuel Final Long Term Plan Appendix A*, July 17, 2023, Table A-34.

- **Optimistic Growth Scenario** – defined as the amount of RNG that could be produced from facilities under an optimistic development scenario, as defined in the NYSERDA RNG study conducted by ICF. This is the basis for the assumptions for the Companies' CLCPA scenarios.
- **Achievable Deployment Scenario** – defined as the amount of RNG that could be produced given more conservative assumptions. These are the assumptions used for the Delayed Achievement Scenarios, as defined in the ICF NYSERDA RNG study.²²⁸

Details of how the assumptions were developed for the technical potential of each resource are discussed in Appendix A, Section XI of the Revised LTP. A summary of some of the specific assumptions is provided below:

- Landfill Gas – assumptions are based on identified landfill gas facilities within the Companies' service territory and identified as "Landfill Gas Recovery Facilities" by the New York State Department of Environmental Conservation.²²⁹
- Animal Waste – assumptions are based on cattle headcount data from the 2019 New York State Dairy Statistics Report.²³⁰
- Food Waste: assumptions for technical potential are based on estimates developed from population estimates within the Companies' service territories.

²²⁸ ICF Resources, *Potential of Renewable Natural Gas in New York State prepared for New York State Energy Research and Development Authority*, NYSERDA Report Number 21-34.

²²⁹ New York State DEC, *Policy DMM-SW-04-16 Landfill Gas Collection and Treatment Systems*, February 11, 2004.

²³⁰ New York State Department of Agriculture and Markets, *2019 New York State Dairy Statistics Report*, Table 3, 2019.

- Wastewater: assumptions based on identified number of wastewater treatment plants within the Companies' service territories, using data from the New York State Department of Environmental Conservation.²³¹

The Companies used 100% of the four feedstocks for the optimistic growth and achievable development scenarios from the ICF study results as the basis for their assessment. The Companies are also assuming that they can access 2% of the available four anaerobic digestion feedstocks in Pennsylvania and Ohio in the Companies' CLCPA Scenarios and 1% in the Delayed Achievement Scenarios, based on ICF's optimistic growth scenario.

The LTP RNG supply assumptions are based on ICF's Optimistic Growth Scenario, which are the same assumptions used for the Companies' CLCPA scenarios. The LTP also assumes the Companies can access 2% of the RNG produced in Pennsylvania and Ohio.²³²

Based on CRA's assessment of the LTP and methodology, the approach to developing a system-wide blend appears to be reasonable overall, but the basis for some of the assumptions for the LTP appear to be very aggressive and would require a significant level of effort and investment to develop and secure the supply over the next five years.

The supply curves provided in Appendix A, Section XI of the LTP show all four of the resources rapidly increasing production by 2029, then leveling off in the future at a relatively constant level because they will have reached the maximum supply available. Based on the Companies' current activity, which focuses on monitoring the market, it does not seem likely they will be in a position to meet the supply as included in the Revised LTP.

²³¹ New York State DEC *Wastewater Treatment Plants Dataset*, February 15, 2023.

²³² NYSEG and RG&E, *Final LTP*, 69.

The best applications for RNG are still a matter of debate, but neither the CLCPA nor the CAC currently provide specific direction on whether RNG should be used as a system-wide blend or targeted toward difficult-to-decarbonize applications.

It should be noted that the impacts of emissions accounting on utility planning is not fully developed yet in New York and that the Commission has not weighed in on all aspects of RNG accounting specifically. While a single RNG project is quite different than a system-wide RNG blend, CRA notes that the Commission has generally accepted RNG as a method of reducing overall NYS emissions, as demonstrated in the Bluebird Order.²³³ The Commission has not established a mechanism for recognizing the value of the environmental attributes associated with RNG. Additionally, the Bluebird Order emphasized electrification as beneficial.

Stakeholders have noted the challenges associated with achieving the supply levels the Companies have modeled, and they characterize this plan as risky and expensive. They also have pointed out that reliance on blending RNG to achieve decarbonization goals has the potential to delay opportunities to strategically retire portions of the gas network.

In the Order Implementing NFG Distribution Corporation's Long-Term Natural Gas Plan with Modifications in Case 22-G-0610, the Commission directed NFG to monitor the evolution of the RNG market purchase/interconnection data in its Annual Updates and its next LTP. The Commission noted that RNG is typically more costly to produce than fossil natural gas, and also noted that credits paid to producers participating in federal or out-of-state low carbon or renewable fuel programs offset those costs and encourage production.²³⁴

²³³ Case 21-G-0576, Petition of Bluebird Renewable Energy, LLC for an Original Certificate of Public Convenience and Necessity and Establishing a Lightened Regulatory Regime, Order Granting Certificate of Public Convenience and Necessity and Providing for Lightened Regulation (issued November 18, 2022) (Bluebird Order), 27.

²³⁴ NFG LTP Order, 32.

However, as stakeholders have stated throughout the process and most recently in the Strategic Downsizing Technical Conference on February 13, if RNG attributes are purchased outside of the state, then that RNG may not contribute to GHG emissions reductions within the state of New York. As Staff clarified, the Commission has not yet ruled on the accounting of the cost of RNG attributes.²³⁵

While the Companies are not currently purchasing environmental attributes for RNG, they do plan to begin purchasing these attributes starting in 2026.²³⁶ This would require the Companies to develop an approach for accessing the emissions reduction credits in a way that does not unduly burden ratepayers. In the current LTP, the cost of RNG is based on the cost of production and does not include any additional environmental or market value. Therefore, the current cost assumptions are likely to underestimate the actual cost of purchasing RNG with the environmental attributes.

3.6.4. Recommendations

The Companies' LTP includes a significant level of RNG in the LTP – a level that is aligned with the Companies' CLCPA scenario. This scenario is based on a 100% optimistic growth scenario from the NYSERDA ICF study which includes the following:

- RNG could be produced at 65% of the landfill gas facilities that have collection systems in place and at 75% of the candidate landfills, and 2% of the available landfill gas production in Ohio and Pennsylvania;
- After accounting for the technical availability factor, 60% of the available manure remained and could be used to produce RNG and 2% of the available animal waste gas production in Ohio and Pennsylvania

²³⁵ NYSEG and RG&E Technical Conference on Strategic Downsizing. February 13, 2024. See the project SharePoint for all Technical Conference notes.

²³⁶ NYSEG and RG&E, Responses to LTGP-23-031, LTGP-23-182, and LTGP-23-183.

- 70% of available food waste and food processor waste would be diverted to AD systems and 2% of the available food waste gas production in Ohio and Pennsylvania
- 50% of the wastewater treatment plant gas production from facilities with a capacity of greater than 3.3 MGD.

To achieve the level of RNG production described in the LTP, the Companies would need to begin to develop the resources immediately and secure supply within their service territory, as well as investigate the approaches for securing supply from out-of-state (in Pennsylvania and Ohio). This would require developing a plan, defining the required investment level, the approach for procuring the environmental credits, and mechanisms for cost recovery. Currently, there is no mechanism established for recognizing the environmental value or obtaining cost recovery for this environmental value in New York.

The Companies should provide more discussion and detailed investigation into the actual cost for acquiring each type of resource, including the environmental credits. As pointed out in the comments from SC/EJ, it is unlikely that the Companies will be able to acquire RNG at the forecasted production cost levels that are assumed in the ICF report.²³⁷

It is possible that this mechanism will be addressed in the NYCI Program, but the Commission has not made any decisions about these issues at the current time. The animal waste and food waste categories appear to be particularly challenging market segments from which to develop supply at the level required due to the complexity of developing numerous agricultural digester projects and connecting them to the pipeline network.

The Revised LTP uses the Optimistic Scenario of a recent NYSERDA study conducted by ICF for estimating the RNG market. Given the current state-of-market development

²³⁷ ICF Resources, *Potential of Renewable Natural Gas in New York State prepared for New York State Energy Research and Development Authority*, NYSERDA Report Number 21-34, April 2022.

and the complexity of developing supply, including the development of a viable approach for cost effectively purchasing the environmental credits, it may be more appropriate to consider using the Achievable Deployment scenario to estimate supply. It is also likely that there will be competition for the available supply, as other market segments emerge, such as transportation or industrial consumers, who are looking for approaches to reduce GHG emissions. It is also likely that the timing required to ramp up production and supply from these facilities will take much longer than forecast in the LTP and Company scenarios. Figures A-3, A-4, A-5, and A-6 forecast steep increases in supply from 2028, through 2029, which would appear to be unrealistic. CRA recommends that a more realistic ramp up in supply be considered if the Companies continue to include similar levels of RNG supply in the LTP.

The current plan as described in Chapter VII of the LTP discusses a learning program that will focus on “monitoring the evolution of the RNG market.” The RNG market in New York may become competitive, as other companies and applications compete for the available supply and the associated renewable fuel value as a low carbon fuel source. For example, the transportation market has a more established renewable fuel standard and could compete for these resources. This will likely limit the Companies’ ability to achieve their forecasted level of supply.

Based on CRA’s assessment of the current RNG supply plan and risks identified by stakeholders, CRA recommends that RNG supply be targeted only to hard to electrify end-use market segments, such as industrial processes that require natural gas. As described in Chapter VII (“Conclusions and Implementation Actions”) of the LTP, discussions with major industrial customers will help the Companies determine the potential for this use case. This may also require the development of a transition plan for these customers to allow them to procure RNG in this manner. The NYCI program may help to provide further clarity on this process.

CRA also recommends that the Companies do not employ a system-wide blend, and the cost of blending RNG supply be removed from the overall cost of gas supply in the LTP. Based on the uncertainties of supply and cost, it would not appear to be reasonable for these costs to be passed along to residential, commercial, and municipal customers that may have alternative means available for reducing their

natural gas consumption. This approach has been recommended for the six additional scenarios developed by CRA and stakeholders outlined in Section 3.18.

CRA also recommends that the Companies continue to investigate RNG supply options and costs while working with their customers that do not have alternatives to natural gas for reducing GHG emissions. In this way, as they develop supply, they will also be developing the end-use market, and can work with these customers to assess their willingness and ability to pay any required premium for RNG, including the environmental credits associated with the supply, in a way that does not unduly burden ratepayers.

3.7. Hydrogen

3.7.1. Background

Hydrogen is an emerging supply option that is being explored for the role it might play in reducing GHG emissions. Ultimately, hydrogen may serve as a method of delivering low-carbon fuel to customers, potentially using the same infrastructure that natural gas currently flows through. In this regard, it is an attractive option for gas utilities to explore, as it could potentially allow them to continue the use of their infrastructure and retain their customer base.

Various hydrogen-related issues must be addressed in the future and will require more analysis including GHG emissions reduction accounting for the various forms of production (blue, green, pink, etc.) as well as blending, supply, pipeline operations, and safety matters. The CAC provided similar comments in its Final Scoping Plan.²³⁸

Many questions surrounding hydrogen have yet to be answered. For example, there is uncertainty related to the cost of the hydrogen production, the cost of potential natural gas system upgrades that would be necessary to make the system hydrogen-ready, the framework of hydrogen regulation, and most importantly, the maximum level

²³⁸ CAC, *Climate Action Council Final Scoping Plan*, 31, 78, 104, etc.

of hydrogen blending that would allow utilities to deliver hydrogen safely and reliably and not significantly interfere with customer equipment operation.^{239, 240, 241, 242}

What is not in question is the fervent optimism that certain states and the federal government have for hydrogen as a method of decarbonizing. The U.S. Inflation Reduction Act (“IRA”) and Bipartisan Infrastructure Law (“BIL”) incentivize the development of hydrogen production, storage, and transportation. Additionally, the U.S. Department of Energy recently awarded up to seven billion dollars of funding to seven different hydrogen projects (out of 79 applicants) across 16 states. This funding will serve to create hydrogen hubs, which will ultimately help the U.S. further advance its position in the hydrogen industry and learn more about how it can be used as a key tool to decarbonize.²⁴³ It is noted that the proposed Northeast Regional Clean Hydrogen Hub that included many companies and applications in New York, including Avangrid, was not a finalist in the awards for the DOE funded program.²⁴⁴

Ultimately, it is likely that hydrogen will play some type of role in decarbonizing the economy and contribute to New York meeting its CLCPA goals. Whether that role will be in the form of a system-wide blend operated by LDCs or a more targeted use for industrial customers is uncertain at this time.

²³⁹ Hydrogen Council, *Path to Hydrogen Competitiveness: A Cost Perspective*, 2020. Available from: https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness_Full-Study-1.pdf; accessed November 20, 2023.

²⁴⁰ Powers, Jr., Hicks, Bogliano. *The Hydrogen Pipeline Debate Requires Candid and Serious Consideration of Existing Regulatory Regimes*. Energy Bar Association. April 18, 2023. Available from <https://www.eba-net.org/the-hydrogen-pipeline-debate-requires-candid-and-serious-consideration-of-existing-regulatory-regimes/>; accessed November 4, 2023.

²⁴¹ The California Public Utilities Commission, *Hydrogen Blending Impacts Study*, July 18, 2022. Available from <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF>; accessed November 4, 2023.

²⁴² Fazeli, Beck, Stocks, *Recognizing the role of uncertainties in the transition to renewable hydrogen*, Zero Carbon Energy for the Asia-Pacific Grand Challenge, March 2021.

²⁴³ Hedreen, Siri, *Biden administration picks 7 hydrogen hubs as winners of \$7B in grants*, S&P Capital IQ, October 13, 2023.

²⁴⁴ Energy.gov, *Regional Clean Hydrogen Hubs Selections for Award Negotiations*, url: <https://www.energy.gov/oced/regional-clean-hydrogen-hubs-selections-award-negotiations>

3.7.2. Stakeholder & Company Feedback

AGREE's Comments on the Initial LTP state the Companies' plan for hydrogen is inefficient and costly, noting that "[u]tility-scale use of hydrogen blending is currently undeveloped, with concerns about cost and safety, and reliability are very much unresolved."²⁴⁵ Specifically, AGREE states that the Companies' assumption to blend up to 20% hydrogen into their distribution system is too high to be considered safe and would pose cost concerns that are not accounted for in the plan.²⁴⁶ AGREE states,

*The price, safety, and reliability of hydrogen in a utility's gas distribution system are all open questions, and the use of renewable electricity to create hydrogen for customers who can electrify is inefficient. There is enough evidence to suggest that widespread use of hydrogen is not a feasible pathway for gas utilities, especially when efficient options for electrifying heating and cooking exist for many customers. We request that the Companies remove hydrogen blending from their proposal and that no rate-payer money is wasted on funding pilot programs.*²⁴⁷

Ratepayer and Community Intervenor likewise state in its Comments on the Initial LTP that hydrogen usage is "unsafe, not necessary, and expensive."²⁴⁸ Ratepayer and Community Intervenor further note the Companies' inconsistency in modeling outdated heat pump technology while relying on hydrogen, which is "totally speculative at this point."²⁴⁹

SC/EJ state in their Comments on the Initial LTP, that "[a]lternative combustion fuels. . . will not allow New York to achieve its climate mandates" because a switch to alternative fuels such as hydrogen or RNG does not "lead to the necessary downsizing of the gas system."²⁵⁰ But beyond this concern, SC/EJ believe the Companies do not

²⁴⁵ AGREE, *Comments on the Initial LTP*, 4.

²⁴⁶ *Id.*, 4-5.

²⁴⁷ *Id.*, 4.

²⁴⁸ Ratepayer and Community Intervenor, *Comments on the Initial LTP*, 2.

²⁴⁹ *Ibid.*

²⁵⁰ Sierra Club/Earthjustice, *Comments on the Initial LTP*, 24.

accurately represent the cost of using hydrogen at a high blending rate which would require system upgrades that have not been accounted for in the LTP.²⁵¹

Quoting an order from Massachusetts DPU, SC/EJ state, “significant research is necessary before hydrogen feasibly could be injected into an LDC’s distribution system,” citing electrification as a better option.²⁵² Hydrogen blending may not even be feasible, but if it is, and “even if green hydrogen’s cost declines, it is inherently less cost-effective than electricity, since the green hydrogen production process requires electricity as an input.”²⁵³

Strategen also questions the Companies plan to use a 20% hydrogen blend on their system, citing research that states blends greater than 10% can result in pipeline embrittlement and permeation.²⁵⁴ But NYSEG and RG&E do not account for such costs. “The Companies must address numerous pipeline deficiencies within their systems that limit hydrogen blending, including the potential for hydrogen embrittlement in steel piping and hydrogen permeability and leakage in plastic piping.”²⁵⁵

The Companies respond to stakeholders’ criticisms of the usage of hydrogen in the LTP. Specifically, they refer to claims that blending up to 20% could be unsafe, not cost effective, and more energy intensive than alternative decarbonization options. The Companies respond by stating that the 20% assumption is based on current technology, and it is even possible that technology will improve before 2043 to allow for greater volumes to be blended. They also state that they will complete another LTP before 2028, when Hydrogen blending is projected to begin, so they will have plenty of time for adjustments and further considerations.

²⁵¹ *Id.*, 29-30.

²⁵² *Id.*, 24-25.

²⁵³ *Id.*, 31-32.

²⁵⁴ Strategen, *Comments on the Initial LTP*, 10-11.

²⁵⁵ *Id.*, 21.

The Companies also respond by stating that multiple LDCs in the US, such as Hawaii Gas and New Jersey Natural Gas, are currently blending hydrogen into distribution systems. They add that National Grid has proposed a hydrogen blending project in their current rate case. They assert that “there is also no evidence that blending of up to 20% hydrogen in 2043 will be unsafe or require costly pipe replacements.”²⁵⁶ The Companies then assert that hydrogen enriched natural gas is one of the least expensive decarbonization options. They admit that there are uncertainties associated with hydrogen, but state that is the case with all decarbonization actions.

NYSERDA states in their comments on the Revised LTP that “further analysis of hydrogen’s role in the future of the gas system is necessary.” They note that a more substantive assessment of risks of leaks and explosions, pipeline maintenance and leak detection, appliance and piping, and increased NO_x pollution is required. NYSERDA recommends t“at “the Companies should consider developing a strategy that aligns with other State efforts to build clean hydrogen markets, particularly for the most difficult-to-electrify end uses such as medium and heavy-duty transportation, industrial processes, or electricity reliability through grid firming or long-term energy storage applications.”²⁵⁷

In their comments on the Revised LTP, Sierra Club and Earthjustice agree with CRA’s comments on the feasibility of hydrogen blending. They add that “there is no reason to believe that the Companies’ plan to blend hydrogen up to 20% is even possible, let alone a prudent investment of ratepayer money.”²⁵⁸

AGREE reiterates some points on hydrogen in their comments on the Revised LTP. They cite that studies have raised concern about system upgrade costs with a 5% blend of hydrogen, so it would be unreasonable for the Companies to assume zero system upgrade costs at a 20% blend. AGREE also agrees with CRA

²⁵⁶ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 46.

²⁵⁷ NYSERDA, *Comments on the Revised LTP*, 11.

²⁵⁸ Sierra Club and Earthjustice, *Comments on the Revised LTP*, 6-7.

recommendations to use hydrogen in direct, hard-to-electrify applications rather than in a system-wide blend.²⁵⁹

3.7.3. Findings

The Companies propose a system-wide blend of hydrogen in all scenarios and their LTP. The Companies' CLCPA Scenarios start blending hydrogen in 2028 at an incremental rate of 1.25% per year. The Delayed Achievement Scenarios start blending hydrogen in 2030 at an incremental rate of 1.0% per year. The LTP strategy for hydrogen is consistent with the Companies' CLCPA Scenarios. The LTP assumes a max of 20% blend by volume in 2043.^{260, 261}

In the LTP, no costs are allocated to updating the natural gas system and/or end-use appliances to allow for the system-wide blending of hydrogen.²⁶²

The Companies' claim that "Current technology and the current composition of the U.S. gas distribution system suggests that up to 20% hydrogen could be blended into natural gas systems" is being discussed within the industry as possible, but has not yet been substantiated and will differ based on the individual distribution systems.²⁶³ Other recent relevant research suggests that at blending levels above 5% by volume, there is a greater chance of pipeline leaks and embrittlement, and that such a level of blending could require modifications of end-use appliances.^{264, 265}

²⁵⁹ AGREE, *Comments on the Revised LTP*, 2-3.

²⁶⁰ NYSEG and RG&E, *Final LTP*, 69 and 98.

²⁶¹ Note that Methane's volumetric density is about 3.2 times greater than that of Hydrogen; Bossel, Ulf, and Eliasson, Baldur, "Energy and the Hydrogen Economy," 5. Available from https://afdc.energy.gov/files/pdfs/hyd_economy_bossel_eliasson.pdf; accessed November 4, 2023.

²⁶² NYSEG and RG&E, Response to LTGP-23-082.

²⁶³ NYSEG and RG&E, *Final LTP*, 99.

²⁶⁴ Southern California Gas Co. performed a study that successfully blended up to 20% hydrogen through a closed loop natural gas system, which included testing end-use appliances. See <https://newsroom.socalgas.com/press-release/socalgas-among-first-in-the-nation-to-test-hydrogen-blending-in-real-world>; accessed November 4, 2023.

²⁶⁵ Penchev, Miroslav, et al., *Hydrogen Blending Impacts Study Final Report*, 2022.

Each distribution system is different and is likely to require modifications at distinct levels of blending. A recent Energy Law Journal article concludes that “Infrastructure tolerances vary, and due to the case-by-case studies required, there is no definitive rule for [hydrogen] blend tolerances.”²⁶⁶

3.7.4. Recommendations

While the Companies assume blending up to 20% by volume, no evidence yet suggests the specific NYSEG and RG&E natural gas systems can safely deliver this hydrogen/natural gas blend.

The Companies state that they are “studying the blending of green hydrogen with natural gas in distribution facilities,” but it appears that this activity is monitoring other studies, rather than pilot projects in their service territories’.²⁶⁷ While it is certainly important to stay up-to-date with the latest hydrogen research, CRA recommends NYSEG and RG&E consider a study or pilot program of their own to assess appropriate safe hydrogen blending limits and to gain experience in the operational approaches required for blending, assuming this pilot program can be completed at a reasonable cost to customers.

Such a study would include further research to study the impact on safety of blending hydrogen on the Companies’ mains, services, valves, fittings, etc. and the potential impact on leakage rates and end-use appliances. As pointed out by NYSERDA in their comments, it is unclear whether the Companies have included storage costs, which may be substantial. These additional costs should also be explored in their research. Another key output of this study would be a more accurate estimate of costs associated with upgrading existing natural gas system distribution infrastructure and/or end-use appliances within the Companies’ service territories. These costs would

²⁶⁶ Hook, Marcia, et al., *Hydrogen’s Potential Role in LDC’s Transition to a Low-Carbon Future*. Energy Law Journal. 44.1:1, May 2023.

²⁶⁷ NYSEG and RG&E, Response to LTGP-23-0083.

ultimately have to be reflected in the BCA when developing a LTP and could serve to make system-wide hydrogen blending a less attractive option.

Additionally, in the LTP, it is stated that NYSEG and RG&E will “Engage with industrial gas customers regarding current and future energy profiles, priorities related to energy use, importance of gas to their business, the interest in and potential for energy efficiency of process load, electrification of space heating, carbon capture, industrial heat pumps, and other clean energy solutions.”²⁶⁸ This is an encouraging step, as targeted direct use of hydrogen could end up being the best use case for an LDC. CRA recommends that the Companies focus their efforts on hydrogen use by working with the industrial sector to understand the best direct applications that do not require system-wide blending. It is important that the Companies pursue these conversations. CRA recommends NYSEG and RG&E further provide their perspective on the key issues associated with using hydrogen as a decarbonization tool and how they plan to discuss/frame those issues with their industrial customers. Additionally, updates and progress related to these conversations should be provided publicly on a periodic basis either through the Companies’ website and/or the Annual Updates to the LTP.

When asked to disclose the studies that the Companies used to develop their hydrogen blending assumptions, they were unable to do so.²⁶⁹ CRA recommends that NYSEG/RG&E provide further information about the studies’ findings that validate the blend levels used in the LTP, especially as they are contrary to other publicly available studies previously cited.

3.8. Energy Efficiency/Demand-Side Management and Demand Response

3.8.1. Background

New York has a 2025 statewide EE target of 185 trillion BTU of cumulative annual site energy savings relative to forecasted energy consumption in 2025, supported by a comprehensive set of initiatives. This is described in NYSERDA’s 2018 New

²⁶⁸ NYSEG and RG&E, *Final LTP*, 120.

²⁶⁹ NYSEG and RG&E, Data Request Response LTGP-23-165.

Efficiency: New York report.²⁷⁰ Initiatives include several programs administered by NYSERDA funded through the \$2 billion Clean Energy Fund (“CEF”) that are targeted to address barriers to the adoption of EE technologies and support solutions for LMI customers. Targeted strategies include assisting with affordability, strengthening statute on building codes and appliance standards, driving deep energy savings in building retrofits and construction, and supporting heat pump adoption.²⁷¹ These programs are intended to integrate with investor-owned utility programs that will be developed as part of utility Energy Efficiency Transition Implementation Plans. The December 2018 NY PSC Order, “In the Matter of a Comprehensive Energy Efficiency Initiative,” required utilities to file System Energy Efficiency Plans. A subsequent Order, issued in January 2020, authorized the Companies’ EE and electrification portfolio from 2020 – 2025.²⁷²

In November 2023, in compliance with the July 2023 NENY proceeding Order, the Companies filed their energy efficiency and building electrification program proposal in Case 18-M-0084.²⁷³ The proposal (“EE/BE Portfolio Proposal”), updated in January 2024, describes the details of their proposed program plan for the years 2026-2030. As stated in the Revised LTP, “Proposed changes to the Companies’ energy efficiency programs are described in Chapter II [of the LTP] and underlying assumptions from the Companies’ weatherization program are used in the LTP modeling.”²⁷⁴ Ultimately, the Commission will approve, reject, or approve with modification the Companies’ EE/BE Portfolio Proposals after seeking input from stakeholders in Case 18-M-0084.

When describing scenarios that LDCs provide in their LTPs, the Gas Planning Order requires the LDCs to “show how other scenarios would meet the forecasted need, in

²⁷⁰ NYSERDA, *New Efficiency: New York*. Available from: <https://www.nyserda.ny.gov/About/Publications/New-Efficiency>.

²⁷¹ *Id.*, 3.

²⁷² See NY PSC Case 18-M-0084.

²⁷³ Case Number 18-M-0084, Proceeding on Motion of the Commission to Consider a Clean Energy Fund in the Matter of a Comprehensive Energy Efficiency Initiative, Order Directing Energy Efficiency and Building Electrification Proposals, Issued and Effective July 20, 2023.

²⁷⁴ NYSEG and RG&E, *Revised LTP*, 107

the entirety or in part, through demand response, electrification, and energy efficiency programs.”²⁷⁵

Further, the Gas Planning Order directs LDCs to provide estimates of reduction in peak demand resulting from demand-side investments. It specifically states that “qualitative discussion is not sufficient for stakeholders who are attempting to develop options to traditional infrastructure” and requires LDCs “explicitly state the level of demand management and energy efficiency programs included in their respective demand forecasts.”²⁷⁶

With regard to scenarios of how to meet reliability needs, including the retirement of LPP, the Gas Planning Order allows the LDC to propose traditional capital projects, but requires the LDC to include a “no infrastructure option.” Demand management is intended to be an integral part of the planning process.²⁷⁷

3.8.2. Stakeholder & Company Feedback

Multiple Intervenors point out that the Companies’ LTP does not adequately consider demand response as a resource as they only present a limited residential program. Multiple Intervenors recommend that the Companies investigate the cost effectiveness of developing demand response programs for industrial customers, as industrial customers’ high demand may allow for a significant reshaping of the daily demand curve.²⁷⁸ SC/EJ say the LTP should be revised to include energy efficiency, demand response programs, and other load reducing alternatives such as electrification of boiler-based systems.²⁷⁹

In their comments on the Revised LTP, NYSERDA asserts that the Companies “should include a sensitivity of cost declines for electrification and energy efficiency

²⁷⁵ NY PSC, *Gas Planning Order*, 12.

²⁷⁶ *Id.*, 28-30.

²⁷⁷ *Id.*, 11 & 35 – 37.

²⁷⁸ Multiple Intervenors, *Comments on the Initial LTP*, 16.

²⁷⁹ Sierra Club and Earthjustice, *Comments on the Initial LTP*, 42.

technologies over the term of the LTP.” They specifically note that ccASHP and GSHP systems should have cost decline sensitivities. “NYSERDA acknowledges and appreciates that the CRA Scenarios presented in the Revised LTP assume a 1% annual nominal reduction in heat pump cost. However, while informative, this is insufficient to understand the impact of these cost changes to the core plan that the Companies propose to pursue. Because the CRA Scenarios are different from the LTP scenario in many other ways, stakeholders cannot properly evaluate the isolated impact of modifying the cost trajectory of these decarbonization measures.”²⁸⁰

3.8.3. Findings

Energy Efficiency/Demand-Side Management

The Companies’ approach to developing estimates of the potential for EE measures to reduce gas consumption focuses primarily on weatherization for the residential and commercial/municipal market segments. The residential weatherization model in the Initial LTP was based on the same general assumptions regarding cost and savings as those used by NFG in its LTP, adjusted for the NYSEG and RG&E heating loads and weather data.²⁸¹

For the Revised and Final LTPs, the residential weatherization plan was updated per CRA’s recommendation and is now based on the Companies’ EE/BE Portfolio Proposal.²⁸² The Companies’ have determined that approximately 51% of residences in their service territory require insulation. Participation rates for the residential weatherization program in the LTP and both of the Companies’ CLCPA scenarios are calculated based on that determination, such that 51% of existing homes are weatherized by the end of the forecast period.²⁸³ This results in an assumption that 1% of residential customers weatherize their homes starting in 2027, increasing by

²⁸⁰ NYSERDA, *Comments on the Revised LTP*, 16.

²⁸¹ NYSEG/RG&E, *Initial LTP Appendix A*, A-6.

²⁸² NYSEG and RG&E, *Revised LTP*, 83; NYSEG and RG&E, *Final LTP*, 94.

²⁸³ NYSEG and RG&E, *Final LTP Appendix A*, A-5 – A-6.

0.25% per year. The Delayed Achievement scenarios assume 0.5% of homes are weatherized starting in 2027, increasing by 0.125% per year.

These changes in the weatherization plan (using the Companies' EE/BE Portfolio Proposal rather than NFG's LTP assumptions) have significantly improved the assumed cost-effectiveness of residential weatherization in the Companies' LTP. Table D-3 of the Initial LTP Appendix D calculated \$312/ metric ton ("MT") carbon dioxide equivalent ("CO₂e") (i.e., the cost to reduce emissions by one metric ton of CO₂e) for standard income customers and \$780/MT CO₂e for LMI customers. The equivalent table for the Revised LTP, Table D-5, combines the residential classes into one and shows a substantially more cost-effective \$52/MT CO₂e for residential weatherization measures. CRA investigated the variances from the Initial LTP to the Revised LTP further through an additional data request; please see LTGP-23-195 in the Appendix.

In the Final LTP, the cost-effectiveness of residential weatherization has even further increased (full table can be found in Section 1.7). The cost per MT CO₂e is now \$33.

Commercial and municipal weatherization program assumptions are based on high-level assumptions regarding cost per unit of natural gas reduction as referenced in National Grid's New York Total Buildings Comfort Program.²⁸⁴ The LTP notes that this is also the basis for some of the assumptions used in NFG's LTP. The Companies assume that a weatherization program targeted to commercial and municipal customers will result in savings of 0.5% load reduction/year and 1% load reduction/year, respectively, for both of the Companies' CLCPA scenarios and the LTP scenario.

The LTP's discussion of the industrial market segment focuses on the development of a program targeted to industrial process efficiency improvements. The assumptions used are high-level based on natural gas usage in the industrial sector, and the percentage of each operating company's industrial load that is associated process

²⁸⁴ NYSEG and RG&E, *Final LTP Appendix A*, A-9.

usage. The industrial EE annual costs and assumed savings are taken from the NFG LTP.²⁸⁵ The assumed energy savings for industrial process load is 0.5% per year in incremental energy savings for both the CLCPA and LTP scenarios.²⁸⁶

Regarding natural gas demand-side management, the Companies state that existing gas efficiency rebate programs have had a measurable impact on customer usage, which has historically been used as the basis to decrease annual forecast demand for EE. The LTP notes that the residential EE adjustments will end after 2025 and the commercial EE adjustments were reduced after 2025 to be consistent with the Commission's recent Order Directing Energy Efficiency and Building Electrification Proposals, which eliminates residential rebates for gas equipment and non-residential rebates for efficient gas equipment starting in 2025.²⁸⁷

In their Final LTP, the Companies identify three new non-residential programs they plan to launch in 2024. The first, the "Commercial Instant Discount Program," will offer incentives to manufacturers and distributors to narrow the price difference between traditional and high-efficiency equipment. The "Retro-Commissioning Program" will offer low- and no-cost facility improvement measures to save energy and manage load. Lastly, the "Energy Management Partnership" is meant to collaborate with the Strategic Energy Management Program from NYSERDA, which aims to give customers the tools to manage energy within their organization.²⁸⁸

The Companies also further discuss two new, and one existing, residential energy efficiency programs. The existing program, the "Retail Products Program", helps reduce the costs of small-scale and DIY energy efficiency measures for residential customers. The proposed "Home Insulation and Air Sealing Program" is scheduled to begin fully in 2026, with a pilot program beginning in 2024. This program is meant to incentivize insulation and air-sealing for market rate residential single-family

²⁸⁵ NFG, *Final LTP*, Appendix A, Table A-28.

²⁸⁶ NYSEG and RG&E, *Final LTP Appendix A*, A-33.

²⁸⁷ NY PSC, *Order Directing Energy Efficiency and Building Electrification Proposals*, January 16, 2020.

²⁸⁸ NYSEG and RG&E, *Final LTP*, 21 – 22.

homeowners. Lastly, the Companies plan to implement the “Market Rate Residential New Construction” in 2026. This proposed program would focus on proactive education for builders of planned and newly constructed homes to ensure best practices for energy efficiency.²⁸⁹

Demand Response

The LTP discusses demand response in the context of the Companies’ current programs, where they indicate that they have started to explore a residential demand response pilot in the form of a “Bring Your Own Thermostat” (“BYOT”) program. It is expected to begin in late 2024/early 2025. This program is currently in the development stage and is coupled with investigation into other New York utility programs.²⁹⁰

The Companies provide interruptible (non-firm) gas service to customers that meet the eligibility criteria under their respective tariffs.²⁹¹ Customers can take gas service on a fully interruptible basis, as they maintain sufficient facilities and alternative fuels to operate continuously during the interruption period. The Companies use communication protocols to verify that interruptible customers have the ability to switch off gas as required to maintain reliability of service to firm customers.

Interruptible gas service is an effective demand response measure deployed by the Companies’ that has reduced gas demand at peak times and lessened constraints on the distribution system in exchange for a lower delivery rate compared to the otherwise applicable firm service rate. These customers’ demand is not included in the Companies’ Design Day gas demand requirements, allowing the Companies to avoid the costs of associated pipeline and storage capacity and distribution capacity to serve these interruptible customers.

²⁸⁹ NYSEG and RG&E, *Final LTP*, 22 – 23.

²⁹⁰ *Id.*

²⁹¹ NYSEG PSC No.87 Leaf 22-27.2 and PSC 88 Gas Leaf 58-61.3 and RG&E PSC No. 16 Leaf 152-156 and Leaf No. 157-162 Gas Tariffs for Interruptible Gas Sales and Transportation Services

Under its current rate agreements, the Companies have no incentive to convert a customer from firm to interruptible due to the loss of revenue.

3.8.4. Recommendations

Energy Efficiency/Demand-Side Management

The Companies' LTP models weatherization at "the greatest levels the Companies believe can be achieved."²⁹²

CRA submitted data requests LTGP-23-074 through LTGP-23-076 to better understand the basis for the ramp rate assumptions used for the Initial LTP. The Companies responded with LTGP-23-074, 075 and 076, wherein they said:

The Companies are not aware of any relevant studies that demonstrate the likely adoption rate of electrification therefore the Companies applied a standard, simple ramp rate curve in its modeling. The ramp rates are not sector or appliance specific; rather, they are generalized curves that assume an initial saturation rate before progressing on an incremental basis to the maximum adoption percentage for the last five years of the study. Given the absence of data to support customer specific and technology-specific ramp rates, the expected gradual growth in participation over time as the market for conversions improves, and the similarity between replacement decisions for different types of appliances required by customers regarding acceptance of renovations within their home or business, it is reasonable to use the same ramp rate for all sectors and appliance types.

Therefore, CRA understands that the adoption rates used in the modeling of EE measures are illustrative of what would be required to achieve the pre-determined level of adoption and are not forecasts that are linked to studies and/or market experience. See the recommendations on electrification in Section 3.10.4 for further discussion of adoption rates.

In CRA's Initial Findings Report, CRA recommended that in future revisions of the LTP, the Companies provide more specific discussion regarding how these adoption rates might be achieved, and how this relates to their EE/BE Portfolio Proposal and other

²⁹² NYSEG and RG&E, *Final LTP*, 94.

programs that might support the adoption of these technologies and measures. In their Reply Comments, the Companies indicated that they will be including more details on how they plan to align their weatherization assumptions with their Energy Efficiency Proposal for 2026-2030 in their Revised LTP.²⁹³ As stated in the previous section, the Companies' Revised LTP indeed does utilize cost and savings assumptions from their EE/BE Portfolio Proposal, per CRA's recommendation.

The Companies have done a better job of aligning their EE forecast to their actual plan over the next three years in the Final LTP. The adoption rate increases over time to align with the Companies' projected weatherization needs. Consistent with Section 3.10.4, CRA recommended aligning the weatherization plan to the Companies' electrification plan, as customers should weatherize prior to electrification. This change has been implemented in the CRA/Stakeholder scenarios but has not been included in the Companies LTP or scenarios. In any case, the Companies should work to accelerate the rate of weatherization due to its cost-effectiveness relative to other decarbonization measures.

In its Initial Findings Report, CRA recommended that various other proceedings that impact EE (18-M-0084, the JP, the NENY process, etc.) be described in more detail in future revisions of the LTP. The Companies included a preliminary discussion of these proceedings in Chapter VII of their Revised and Final LTPs. However, CRA recommends expanding upon this information within the LTP itself using information provided in the EE proposal. Specifically, the Companies should provide a more thorough discussion of the implementation plan of their EE program, including plans for community outreach and education.

In the "Conclusions and Implementation Actions" discussion, the Companies discuss designing programs that will achieve the forecasted levels of adoption, and doing work to get a better understanding of customer adoption issues. They also discuss the need

²⁹³ NYSEG and RG&E, *Reply Comments on Initial LTP*, 26.

to get regulatory approval for the cost of the programs that would be required. Updates on these steps should be included in the annual LTP updates.

Demand Response

CRA recommends that the Companies develop a demand management program that specifically targets NPA opportunities and areas of the network that are candidates for strategic downsizing. In the LTP, the Companies have indicated that they are collaborating with other New York gas utilities to gain insights and lessons learned from their gas demand response programs.²⁹⁴ CRA recommends that the Companies report the status of their evaluations of programs by other New York utilities in their LTP and subsequent Annual Updates, incorporating stakeholder recommendations and discussing planned next steps.

CRA suggests the Companies review the National Grid firm gas demand response portfolio to determine its applicability to the Companies' customers and service areas. It is designed to achieve peak day and peak hour demand reductions on its gas distribution system from all customer segments (residential, multi-family, institutional and industrial customers). National Grid has a BYOT program for residential customers similar to the pilot program that NYSEG/RG&E plan to implement.²⁹⁵ These programs would require new rate designs that provide incentives for customers to shift or reduce gas usage and would benefit from automated metering.

The National Grid downstate utilities (The Brooklyn Union Gas Company and KeySpan Gas East Corporation) currently have four firm gas demand response program offerings that have been operating for several years. These firm demand response programs focus on preserving system reliability and reducing infrastructure costs by customers temporarily ceasing their consumption of natural gas in whole or part (i.e. shedding load) or shifting some of their usage to non-peak hours (i.e. shifting load). These programs can provide insights on customer performance, achieved peak day

²⁹⁴ NYSEG and RG&E, *Final LTP*, 23.

²⁹⁵ National Grid New York, *Testimony of the Customer Panel, Firm Gas Demand Response Portfolio*. 121-123. Cases 23-G-0225 and 23-G-0226. June 30, 2023.

and peak-hour demand reductions, and can provide valuable lessons learned for the Companies firm demand reduction program development.²⁹⁶ The Companies discuss reaching out to other utilities to learn from their programs in the LTP.

CRA recommends that the Companies continue to explore firm customer demand response programs by developing new tariff offerings and programs that would provide appropriate incentives for customers to participate, including new rate designs and payment structures that incentivizes sustained consumer engagement, while undertaking consumer outreach and education.²⁹⁷

These programs could achieve targeted peak load (peak-hour and peak day) shifting and/or reduction, reducing load on the Companies' distribution system that would result in quantifiable benefits by avoiding infrastructure investment. Additionally, customers could benefit from supply cost savings through these programs as the Companies could avoid utilizing market-priced commodity delivered/peaking gas services and/or CNG.

This would also serve to further the deployment of NPAs and allow the Companies to achieve financial incentives as prescribed in the BCA Framework Order or by potentially sharing benefits through the achievement of performance metrics.

This could be accomplished via pilot programs that allow the Companies to better understand the potential for cost-effective demand reduction for inclusion in future LTPs and rate cases.

In their LTP, the Companies should consider modeling a reduction in peak demand as a result of these demand response programs.

Coupled with this, the Companies should explore the use of advanced metering infrastructure ("AMI"), that would provide more information on customer usage,

²⁹⁶ *Id.*

²⁹⁷ Currently, the Companies existing demand response programs are for interruptible customers.

including time-of-day and seasonal-use data that could inform rate design and program implementation.

The Companies discuss providing updates on their progress with the residential pilot and lessons learned in future LTP filings and annual updates.

3.9. Electrification

3.9.1. Background

The Gas Planning Order proposes that the electrification of gas heating and appliances (using air-source heat pumps ["ASHP"] and/or ground-source heat pumps ["GSHP"]) be included as part of the demand forecast to assess the potential impact on overall gas demand in the future. Electrification is also expected to be a key component of NPAs to assist with addressing supply constrained areas of the gas network. The Gas Planning Order identifies whether and how gas-only LDCs can or should be incentivized to encourage electrification measures as an issue. However, it does not direct how this should be addressed, and therefore, this issue is not discussed in the Companies' analysis. As a result, policy options and incentives to convert to electric heat pumps and appliances are not included as benefits in the Companies' Revised LTP analysis.

While agency or legislative action would be needed to implement the recommendations provided in the New York State CAC Final Scoping Plan, objectives are stated in the Final Scoping Plan.²⁹⁸ For example, the CAC states an objective that by 2030, heat pumps will comprise the majority of new purchases for space and water heating, with the expectation that one to two million homes and 10-20% of the commercial space heating market will be using heat pumps by 2030.²⁹⁹

Further, the CAC outlines a vision for 85% of homes and commercial building space statewide being electrified by 2050.³⁰⁰ The CAC identified several mechanisms that

²⁹⁸ CAC, *Climate Action Council Scoping Plan*, 51.

²⁹⁹ *Id.*, 11.

³⁰⁰ *Ibid.*

would drive this rapid adoption of electrification including zero emissions building codes, scaled-up finance mechanisms, workforce development, and other programs. While New York's electric utilities currently provide rebates and finance programs for heat pumps, these other mechanisms have not been developed or implemented at the current time, and no gas utilities are offering wide-scale programs to encourage electrification. As a result, the adoption of heat pump options for space heating requires analysis of economics, estimation of adoption rates using various modeling approaches, and the use of scenarios to reflect potential future states of adoption.

In addition to ASHPs, the LTP is expected to include consideration of Utility Thermal Energy Networks ("UTENs" or ground-source heat pump loops) for both new construction in areas of multi-home developments and as an option for strategic retirement of the gas network in areas with extensive LPP requiring replacement. This is also discussed in the CAC Final Scoping Plan. In order to start to address this, gas utilities can obtain approval for pilot projects, as provided in Case No. 22-M-0429.³⁰¹

[LDCs] shall submit, by October 5, 2022, compliance filings regarding pilot utility thermal energy network project proposals and, by January 9, 2023, proposed pilot utility thermal energy network projects for Commission review, as discussed in the body of this Order.

It is expected that these pilots will provide a basis for giving this technology future consideration in planning. NYSEG has filed proposed project plans for two pilots and RG&E has filed proposed project plans for one pilot project.³⁰²

The NENY program provides additional support for electrification by encouraging accelerated heat pump adoption in both the residential and commercial market segments. NENY will encourage the development of electrification programs by funding subsidies, training, and qualifying contractors for heat pump installations, and supporting other initiatives.

³⁰¹ NY PSC, *Order on Developing Thermal Energy Networks Pursuant to the Utility Thermal Energy Network and Jobs Act*, Case 20-M-0429, September 15, 2022, 18.

³⁰² NYSEG and RG&E, *New York State Electric & Gas Corporation's and Rochester Gas and Electric Corporation's Proposals for Thermal Energy Network Pilots*, Case 22-M-0429, October 7, 2022, 5.

The July 2023 NY PSC Order Directing Energy Efficiency and Building Electrification Proposals and the resulting System Energy Efficiency Plan (“SEEP”) that has been issued by the Companies on November 1, 2023, will provide additional support for the deployment of heat pumps.³⁰³

3.9.2. Stakeholder & Company Feedback

Stakeholders, including AGREE and the SC in their comments, questioned why the Companies model residential customers selecting conventional heat pump technology that is paired with a gas furnace to hybrid heating system when ccASHPs are available.

AGREE believes the Companies’ LTP fails to consider electrification as a viable alternative and instead relies on serving gas demand through hydrogen blending. AGREE cites a growing trend among industry experts to encourage electrification over the use of hydrogen for appliances.³⁰⁴ AGREE further states the Massachusetts DPU issued an order on December 6, 2023, which rejected “hydrogen pilots using rate-payer money.”³⁰⁵

AGREE also questions the Companies’ adoption rates for heat pumps as “the Companies’ assumed customer adoption rates are significantly lower than the Climate Action Council’s estimates.”³⁰⁶ AGREE notes that this deviation needs to be corrected or explained.³⁰⁷

³⁰³ NY PSC, *Order Directing Energy Efficiency and Building Electrification Proposals*, Case 18-M-0084, July 20, 2023.

³⁰⁴ AGREE, *Comments on the Initial LTP*, 5.

³⁰⁵ *Ibid.*

³⁰⁶ *Id.*, 4.

³⁰⁷ *Ibid.*

Ratepayer and Community Intervenors point out that the Companies' models cite outdated heat pump technology and falsely assume a hybrid system is less expensive than a single system.³⁰⁸

SC/EJ cite the same Massachusetts DPU order, which states "long term use of the natural gas distribution system generally will be limited to strategic circumstances where electrification is not feasible for all natural gas appliances."³⁰⁹ SC/EJ say this order "validates and supports many of the concerns regarding the Companies' initial LTP filing."³¹⁰

SC points out that "Indeed, the Massachusetts DPU recently rejected utility proposals to pursue hybrid heating systems, finding them unnecessary and imprudent. The DPU explained that, "[g]iven improvements in technology, the Department expects that cold-climate heat pumps generally will eliminate the need for backup heating systems," and in the long term, "it will be impractical to maintain the gas distribution system solely for backup furnaces in cold weather." The DPU explained that it would "therefore not approve the use of additional ratepayer dollars for hybrid heating system pilots" and clarified its expectation for "LDCs to focus on targeted electrification and—pending the outcome of current pilots—networked geothermal projects to meet the long-term climate targets of the Commonwealth."³¹¹

SC/EJ point out that the CLCPA Full Electrification scenario is less dependent on RNG, but notes that the assumptions in the scenario, such as the use of cold-climate heat pumps, vary from the LTP.³¹² SC/EJ further state that delaying electrification by relying on RNG will be more expensive as the Companies will need to continue to invest in the distribution system, whereas a direct-electrification plan would allow customers to avoid paying into a system that will need to be retired to meet future

³⁰⁸ Ratepayer and Community Intervenors, *Comments on the Initial LTP*.

³⁰⁹ Mass DPU, *Order on Regulatory Principles and Framework*, Mass. DPU 20-80-B. December 6, 2023, 70.

³¹⁰ Sierra Club and Earthjustice, *Comments on the Initial LTP*, 2.

³¹¹ SC/EJ, *Comments on the Initial LTP*, 15.

³¹² *Id.*, 14.

compliance requirements.³¹³ SC/EJ state that RNG and hybrid heating systems are unnecessary interim steps to electrifying targeted neighborhoods.

Overall, SC/EJ believe the Companies' electrification scenarios contain unreasonable assumptions, including adoption rates and the assumption that customers with boilers would not switch to electric heat.³¹⁴ The Companies overstate the cost of a cold-climate air-source heat pump by 300% and fail to factor rebates and tax credits into their CBAs.³¹⁵ Their LTP also fails to consider using thermal energy networks within their service territories as a means to reduce demand.³¹⁶

Strategen states "the Companies' LTP Pathway is unlikely to ever reach an 85% reduction from 1990 emissions, without significant changes to its electrification conversion approach."³¹⁷ Strategen believes the Companies should consider electrifying boilers and should reevaluate their assumption that cold climate heat pumps are \$12,000 more than a standard heat pump.³¹⁸

The Companies respond to Stakeholder comments regarding electrification across six specific issues: "(1) the need for supplemental heat; (2) heat pump installed cost assumptions; (3) the modeling of tax credits and rebates, (4) incremental costs of New York Legislation; (5) improvements in heat pump efficiency and cost; and (6) the treatment of hard-to-electrify buildings."³¹⁹ Each of these topics is discussed further in the following paragraphs.

Regarding segmentation of building types, the Companies note that each building has different characteristics impacting electrification, but state that it is appropriate to rely

³¹³ *Id.*, 15.

³¹⁴ *Id.*, 19.

³¹⁵ *Id.*, 23.

³¹⁶ *Id.*, 53.

³¹⁷ Strategen, *Comments on the Initial LTP*, 7.

³¹⁸ *Id.*, 10.

³¹⁹ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 27.

on averages for the LTP. They say the data is not reliable enough to properly differentiate the impacts of electrification on different building types, and that they use the most detailed installation cost and energy impact data available.

The Companies responded to CRA questions about market adoption rates. They agree that the issues raised on market adoption rates are reasonable if the data were available, but the information available is not sufficient. The Companies state that “absent timely studies by reputable sources that provide a meaningful quantification of customer selection and adoption behavior, the Companies’ approach to modeling customer adoption rates is reasonable and can be updated in future LTPs as such studies that are sufficiently applicable to the NYSEG and RG&E service areas are produced.”³²⁰

The Companies also reply to RCI comments on supplemental heat associated with heat pumps. RCI brings up that heat pumps are available that can be rated down to temperatures experienced in the Companies’ service territories. The Companies disagree with this based on the assumption that RCI is referring to standard ASHPs. They further state that standard ASHPs cannot perform at temperatures experienced in their service territories, making supplemental heat necessary to keep homes warm.

Regarding heat pump costs, the Companies address Strategen and RCI’s comments that their modeled costs of \$11,000 and \$17,500 for hybrid heating and ccASHPs are too high. They state that the assumptions for hybrid systems are very similar, and the recommended lower ccASHP cost estimate (\$15,378) is based on a different region and should be disregarded. They assert that costs are higher for ccASHPs in upstate New York. The Companies add that their Clean Heat Program data shows that 2020-2023 ccASHP installations are more than \$17,500.

The Companies respond to comments on tax credits and rebates from SC/EJ, which state that the Companies should include rebates and tax credits in their LTP modeling. The Companies disagree with this on the basis that funding for state and federal tax

³²⁰ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 28.

credits and rebates ultimately come from ratepayers, and “the goal of the LTP modeling is to identify all of the incremental costs associated with the Scenarios and the LTP.”³²¹ The Companies also address incremental costs specifically associated with New York State legislation. Strategen raises the point that the Companies should not include the incremental costs to electrify because new customers starting in 2026 are required to have electric appliances and equipment. The Companies disagree with this on the basis of all costs ultimately coming from ratepayers/taxpayers.

Strategen has criticized the Companies’ Initial LTP for not projecting cost reductions or efficiency gains for heat pump technology over the span of the LTP. Strategen cites a 2022 European report and a 2018 NREL Electrification Futures study. The Companies opine that the European report is for a different market and the NREL study is not recent enough to be considered in the LTP modeling. The Companies instead state that they rely on the 2023 EIA assumptions that heat pump efficiency and cost remain relatively constant throughout the LTP period. Regarding heat pumps, the Companies clarify that customers with boilers will still be allowed to electrify under the LTP. However, these customers’ conversions are modeled after easier-to-convert customers with gas furnaces have switched to electric heat.

NYSERDA, in their comments on the Revised LTP, note that the Companies state that weatherization and electrification are independent. NYSERDA recommends that the Companies assume customers weatherize before electrifying.³²²

In their comments on the Revised LTP, NY GEO provides further recommendations on geothermal heat pump adoption. They begin by recommending “identifying all current electric customers using oil and propane for heating purposes. These customers would be ‘low hanging fruit’ for a geothermal heat pump system.” They add that the

³²¹ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 31.

³²² NYSERDA, *Comments on the Revised LTP*, 17-18.

Companies should work from “rural to urban,” from the end of the gas grid towards the center. This approach would help with strategic downsizing as well.³²³

3.9.3. Findings

The Companies’ LTP includes four scenarios providing varying levels of electrification in addition to the LTP scenario. These scenarios include the following:

1. The CLCPA Full Electrification scenario uses cold climate air source heat pumps (“ccASHPs”) to replace gas furnaces and boilers for both the residential and commercial market segments to achieve a 65% GHG reduction by 2043. Buildings are assumed to use resistance electric heating as backup to the ccASHPs on cold days.
2. The Delayed Achievement Full Electrification scenario uses ccASHPs to replace gas furnaces and boilers similar to the full electrification case to achieve a 50% GHG reduction by 2043.
3. The CLCPA Hybrid Heating scenario uses standard ASHPs to electrify the furnace heating load for the residential market segment but retains the gas furnaces for backup on cold days to achieve a 65% GHG reduction by 2043. The commercial and municipal market segments install ccASHPs. Buildings with gas fired boilers are not electrified.
4. The Delayed Hybrid Heating scenario uses ASHPs to electrify the furnace heating load for the residential market segment but retains the gas furnaces for backup on cold days to achieve a 50% GHG reduction by 2043. The commercial and municipal market segments install ccASHPs. Buildings with gas fired boilers are not electrified.
5. The LTP assumes that all customer segments with furnaces convert to heat pump systems at the end-of-life of their heating or central air conditioning

³²³ NY GEO, *Comments on the Revised LTP*, 3.

systems at a pace that ramps up to a maximum market share in 2039. This maximum varies by segment as follows:

- a. A maximum of 75% of residential customers with furnaces convert to ASHPs and retain their gas systems for backup,
- b. A maximum of 30% of commercial customers with furnaces convert to hybrid standard ASHPs,
- c. A maximum of 50% of municipal customers with furnaces convert to ccASHPs and do not retain their gas systems for backup,
- d. A maximum of 30% of industrial furnaces are converted to ccASHPs and do not retain their gas systems for backup.

Using data obtained from LTGP-23-217, CRA developed the following tables to summarize the number of customers electrifying by class for both NYSEG and RG&E.

Table 3-5. NYSEG Electrified Customers and Percentage of Customers Converted by Scenario

	NYSEG CLCPA Full		NYSEG CLCPA Hybrid		NYSEG Delayed Full		NYSEG Delayed Hybrid		NYSEG LTP	
	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted
Residential	88,052	36.10%	88,052	36.10%	56,821	23.30%	90,922	37.28%	66,106	27.10%
Commercial	5,310	20.19%	5,310	20.19%	4,441	16.88%	-	-	-	-
Industrial	30	27.13%	30	27.13%	25	22.62%	32	29.08%	19	17.47%
Municipal	903	31.33%	903	31.33%	732	25.39%	-	-	-	-
Total	94,295	34.51%	94,295	34.51%	62,019	22.70%	90,954	33.29%	66,125	24.20%

Table 3-6. RG&E Electrified Customers and Percentage of Customers Converted by Scenario

	RG&E CLCPA Full		RG&E CLCPA Hybrid		RG&E Delayed Full		RG&E Delayed Hybrid		RG&E LTP	
	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted	Number of electrified Customers	Percentage of Customers Converted
Residential	144,401	47.60%	170,339	56.15%	107,726	35.51%	133,812	44.11%	82,206	27.10%
Commercial	5,508	26.00%	-	-	3,536	16.69%	-	-	-	-
Industrial	33	20.22%	93	57.30%	21	12.65%	38	23.16%	16	9.77%
Municipal	431	31.60%	-	-	543	39.75%	-	-	-	-
Total	150,373	46.11%	170,432	52.27%	111,825	34.29%	133,850	41.05%	82,222	25.21%

The Companies suggest in the LTP that residential customers will opt for hybrid heating systems for cost, comfort, and reliability issues. For commercial customers, the Companies indicate that the conversion rate is lower because of competitive pressures for this customer segment, which is similar to the industrial market segment. Higher conversion rates are possible for municipal buildings, where a policy might mandate that the government leads by example. For this reason, the Companies modeled a higher maximum adoption rate of 50%.³²⁴

Significant detail is provided regarding the market segmentation, housing stock assumptions, appliances, conversion costs and other details used to develop the assumptions for the model in Appendix A. The residential housing stock is segmented into houses that are designated as typical (less than 80 years old) and older homes (80+ years old), as well as homes that are heated with a furnace or a boiler. The data used comes from several studies performed previously for the Companies or for other utilities (NFG and National Grid). The cost assumptions for conversion to electrification are derived from the NFG LTP but are modified based on data that the Companies have on the housing stock distribution in their service territories. As a result of the

³²⁴ NYSEG and RG&E, *Final LTP*, 96.

variety of studies and references used to develop the assumptions, it is difficult to trace the background and details that support the assumptions.

In response to LTP-23-165 and LTP 23-105, the Companies state that the crossover temperature at which residential hybrid heat pumps would use furnace backups is at 30°F. This temperature is consistent with National Fuel's final LTP Appendix G page 7, which states "The simulations indicated that heat pump capacity could not always meet the heating load below 30°." At temperatures when the furnace is in use, the Companies assume that the furnace will service the customers' entire thermal load, which reduces impact on peak electric load and is consistent with the Companies' understanding of how hybrid heat pumps are typically operated.³²⁵ This assumption in NFG's Final LTP was based on a study done by C.J Brown.

The C.J. Brown study explained the use of this switchover temperature as follows:

*"When the outdoor air temperature is above the changeover setpoint, the heat pump operates to meet the heating and cooling loads; the furnace alone operates below the changeover temperature. System operation was modeled at a range of changeover temperatures. The simulations indicated that heat pump capacity could not always meet the heating load below 30°. In practice, the changeover temperature depends on the match between the installed ASHP heating output and the building heating load. Contractor sizing of the system will have a major impact on the changeover temperature that is possible. Over-sized heat pumps will be able to meet the full heating load down to a lower outdoor air temperature than a properly-sized heat pump. Hybrid heat pump installation costs are based on 15 installations that applied to the Conservation Incentive Program."*³²⁶

Overall, ccASHPs represent an opportunity to improve the performance of more conventional heat pumps, which are already very efficient, and expand their range to colder climates. ASHPs have been installed in homes for decades to provide efficient space heating and cooling, but they have primarily been used in warmer climates. During cold weather conditions, the capacity and efficiency of older, conventional ASHPs were quite poor resulting in heavy reliance on backup heating systems. Cold-

³²⁵ NFG, *Final LTP*, Appendix G, G-7

³²⁶ *Ibid.*

climate heat pumps (CCHPs) provide both space heating and cooling for homes and incorporate advanced features that allow for improved heating capacity and efficiency at cold temperatures as compared with conventional heat pumps. To advance the adoption of ccASHP technologies, the United States Department of Energy's ("DOE's") Cold Climate Heat pump technology challenges heat pump manufacturers to accelerate the development and commercialization of next-generation ccASHPs that meet consumer comfort and efficiency needs in cold climate regions of North America. Please see Section 3.10.4 for further discussion of this program.³²⁷

The geothermal electrification assumptions in the LTP call for one 24-home plus eight non-residential building network geothermal projects being completed every year starting in 2035. The Companies moved the start date of the UTEN programs from 2028 to 2035 in the Final LTP. These assumptions are the same as those used in the CLCPA scenarios. The Delayed Achievement scenarios have the same start date and UTEN size, but only assumes one new project every other year.³²⁸

The adoption of single-building geothermal is not included in any of the Companies' scenarios or in the LTP. These assumptions are very conservative considering evidence from installers that several hundred GSHP systems are being installed each year in New York currently based on input from NY Geo and installers.³²⁹ The Companies have included functionality in the model for GSHPs, but this feature is only used in the CRA/Stakeholder scenarios.

The LTP should include both the geothermal heat pump loops and single building GSHPs in the forecast to be more in line with current market activity.

The Companies have also questioned the reliability and resiliency of full electrification using ASHPs without alternate fuel backup on all days of the year compared to hybrid

³²⁷ U.S. DOE, *Residential Cold Climate Heat Pump Technology Challenge*, <https://www.energy.gov/eere/buildings/residential-cold-climate-heat-pumpchallenge>

³²⁸ NYSEG and RG&E, *Final LTP*, 69 & 100.

³²⁹ NY-GEO, *Geothermal heat pump letter*. NY PSC Case 23-G-0437. Available from <https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=23-G-0437&CaseSearch=Search>. February 4, 2024.

heating systems that include natural gas furnace backup.³³⁰ This implies that customers with gas heating systems also generally have a backup generator to provide electricity to their systems during power outages. Publicly available data on the percentage of homes that have backup generators is limited, but studies that have been done indicate only about 14% of U.S. homes have some type of backup generator.³³¹ This would include portable generators and battery systems, most of which would not be sufficient to support an entire home or to power an electric heating system. The additional cost for this could run from several hundred dollars for a portable generator to more than \$30,000 for a fully interconnected generator to support an entire home. This additional cost, if included, would have a significant impact on the BCA ratio for hybrid heating systems, reducing it significantly, making the hybrid heating system approach less attractive. CRA does not support comparisons that include backup generation to achieve high reliability for heating systems.

The ccASHP first cost was increased from \$17,500 (\$2022) in the Initial LTP to \$23,247 (\$2023) in their Revised LTP, citing actual installation costs from 2020 – 2023 in the Companies' service territory.³³² This was further increased to \$24,247 (\$2023) in the Final LTP.³³³

In response to stakeholder feedback, the Companies ran sensitivities to show the impact of modeling a reduction in heat pump costs of 1% annually. Decreasing heat pump costs by 1% per year reduced *total* LTP costs by 6% and 5.4% for NYSEG and RG&E, respectively.³³⁴ This shows that technology cost reductions can have a substantial impact on the total costs for the LTP. Total installed costs for heat pumps

³³⁰ NYSEG and RG&E, *Final LTP*, 104.

³³¹ Brehm, Johnston, and Milton. *Backup Power: Public Implications of Private Substitutes for Electric Grid Reliability*; Available from https://www2.oberlin.edu/faculty/pbrehm/BrehmJohnstonMilton_Grid_Reliability.pdf. February 13, 2024.

³³² NYSEG and RG&E, *Revised LTP*, Appendix A, A-13.

³³³ NYSEG and RG&E, *Final LTP*, Appendix A, A-15.

³³⁴ NYSEG and RG&E, *Final LTP*, 116.

should be followed closely, and addressed in annual updates due to the significant impact this will have on the LTP.

3.9.4. Recommendations

One important assumption that the Companies made that impacts how stakeholders and the Commission evaluate their LTP was related to the Reference Case customer growth. Table E-1 of the Final LTP's Appendix E shows residential customer count increases of approximately 0.5% for NYSEG and RG&E over the 20-year forecast period. As confirmed in LTGP-23-168, at the time of that data request, the Companies did not adjust their Reference Case (which is used as the basis of comparison for the LTP) to account for New York's budget bill S4006C, passed in 2023 as part of the NYS budget, which prohibits the use of fossil fuel heating systems starting in 2026 for most new buildings (with the requirements expanding to all residential buildings and most commercial buildings in 2029).

This would result in the Companies treating the net installation costs and net operating costs of electrification as incremental costs in their LTP, despite the fact that these new buildings will be prohibited from burning fossil fuel by law, so they will effectively be required to electrify. This decision by the Companies would distort the BCA and any other comparison to the Reference Case, as these customers will be required by law to electrify under any scenario, including the Reference Case.

In their Final LTP at CRA's recommendation, the Companies have adjusted their assumptions in accordance with the NYS budget bill S4006C. They state that "the Reference Case forecast assumes no growth in residential and commercial customer counts starting in 2026 and no growth in municipal and industrial customer counts starting in 2029 due to the passage of legislation in May 2023 regarding the prohibition of fossil fuel in new buildings."³³⁵

³³⁵ NYSEG and RG&E, *Final LTP*, 40.

In the LTP, the Companies discuss a grant program for non-residential customers to convert to a heat pump as an alternative to a natural gas heating system.³³⁶ The Companies should further discuss how this program impacts their decarbonization modeling in their LTP. Additionally, the Companies should track the grant program and discuss its impact on the adoption of heat pumps in their Annual Reports.

Regarding building stock, the building inventory data used to develop the assumptions for the building stock in the NYSEG and RG&E service territories appears to have been derived from several previous studies that provide details of age of construction, heating systems (boilers, furnaces), average building size, appliance types (gas, electric), heating loads and other details needed to estimate annual heating costs, electric and gas usage, and details of the cost of conversion from gas to electric. While the general approach that was used appears to be reasonable, a limited number of building types and sizes were modeled in both the residential and commercial market segments. As a result, the level of precision of the analysis is likely to be limited by the number of prototypical buildings modeled. For example, Table A-21 of the LTP, Age of Homes Built in 1969 or Earlier, as show below in Table 3-7, provides two age categories of homes (built prior to 1939, built between 1940 and 1969), for an average size home.

Table 3-7: Table A-21 from the Companies' LTP Appendices

Age of Homes Built in 1969 or Earlier ⁽¹⁾

Age of Home	% of Homes NYSEG	% of Homes RG&E
Built prior to 1939 ⁽²⁾	49%	50%
Built between 1940 and 1969 ⁽³⁾	51%	50%
Subtotal	100%	100%

(1) Source: Natural Gas and Grid Modernization Study Appendix N Special Study #5

(2) Assumes prevalence of knob-and-tube electrical wiring in homes built prior to 1940.

(3) Residential furnace systems became more prevalent than boiler systems starting in the 1970s.

This information indicates that only one average building size is assumed for the analysis of residential building heat loads for buildings built from 1969 and earlier. The

³³⁶ NYSEG and RG&E, *Final LTP*, 24.

Companies use two age categories of homes: homes built from 1939 and earlier, and homes built from 1940 through 1969, with assumptions applied regarding heating and construction. From 1970 to present, the Companies assume that all homes use furnaces. CRA requested additional details of the segmentation used in a data request. This information was provided in LTGP-23-092. The response provides a table of residential building vintage by decade, from 1940 to present. Approximately 29.6% of the residential buildings in NYSEG's service territory and 28.3% of buildings in RG&E's service territory are assumed to be built prior to 1940. As shown in Appendix A Table A-20 of the LTP, 59% of existing NYSEG and RG&E residential gas customers are assumed to use natural gas forced air furnaces. Table A-20 also shows that 41% of homes use boilers for heating. According to Table A-21 and its footnotes, most of these homes were built prior to 1970. It is likely that many of these homes have had additions or had their heating systems upgraded significantly since their original construction. In their LTP, the Companies have assumed that none of these homes will install heat pumps. CRA believes that there will be significant opportunities to convert these homes to both full and partial electrification and this adjustment should be included in the LTP.

While this data provides a reasonable starting place for this study, CRA recommends that additional building demographic details be added to the Companies' models that will allow heat load and cost conversion estimates to be made that will be more representative of the homes and buildings in the Companies' service territories.

In their January 2024 Energy Efficiency Portfolio report, the Companies have acknowledged "The long-term vision of the CLCPA is to convert all homes to electric heating."³³⁷ CRA recommends the Companies include full electrification in its LTP, rather than only in their alternative scenarios. Further discussion of this topic can be found in Section 3.6.3.

³³⁷ NYSEG and RG&E, *Energy Efficiency Portfolio Proposal*, 41.
<https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C093FF8C-0000-C75A-A771-B16CE298C755}>.

CRA also recommends the Companies develop criteria for a neighborhood that is a candidate for full electrification and, in its LTP, identify potential neighborhoods that fit these criteria, which can include number/percentage of electrified customers, areas with declining gas demand, areas facing replacement of natural gas infrastructure, and whether the area is a 'dead-end' of the gas system.

Additionally, CRA recommends that the Companies perform a more thorough analysis to re-evaluate the partial and full electrification of buildings with boilers in the LTP. While this can be cost-prohibitive for certain customers, others will be able to convert from a boiler to a partially electrified heating system. CRA recommends the application of ductless heat pump systems in this segment that would utilize smart controls/a smart integrated thermostat that would automate decision making on when to utilize the heat pump system versus the boiler system.

The market adoption rates for electrification are based on a linear adoption curve that achieves a maximum adoption at some point in the future based on the details of the specific scenario. For the LTP, the maximum adoption rate is achieved in 2039. The reasoning behind the market adoption rate does not appear to be based on issues that are likely to drive custom adoption, such as payback period, first cost, or customer preference. This has been confirmed in CRA's data requests (LTGP-23-074 and LTGP-23-075).

A methodology needs to be developed to capture the factors that impact customer and market adoption. CRA recommends that the Companies should use principled recent studies by reputable sources to gain an understanding of customer selection and adoption behavior. These studies will inform the level and types of incentives that will be required to meet adoption rates that are used as the basis for the LTP. This will also inform adoption rates that will reflect what might be achievable given specific programs and market incentives. In their reply comments, the Companies have indicated that while they agree with this approach, there are not currently studies available that would inform such an adoption rate. CRA recognizes this issue and further recommends that the Companies include market studies and surveys in its future pilot programs involving electrification that would support the development of the information required to inform improved adoption rate forecasts.

In LTGP-23-180, the Companies confirmed that weatherization and electrification occur independently; in other words, the Companies do not assume that customers weatherize prior to electrifying. As NYSERDA pointed out in their comments on National Fuel Gas' LTP, "NYSERDA's EmPower Plus" program, which offers rebates and low interest financing for heat pump purchases and installations for LMI households, requires weatherization prior to installation to receive incentives. The State is likely to build upon this approach to building decarbonization in which energy efficiency is required prior to electrification."³³⁸ NYSERDA's Integration Analysis, which is their "economywide decarbonization pathways model used to illustrate how New York State can achieve the greenhouse gas emission limits of the Climate Act," posits that their IA Basic Shell weatherization package assumed in their model results in a 27% - 44% reduction in building space heating demand.³³⁹

CRA recommends that the Companies assume that customers weatherize prior to electrifying. This is considered best practice and is required for customers who are receiving certain NYSERDA rebates and incentive programs. This will allow the customers to heat and cool their homes more efficiently, resulting in reduced operating costs. A weatherized dwelling can be fitted with a more optimally sized heat pump, further reducing ongoing energy costs. The Final LTP should include optimally sized heat pumps and the BCA should reflect reduced up-front cost and reduced ongoing energy costs.

In LTGP-23-181, the Companies confirmed that the Coefficient of Performance ("COP") is held constant over time in their decarbonization model. A COP of 3.0 is used for ASHPs.³⁴⁰ NYSERDA's Integration Analysis assumes that by 2030, ccASHP annual seasonal COPs will range from 3.1 to 3.5, depending on building type. By 2040,

³³⁸ NYSERDA, *Comments of the New York State Energy Research and Development Authority*. NY PSC Case 22-G-0610. 13.

³³⁹ NYSERDA, *Modeling Managed Building Electrification in New York State*. 17 – 18. October 18, 2023. Note that the Basic Shell weatherization package includes window upgrade for multi-family buildings but not for single-family (1-4 dwelling unit) homes. For single-family homes, the IA Basic Shell package includes air sealing, attic insulation, and wall and floor insulation.

³⁴⁰ NYSEG and RG&E, *Final LTP Appendix A*, A-23.

this range increases to 3.1 to 3.8. Heat pump performance at peak cold temperatures is also modeled to improve over time, and assumes a backup heating source (10% of ASHPs with a fuel backup and the remaining stock assumes electric backup).³⁴¹

The concept of modeling performance improvement over time is bolstered by fervent support by the U.S. Department of Energy for improving heat pump performance. In 2021, the D.O.E. launched the Cold Climate Heat Pump Technology Challenge, which is “a DOE initiative to accelerate the deployment of heat pump technologies by supporting innovation and manufacturing.” It “brings together public and private sector stakeholders to address technical challenges and market barriers to adopting next-generation cold-climate heat pumps.”³⁴² The challenge is composed of two segments – one for a ccASHP optimized for operations at 5°F, and another for a ccASHP optimized for operations at -15°F.³⁴³

In January of 2024, the D.O.E. announced that eight different manufacturers have successfully passed laboratory testing, meeting the goals of the challenge. More than 23 prototypes will now be tested in various cold-climate locations throughout the U.S. and Canada over the next year.³⁴⁴

For these reasons, CRA recommends the Companies model COP improvement over time, at least consistent with NYSERDA’s *Integration Analysis*, which derives ASHP annual COP improvement from NREL’s 2021 *Electrification Futures Study* “Moderate Advancement” scenario. Assuming no improvement in heat pump efficiency over time biases the LTP against electrification.

³⁴¹ NYSERDA, *Modeling Managed Building Electrification in New York State*. 16 – 18. October 18, 2023.

³⁴² U.S. Department of Energy. *DOE Announces Leading Heat Pump Manufacturers Successfully Develop Next-generation Prototypes to Withstand Subfreezing Weather*.

³⁴³ U.S. Department of Energy, *Residential Cold-Climate Heat Pump Technology Challenge Fact Sheet*; Available from <https://www.energy.gov/eere/buildings/articles/residential-cold-climate-heat-pump-technology-challenge-fact-sheet>.

³⁴⁴ U.S. Department of Energy. *DOE Announces Leading Heat Pump Manufacturers Successfully Develop Next-generation Prototypes to Withstand Subfreezing Weather*.

Additionally, as discussed in Section 3.9.3, the LTP should include both the geothermal heat pump loops and single building GSHPs in the forecast to be more in line with current market activity.

Consistent with the discussion in this section and in Section 3.5, CRA recommends that the Companies model a portion of the customer base converting to full electrification over time in their LTP rather than only in their alternative scenarios. This amount could be informed by market studies over time and adjusted accordingly as the Companies develop a better understanding of customer adoption rates.

3.10. Industrial Customer Assumptions

3.10.1. Background

The CAC Final Scoping Plan presents several emission reduction considerations for the industrial sector. The Final Scoping Plan recognized that industrial customers are highly heterogeneous and require customized solutions for specific industries and even specific customers. It states that in the near term, emission reductions will largely come from energy efficiencies and limited electrification. Greater emissions reductions opportunities, including carbon capture, will more likely occur in the longer term as technologies mature.³⁴⁵

Carbon Capture and Storage (CCS) is an important component to consider in potential future industrial decarbonization. CCS is a process in which CO₂ emissions are captured directly from power plants or industrial processes, compressed and transported (truck, rail, pipeline), and sequestered underground in rock formations that hold the CO₂ permanently.³⁴⁶ Currently, the cheapest carbon capture costs are in the natural gas processing, ammonia production, and methanol production sectors, with costs ranging from roughly \$15 - \$35 per metric ton of CO₂ captured. In other industries

³⁴⁵ New York State Climate Action Council. 258-259. *New York State Climate Action Council Final Scoping Plan*. climate.ny.gov/ScopingPlan. 2022.

³⁴⁶ United States Environmental Protection Agency (EPA), *Carbon Dioxide Capture and Sequestration: Overview*; Available from https://19january2017snapshot.epa.gov/climatechange/carbon-dioxide-capture-and-sequestration-overview_.html.

carbon capture is more expensive, ranging from roughly \$50 - \$120 per metric ton of CO₂ captured.³⁴⁷ There are approximately 15 CCS facilities for permanent storage currently operating in the United States. These are almost all used in the lower cost natural gas, ammonia, and ethanol sectors, and are generally located in the Midwest and Gulf South regions, where those industries are more prevalent.³⁴⁸

3.10.2. Stakeholder & Company Feedback

In their Comments on the Initial LTP, Strategen points out that “the Companies do not have any ongoing or planned industrial carbon capture projects.”³⁴⁹ They add that “there is a significant risk that the Companies’ strategy is unsound and will not result in the initiation of carbon capture projects in 2026, as forecasted.”³⁵⁰

SC/EJ added in their comments that the LTP should consider further opportunities for industrial decarbonization through energy efficiency and electrification. They bring up that the LTP omits electrification of boiler-based systems and process heat, which could contribute significantly to industrial decarbonization. SC/EJ reference resources from ACEEE and the DOE, that assert that using advanced heat pumps can electrify process heating in industrial applications in a cost-effective, efficient manner. SC/EJ urge the companies to utilize industrial heat pumps as soon as possible.³⁵¹

In their comments on the Revised LTP, SC/EJ state that “the Companies fail to acknowledge the significant potential of industrial electrification.” They assert that “the Companies dismissively state that the industrial sector is generally recognized as the most challenging sector to decarbonize without completing a robust analysis of the existing technology and potential energy savings.” SC/EJ cite research on and examples of industrial heat pumps and electrification of high-temperature industrial

³⁴⁷ United States Congressional Budget Office, *Carbon Capture and Storage in the United States*; Available from <https://www.cbo.gov/publication/59832>. Note that these dollar values are in 2019 dollars. December 2023.

³⁴⁸ *Ibid.*

³⁴⁹ Strategen, *Comments on the Initial LTP*, 25.

³⁵⁰ *Id.*, 26.

³⁵¹ Sierra Club and Earthjustice, *Comments on the Initial LTP*, 42-43.

processes. They also state that “the Companies must educate their industrial customers on electrotechnology.” They add that because there is clear potential to electrify industrial customers, the Companies should work with industrial facilities to identify which process can be electrified. SC/EJ conclude by recommending that “in the final LTP, the Companies should identify which of their large industrial users would be best suited for industrial electrification, identify specific barriers associated with widescale applications of industrial heat pumps, and then provide a plan for how the Companies will address these challenges and identify the targeted actions needed, including further research, development, demonstration, and deployment.”³⁵²

3.10.3. Findings

In their LTP, the Companies broke up Industrial decarbonization into three categories: electrification, process energy efficiency, and carbon capture.

Regarding electrification, the Companies assume that some existing gas furnaces and heaters will be converted to ASHPs, and boilers will be replaced with ductless mini-split ASHPs. They consider that larger industrial customers may have multiple heating units which will not necessarily be retired contemporaneously. The Companies separate heating load from processing load and adjust by appliance stock percentages to get percentage of load by appliance. The Companies then assume maximum participation rates and ramp rates for each scenario modeled in the LTP.³⁵³ Maximum participation rates were modeled in a way to achieve target decarbonization levels, and maximum participation rates that vary by scenario and operating company, as described in Chapter VII of the LTP.

To develop process energy efficiency assumptions, the Companies begin with industrial process load percentages as a proportion of total industrial load for NYSEG and RG&E individually. These numbers do not include industrial process load targeted for carbon capture. They then utilize industrial process energy efficiency costs for 2020-2050, as presented in the National Fuel Long-Term Plan. The Companies model

³⁵² Sierra Club and Earthjustice, *Comments on the Revised LTP*, 18-22.

³⁵³ NYSEG and RG&E, *Final LTP Appendix A*, A-29 – A-32.

a 0.5% process load reduction per year in the Companies' CLCPA scenarios and LTP, and a 0.25% process load reduction per year in the Delayed Achievement scenarios, both starting in 2027.³⁵⁴

The Companies developed their carbon capture assumptions by estimating CO₂ avoidance costs for industrial carbon capture. This is done by assuming a carbon avoidance cost for a cement plant and using the same value for all industrial customers for modeling purposes. The Companies then assume transportation costs for sequestered carbon based on the average distance of each service territory from the nearest geological sequestration site.

NYSEG and RG&E assume a 100% capture rate, "meaning that 100% of carbon emissions from participating industrial customers will be captured and stored permanently in geological formations in and around New York State." Lastly, the Companies model a 0.5% annual increase in carbon capture participation in the LTP and Companies' CLCPA scenarios and 0.25% annual increases in the delayed achievement scenarios starting in 2028.³⁵⁵

The Companies have not provided any additional information regarding their approach to industrial GHG emissions reduction, except to describe in more detail their future plans to engage customers in this market segment in order to learn more about potential actions they might take. These would be actions related to process efficiency improvements, electrification opportunities, carbon capture and sequestration options, and the potential applications of RNG and hydrogen.

Given the Companies current level of engagement with their industrial customers on these actions, it would appear that the current forecast of GHG emissions reduction in the industrial segment is very speculative, and may overestimate the potential.

³⁵⁴ *Id.*, A-33.

³⁵⁵ *Id.*, A-33 – A-35.

3.10.4. Recommendations

The Companies did not provide any details supporting the justification of adoption rates for electrification in the industrial sector. Maximum participation rates are set to 30%.³⁵⁶ These maximum participation rates do not appear to be based on any specific studies, programs, or market experience, but were developed to support achieving their target emissions reduction. Similarly, the process energy efficiency load reductions are modeled to increase at an increasing rate over the course of the forecast, but are not based on any referenceable experience, or discussion of how these forecasts might relate to their NENY plans or programs that are supported in their recent rate case. CRA recommends that the companies provide further discussion of how these programs will be developed, and how experience gained in their energy efficiency programs will help to guide their LTP forecasts.

The CCS forecast for the LTP depends on industrial companies pursuing and implementing approaches on a fairly aggressive basis starting in 2028. While there are CCS projects across the country, the technology is still in a very early stage of development, and commercialization requires significant government support to fund most projects. Without a government requirement for GHG emissions reductions, or a market for GHG allowances, industrial companies would have no reason to justify the additional cost for these investments. It is possible that the Cap and Invest Program in NY will help to create such a mechanism, but the regulations and compliance requirements are still under development. Without something like this, it is unlikely industrial companies will pursue these investments. As a result, CRA recommends that the Companies remove industrial CCS as part of their LTP at the current time.

In their “Conclusions and Implementation Actions” chapter, the companies indicate they plan to “propose an industrial carbon capture program and related cost recovery approach, and obtain regulatory approval from Commission in time for 2028 implementation”.³⁵⁷ CRA recommends that the Companies provide annual updates

³⁵⁶ NYSEG and RG&E, *Final LTP*, 96.

³⁵⁷ NYSEG and RG&E, *Final LTP*, 121.

on the progress of these actions and use this information to make appropriate adjustments to the industrial forecast in future LTPs.

3.11. Meeting the Requirements of the Climate Leadership and Community Protection Act

3.11.1. Background

CRA's review of the CLCPA and the Gas Planning Order indicates that the two primary requirements of compliance relate to GHG emissions reductions, and ensuring a minimum percentage of efficiency and clean energy expenses and benefits are given to disadvantaged communities.

The CLCPA states that at least 35%, with a goal of 40%, of the overall statewide benefits of spending on EE and clean energy should go to disadvantaged communities. The CLCPA also establishes an economywide GHG emissions reduction goal of 40% by 2030 and 85% by 2050 compared to 1990 levels. The Gas Planning Order expands on this second point by stating:

While the CLCPA does not impose specific requirements on the State's gas distribution system, rationally, meeting the CLCPA's emissions reductions targets for the entire economy will require emissions reductions from the gas distribution system.³⁵⁸

The Gas Planning Order provides additional guidance in this matter:

CLCPA §7(2) requires that the Commission consider whether its decisions are inconsistent with or will interfere with the attainment of the statewide GHG emissions limits established in Environmental Conservation Law Article 75. Additionally, CLCPA §7(3) requires that the Commission ensure that its decisions do not disproportionately burden disadvantaged communities. Further, CLCPA §7(3) requires that the Commission prioritize reductions of GHG emission and copollutants in disadvantaged communities.

This Order complies with CLCPA §§7(2) and (3). With regard to §7(2), this Order establishes a foundational process through which the Commission can

³⁵⁸ NY PSC, *Gas Planning Order*, 4.

act to ensure that the LDCs reduce GHG emissions in accord with the CLCPA and in contemplation of the CAC's additional work product. The gas system planning process adopted by this Order will ensure that the Commission, Staff, and stakeholders have the information necessary to appropriately evaluate the potential GHG emissions of LDCs' long-term plans and alternatives. With regard to §7(3), the gas system planning process adopted by this Order will provide the Commission with the necessary information to assess the potential impacts of LDCs' long-term plans and alternatives, both benefits and burdens, on disadvantaged communities. ³⁵⁹

The CLCPA requires that at least 35%, with a goal of 40%, of the overall benefits of spending on EE and clean energy should be directed toward disadvantaged communities.³⁶⁰ In addition to the BCA results, benefits to disadvantaged communities will also be considered when the Commission is evaluating the LTP.³⁶¹

3.11.2. Stakeholder & Company Feedback

AGREE states that NYSEG and RG&E's LTP should not be accepted without independent verification because it relies heavily on NFG's assumptions and analysis, which the Commission modified in its *Order Implementing Long-Term Natural Gas Plan with Modifications*.³⁶² Further, AGREE points out that the Companies' plan does not meet GHG reduction targets, and reductions through RNG, hydrogen and backup furnaces are based on "unproven, uncertain, and/or impractical" assumptions.³⁶³

Commissioner Katherine Borgella of the Tompkins County Department of Planning and Sustainability submitted comments which assert the county's commitment to "reaching net zero emissions as soon as possible through beneficial electrification' and

³⁵⁹ *Id.*, 57.

³⁶⁰ New York Senate, *CLCPA*, 16.

³⁶¹ NY PSC, *Gas Planning Order*, 40.

³⁶² AGREE, *Comments on the Initial LTP*, 1-2.

³⁶³ *Ibid.*

its concern that the Companies' LTP will hamper its ability to achieve this goal as it does not do enough to comply with CLCPA.³⁶⁴

Ratepayer and Community Intervenors' Comments on the Initial LTP is also critical that NYSEG and RG&E's LTP fails to plan to comply with CLCPA stating, "[w]hile one can always fall behind at a later date, one can obviously never reach a goal that isn't even set."³⁶⁵

In alignment with other parties, SC/EJ state that "neither the Companies' initial LTP nor the scenarios analyzed in developing the LTP achieves an emissions reduction trajectory 'consistent' with the statewide greenhouse gas emission reductions mandated by CLCPA."³⁶⁶ While none of the Companies' scenarios lead to compliance with CLCPA, the Companies' presented "delayed achievement" scenarios that were designed to be non-compliant.³⁶⁷ Further, the Companies, cited "a number of commitments made in their rate case Joint Proposal (Case 22-E-0317)" as a basis for their CLCPA-non-compliant planning.³⁶⁸ SC/EJ believe this is inappropriate as an LTP should plan for full compliance where other proceedings, like rate cases, merely nudge utilities towards incremental compliance in the short term.³⁶⁹

Again, Strategen points out that "[t]he Companies' LTP Pathway does not provide an approach to meeting the 2050 CLCPA emissions target."³⁷⁰ Further criticisms include that

[t]he Companies have presented an LTP filing in which three out of five scenarios, including their preferred LTP Pathway, are not forecasted to meet emissions requirements. Rather than developing portfolios of resources that can

³⁶⁴ Tompkins County Department of Planning & Sustainability, *Comments on the Initial LTP*, 1.

³⁶⁵ Ratepayer and Community Intervenors, *Comments on the Initial LTP*, 1.

³⁶⁶ Sierra Club and Earthjustice, *Comments on the Initial LTP*, 12.

³⁶⁷ *Ibid.*

³⁶⁸ *Id.*, 10.

³⁶⁹ *Id.*, 10-11.

³⁷⁰ Strategen, *Comments on the Initial LTP*, 23.

*comply with the CLCPA, the Companies tailored their LTP Pathway and two Delayed scenarios to meet arbitrary emissions targets that fall short of the CLCPA.*³⁷¹

But not only is the LTP Pathway noncompliant; the analyses are insufficient. These LTP shortcomings include failure to develop “analyses quantifying the risk of volatile gas prices, the risk of constrained RNG supply, the risk of not meeting emissions reduction targets or the risk of policy changes.”³⁷²

The Companies state that the Initial LTP is in fact compliant with the CLCPA. They bring up that the Gas Planning order did not place specific GHG reduction requirements upon individual LDCs, but rather stated that “planning must be conducted in a manner consistent with the recently enacted Climate Leadership and Community Protection Act (CLCPA).”³⁷³ The Companies also state that the Commission, in the NFG LTP Order, found that “our action here, requiring modifications and improvements to NFG’s long-term plan, is not inconsistent with nor interfering with the CLCPA.”³⁷⁴ They bring up that Stakeholders assert that the Companies must meet specific GHG emissions reductions targets and be on track to reduce emissions by 85% by 2050, compared to 1990 levels. The Companies state that the “LTP provides for significant GHG emissions reductions and makes meaningful contributions to the GHG emissions reduction goals of the CLCPA as it projects a reduction in GHG emissions by 2043 by 58 percent and 51 percent from 1990 levels for NYSEG and RG&E, respectively. Thus, the Companies’ LTP satisfies the Commission’s standard of being consistent with the CLCPA.”³⁷⁵

NYSERDA states in their comments on the Revised LTP that “the LTP must be strategically aligned with long-term Climate Act decarbonization requirements.” They

³⁷¹ *Id.*, 7.

³⁷² *Id.*, 11.

³⁷³ NY PSC, *Gas Planning Order*, 4.

³⁷⁴ NY PSC, *NFG LTP Order*, 59.

³⁷⁵ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 6.

assert that the Companies should not only reduce emissions through 2043, but also align their actions with longer term Climate Act decarbonization requirements.³⁷⁶

3.11.3. Findings

If implemented, the Companies LTPs would significantly reduce emissions compared to their reference case baseline. According to the LTP, by 2043, NYSEG and RG&E's LTPs reduce emissions by 55% and 50% compared to 1990 levels, respectively.³⁷⁷

It is also worth noting that the CLCPA goals are economywide. Therefore, the gas utilities have not been given prescriptive emissions reduction targets. However, gas utilities are undoubtedly an important sector to decarbonize in order for New York to reach its goals. As stated in the CAC Final Scoping Plan:

*All the information before the Climate Action Council (Council) indicates that achievement of the emission limits will entail a substantial reduction of fossil natural gas use and strategic downsizing and decarbonization of the gas system.*³⁷⁸

When considering the starting point in 2024 of 8.5% or 11.3% lower than 1990 levels, seeing reductions of 55% and 50% by 2043 is substantial progress. However, whether the LTP's emissions reductions meet the goals set forth in the CLCPA is a reasonable point of comparison.

As stated previously in Section 3.10.1, the CLCPA's emissions reduction targets are 40% by 2030 and 85% by 2050 compared to 1990 levels. The Companies' LTP does not reduce emissions at a level consistent with the statewide 2030 goals and does not put the Companies on a trajectory to achieve GHG emissions reductions consistent with the 2050 goal either.

CRA recognizes the challenges of meeting the 2030 goal. Given where the Companies are currently in terms of emissions reductions, it might be unrealistic that they could

³⁷⁶ NYSERDA, *Comments on the Revised LTP*, 22.

³⁷⁷ NYSEG and RG&E, *Final LTP*, 101.

³⁷⁸ CAC, *Climate Action Council Final Scoping Plan*, 350.

successfully submit their Final LTP, receive the Commission's acceptance for said LTP, and set up and implement all related programs in time for emissions to be reduced at a level consistent with the 2030 CLCPA goals. The ramp-up time necessary for these programs and practices to begin meaningfully reducing emissions results is likely not feasible to meet the 2030 goals.

Though directionally consistent with CLCPA targets, reductions of 55% and 50% by 2043 (for NYSEG and RG&E, respectively) do not put the Companies on a trajectory to reduce emissions by 85% compared to 1990 levels by 2050.

3.11.4. Recommendations

Regarding disadvantaged communities, please see Section 3.15 for further discussion.

The level of emissions reduction in the LTP is, of course, dependent on the programs and plans the Companies have recommended in their LTP. For example, increasing electrification participation or weatherization levels would further reduce emissions. Each incremental metric ton of CO₂e reduced comes at an associated cost. The Companies' LTP represents their best efforts to reduce emissions while not overburdening customers with increased bills. See Section 3.14 for discussion regarding the impacts on customer bills of the LTP.

Two of the Companies' alternative scenarios ("CLCPA Full" and "CLCPA Hybrid") do put them on a path to achieve at least 85% emissions reduction compared to 1990 levels by 2050 according to the Companies' calculations.

CRA's recommendations throughout this report include an increase in electrification (including some full electrification rather than hybrid heating) and various other measures. These measures will serve to reduce the Companies' peak demand and allow them to begin to strategically downsize the system and reduce both operations and maintenance ("O&M") costs and fixed pipeline and storage capacity fixed costs over time. This will in turn reduce costs to customers while maximizing emissions reduction, putting the Companies on a better path toward meeting the CLCPA's emissions reduction targets.

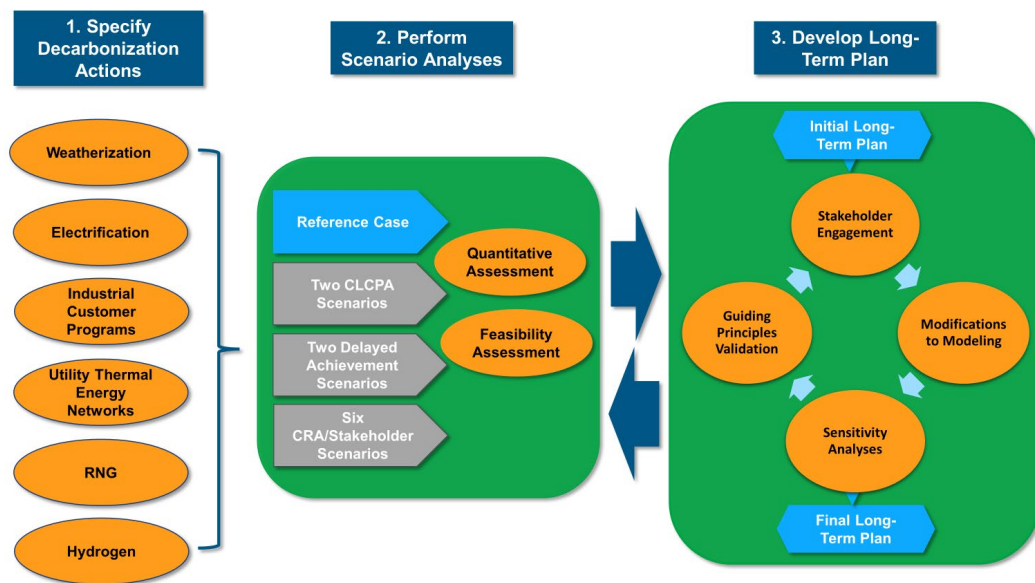
The NY PSC has also confirmed that the gas planning process should ensure gas utilities “reduce gas infrastructure and GHG emissions in a manner consistent with the CLCPA.”³⁷⁹ While the CLCPA’s targets do not specifically require gas utilities to reduce emissions by 85% by 2050, absent other guidance, it is reasonable to assume that gas utilities will need to meaningfully reduce emissions.

3.12. NYSEG and RG&E Long-Term Plan Methodology (Decarbonization Model)

3.12.1. Background

The Companies have developed a three-step process that led to the development of the Final LTP, which is presented in Figure 3-10 below.³⁸⁰ The three steps include 1) Specify Decarbonization Actions, 2) Perform Scenario Analysis, and 3) Develop LTP.

Figure 3-10: Figure V-2 from the Companies LTP



Each decarbonization action has assumptions regarding cost and effectiveness for achieving fuel savings and emissions reduction over the 20-year forecast period. To

³⁷⁹ NY PSC, *Rate Order*, 52.

³⁸⁰ NYSEG and RG&E, *Final LTP*, 59.

analyze the potential assumptions, the Companies developed a model that captures the key quantitative metrics and estimates of the decarbonization impacts in a way that allows them to perform trade-off studies or run scenarios. In the LTP, they include a Reference Case that represents the Companies' baseline (or business-as-usual) forecast for the next 20 years. It should be noted that this case does not include any CLCPA actions, so it represents expectations that the Companies had prior to these requirements. In addition to the Reference Case, the Companies have developed the following four additional scenarios:

1. CLCPA Full Electrification
2. Delayed Achievement Full Electrification
3. CLCPA Hybrid Heating
4. Delayed Achievement Hybrid Heating

The details of these scenarios are discussed in more detail in other parts of this report.

Using the results of these scenarios, the Companies have conducted a quantitative assessment and feasibility assessment to inform the selection of a LTP scenario.

The Companies have also developed a set of guiding principles that are used to evaluate the overall attractiveness of the outcome of the assessment. These six guiding principles are noted in Section 1.7.

It is notable that the Companies have specifically identified customer choice in their LTP as a guiding principle that will impact end-use equipment and energy decisions in the future. The current regulatory structure in New York allows customers to choose their fuel/heating source. The changes occurring as a result of Governor Hochul's 2023 executive budget will only apply to certain categories of new construction.

The Companies also identify the related issue that mandates that restrict choice are likely to be met by customer opposition, which will be influenced by issues of cost and convenience. While the Companies have noted the importance of customer choice as

a factor that will impact the adoption of end-use equipment, they also note in their LTP that they have not attempted to address this issue in their models.

In conducting their quantitative assessment, they have focused on three key metrics as they consider the tradeoff of options. These three metrics include:

1. Reductions in GHG Emissions – annual GHG emissions for the entire supply and delivery chain from gas production through consumption for all customers. This includes scope 1, 2 and 3 GHG emissions.
2. NYSEG and RG&E Gas Bill Impacts – incremental costs that are likely to be recovered through rates paid by the Companies' customers and will increase NYSEG and RG&E's revenue requirements and base rates.
3. Decarbonization Policy Costs – Costs incurred as a result of the Companies' decarbonization actions but subject to recovery that will be determined by policy makers.

3.12.2. Stakeholder & Company Feedback

SC indicated that the LTP relies on unreasonable assumptions about electrification and electric and gas price forecasting. The comments address issues related to the market adoption rates of electrification and discuss the cap on the percentage of customers who electrify as being arbitrary. They also discuss the impact that Cap-and-Invest may have on gas prices in the future, and the lack of running sensitivities on gas price increases, which have been shown to have a significant impact on costs in studies conducted by Puget Sound Energy in Washington State, where a Cap-and-invest program has been implemented recently. Sensitivities related to gas price variations would provide stakeholders with insight into the potential impact of these types of programs.³⁸¹

Strategen and SC recommend that additional scenarios be run that modify other assumptions. SC discussed scenarios developed in long term plans developed by

³⁸¹ Sierra Club/Earthjustice, *Comments on the Initial LTP*, 19 – 23.

Northwest Natural and Puget Sound Energy in their recent Integrated Resource Plans (IRPs), that provide more robust modeling approaches to assist in developing preferred plans.³⁸²

Several of the stakeholders commented on the cost impact of including hydrogen and RNG in the LTP, and requested these alternative fuels be removed from the plan.^{383,384}

In their comments on the Revised LTP, SC and Earthjustice state that the Companies' appear to be inappropriately inflating electricity prices in the full electrification scenarios. They note that the Companies' use of the NYISO System Resource Outlook ("SRO") Base Case should not be used for the Companies' LTP and Hybrid heating scenarios, as it does not achieve CLCPA goals. Additionally, they state that the use of the 42% Clean Generation Supply Adjustment unnecessarily inflates electric prices.³⁸⁵

3.12.3. Findings

In developing their LTP, the Companies have used their Guiding Principles and indicated they have attempted to be as aggressive as possible with respect to GHG reductions, while balancing cost and affordability. For each of the six decarbonization measures included in the LTP, they have selected an approach they feel is achievable, while balancing these key metrics. Table 3-8 below shows the Companies' Specifications of the LTP summary.

³⁸² *Id.*, 13 – 15.

³⁸³ *Id.*, 24 – 25

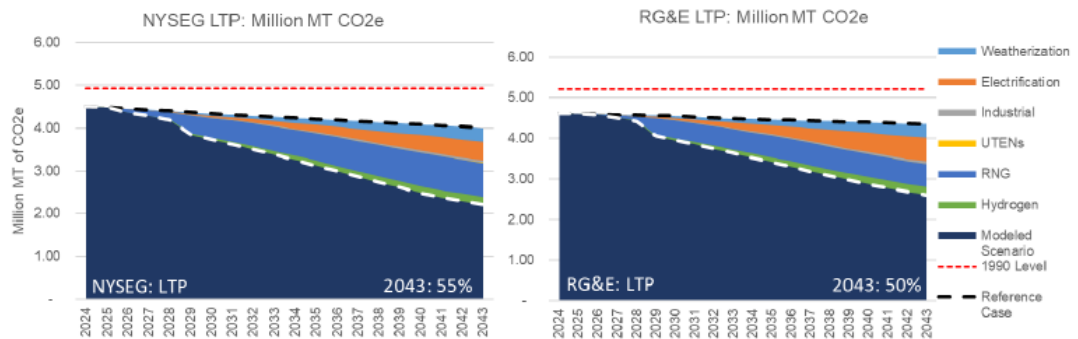
³⁸⁴ AGREE, *Comments on the Initial LTP*, 5.

³⁸⁵ Sierra Club/Earthjustice, *Comments on the Revised LTP*, 8 – 10.

Table 3-8: Specifications of the Companies LTP (LTP Table VI-2)

	Action	Recommended LTP
1	Weatherization	• Residential: 1% of homes/year in 2027, incremental participation growing by 0.25%/year. • Commercial: 0.5% incremental heat load reduction/year • Municipal: 1% incremental heat load reduction/year
2	Electrification	• All segments convert customers with furnaces to hybrid heating systems (standard ASHP paired with gas furnace) at equipment end-of-life • Residential: Pace ramps up at 5.4%/year until it reaches a peak of 75% • Commercial: Pace ramps up at 2.1%/year until it reaches a peak of 30% • Municipal: Pace ramps up at 3.6%/year until it reaches a peak of 50%
3	Industrial Customer Programs	• Energy Efficiency of Process Load: 0.5% process load reduction/year • Electrify Space Heating: Convert customers with furnaces to hybrid heating systems (standard ASHP paired with gas furnace) at equipment end-of-life at a pace that ramps up at 2.1%/year until it reaches a peak of 30% • Carbon Capture: (large customers) 0.5% carbon capture/year starting in year 2028 achieving 8% carbon capture by 2043
4	UTENs	• 2035 start, one project of 24 residential and 8 non-residential buildings every other year
5	RNG	• 2026 start, Optimistic Growth level of RNG in LDC territory, plus 2% of RNG in PA and OH
6	Hydrogen	• 2028 start, blend incremental 1.25%/year

The resulting LTP is projected to reduce GHG emissions by 55% for NYSEG and 50% for RG&E by the end of 2043, compared to 1990 emissions levels. The chart in Figure 3-11 provides a graphic summary of the results, and contributions from each of the decarbonization actions.

Figure 3-11: LTP Contributions to GHG Emissions Reductions (Figure VI-5 from LTP)

The Companies describe their electric supply price forecasting methodology in the LTP's Appendix B. The Companies first estimate annual average 2021 \$/kWh electric price supply components by customer segment using Edison Electric Institute's Winter 2022 Typical Bills and Average Rates Report. They adjust those values for 2022 – 2024 using historical and NYMEX forwards using NYISO Location-Based Marginal Prices ("LBMPs"). They then use NYISO's SRO LBMP differentials to shape the electric prices, resulting in seasonal average prices derived from monthly prices.³⁸⁶

Finally, two adders are layered on top of the supply costs:

- 1) A "Clean Generation Supply Adjustment" of 39% in 2035 and 42% in 2042 in all scenarios and the LTP to account for the fact that all the Companies' scenarios achieve zero-emission electricity by 2040 (a key target included in the CLCPA).
- 2) For the Full Electrification scenarios only, an "Electrification Supply Adjustment" of 1.48% annually to account for additional winter electric capacity needs.³⁸⁷

3.12.4. Recommendations

The overall approach and methodology used to develop the LTP is logical and appears to be fairly comprehensive based on CRA's initial review. The modeling approach provides a basis for understanding some of the key actions that can be performed to reduce emissions, but it does not provide an understanding of how this might be accomplished and the barriers to implementing these actions. The methodology would benefit from incorporating approaches to address these issues.

In the discussion of the methodology in the Initial LTP, the Companies referred to the JP that, at the time the report was being written, was before the Commission for consideration. The JP includes several provisions that will contribute to emissions

³⁸⁶ NYSEG/RG&E, *Revised LTP Appendix B*, B-8 – B-12.

³⁸⁷ *Id.*

reductions in a manner consistent with the CLCPA and actions proposed in the LTP. These provisions include specific program enhancements, pilots, and investments that are identified with other LTP action items. An example of this is provided in footnote 122 of the LTP, which says, “For example, the Joint Proposal includes commitments to implement energy efficiency and electric heat pump programs and continue aggressive leak repair practices along with other commitments related to climate change.” In its Initial Findings Report, CRA recommended that the Companies list the specific activities that are included in the Rate Order adopting the JP and show the impact on emissions reductions or energy savings and discuss how these programs will be leveraged to inform the LTP forecast in the future.

The Companies did include further description of these items in their “Conclusions and Implementation Actions” chapter of the Final LTP.³⁸⁸ CRA recommends that the Companies describe specifically how each of these programs from the JP are considered in the Companies’ LTP modeling of the impact of energy efficiency on gas consumption and the adoption of heat pumps. For example, the grants being provided to customers for heat pumps that are meant to supplement other incentives should be discussed further. Also, any specific goals that are described in those programs should be discussed in the LTP.

CRA recommends that in future revisions of its model and LTP, these issues be addressed more directly due to the importance of understanding the relationship between cost, convenience, and customer choice, and the impact they will have on the adoption of various decarbonization measures. These issues will only be understood through performing research, customer surveys, demonstrations and other approaches that will provide a more complete understanding of costs, performance, customer behaviors, and impact on fuel consumption and emissions. The Companies should utilize a decarbonization model that includes incentives as a benefit and estimates adoption based on customer cost, rather than pre-setting an adoption rate.

³⁸⁸ NYSEG and RG&E, *Final LTP*, 119 – 123.

The scenarios selected in the Companies LTP illustrate some of the issues associated with changing assumptions regarding the adoption of the various decarbonization measures, such as full electrification, changes in weatherization, and other assumptions. CRA and the stakeholders have recommended additional scenarios to help in understanding the impact of removing hydrogen and RNG, and increasing the adoption of full electrification. These scenarios are discussed in more detail in Section 3.18 of this report.

In response to SC's recommendation, the Companies ran sensitivities related to gas commodity price assumptions, which can be found in Table VI-5 of the Revised LTP. These sensitivities show that the LTP results are not overly sensitive to gas commodity price assumption changes.

In its Preliminary Findings Report, CRA recommended that similar sensitivities be run with electric price variations to allow understanding of how that will impact cost differences. In response to this recommendation, the Companies have calculated sensitivities for +/-20% in all-in electric prices. Results show that a 20% reduction in electric prices reduces total LTP cost by 6.3% for NYSEG and 6.5% for RG&E.³⁸⁹

Regarding electric price forecasting, CRA recommends the Companies reevaluate their methodology for the LTP and all scenarios. CRA's internal analysis suggests that the Companies are likely significantly overstating the modeled residential customer electric supply prices in both the LTP and Full Electrification scenarios. This may be resulting in supply price increases that are 200% - 300% overinflated by 2035 in the RG&E CLCPA Full Electrification scenario, for example.

Cumulatively, the two adjustments lead to a 191% multiplier added to the supply prices in the Full Electrification scenarios. This multiplier is calculated using the values provided on page B-12 of the Companies' LTP Appendix B for the Clean Generation Supply Adjustment (39% in 2035 and 42% in 2042), assuming linear interpolation in

³⁸⁹ NYSEG and RG&E, *Final LTP*, 116.

remaining years and the 1.48% annual Electrification Supply Adjustment. The calculation is as follows:

Table 3-9: Total Supply Adjustment Multiplier Calculation

Year	Electrification Supply Adjustment (Cumulative, 1.48% per year)	Clean Generation Supply Adjustment	Total Supply Adjustment Multiplier
2024	101%	1.00	101%
2025	103%	1.04	107%
2026	105%	1.07	112%
2027	106%	1.11	117%
2028	108%	1.14	123%
2029	109%	1.18	128%
2030	111%	1.21	134%
2031	112%	1.25	140%
2032	114%	1.28	146%
2033	116%	1.32	152%
2034	118%	1.35	159%
2035	119%	1.39	165%
2036	121%	1.39	168%
2037	123%	1.40	172%
2038	125%	1.40	175%
2039	127%	1.41	178%
2040	128%	1.41	181%
2041	130%	1.42	185%
2042	132%	1.42	188%
2043	134%	1.42	191%

CRA also agrees with Sierra Club’s comments that the Companies should not use the NYISO SRO Base Case LBMP differentials as the basis for shaping the annual prices into monthly prices for their LTP and Hybrid heating scenarios, as the NYISO SRO Base Case does not assume CLCPA targets are met.

The Companies can utilize the NYISO SRO Policy Case Scenario 1 LBMPs (as that scenario meets CLCPA targets and includes a significant increase in capacity due to a higher peak demand) instead of the SRO Policy Case Scenario 2 (which assumes a

more moderate peak demand).³⁹⁰ This would remove the need for the Clean Energy Generation Adjustment, as the Policy Case Scenario 1 already accounts for meeting CLCPA goals and a higher peak demand.

Another important factor for the electric pricing is the starting supply price used for 2023. CRA's internal analysis suggests that the initial 2023 value used in the supply cost forecast (prior to adding in the Electrification Supply Adjustment and Clean Generation Supply Adjustment) is significantly higher than the NYISO historical LBMPs for 2023 in Zones B (RG&E) and C (NYSEG). CRA recommends updating the electric price forecast to use actual historical NYISO LBPM data from 2022 and 2023 the starting point, rather than using outdated NYMEX forwards.

3.13. Emissions Accounting

3.13.1. Background

The Gas Planning Order requires LDCs to report the GHG emissions impacts of all solutions considered, with calculations of emissions for each scenario submitted.³⁹¹ It also requires compliance with the CLCPA.

Understanding the impacts on emissions of each proposal is critical, and key to that understanding is ensuring that the calculation of these emissions is done in a transparent and reasonable manner.

The conventional methodology for calculating emissions worldwide used by the U.S. Environmental Protection Agency ("EPA") in its national GHG emissions reports and by other national governments when reporting on emissions was developed by the Intergovernmental Panel on Climate Change ("IPCC") for national parties to the United

³⁹⁰ New York Independent System Operator, *2021-2040 System & Resource Outlook*, 9. Sept. 22, 2022. <https://www.nyiso.com/documents/20142/33384099/2021-2040-Outlook-Report.pdf>.

³⁹¹ NY PSC, *Gas Planning Order*, 47.

National Framework Convention on Climate Change (“UNFCCC”).³⁹² The scope of emissions considers only in-state sources of emissions.

However, the CLCPA requires a different accounting method (“CLCPA Format”), as it defines “Statewide greenhouse gas emissions” as follows:

*The total annual emissions of greenhouse gases produced within the state from anthropogenic sources and greenhouse gases produced outside of the state that are associated with the generation of electricity imported into the state and the extraction and transmission of fossil fuels imported into the state.*³⁹³

In a September 2022 whitepaper, NYSERDA provided GHG emissions factors and a summary of the difference between the CLCPA emissions accounting method and the IPCC method:

*The most important difference between IPCC accounting and Climate Act accounting relevant to avoided GHG emissions from fossil fuels is the Climate Act’s mandate to include impacts of upstream emissions from fossil fuels, including the emissions associated with extraction, production, and transportation of the fuel occurring outside state boundaries.*³⁹⁴

The other main differences between the accounting methodologies are the GWP values used and the use of gross *and* net emissions totals.

Commission Case 22-M-0149 addresses utility compliance with the CLCPA and is an ongoing proceeding. In December 2022 within Case 22-M-0149 (and supplemented in May 2023), the Joint Utilities proposed a methodology for calculating gas system-wide emissions developed specifically for the gas utility industry.³⁹⁵

³⁹² New York Department of Environmental Conservation, “2022 Statewide GHG Emissions Report: Summary Report,” 2022, 3-5.

³⁹³ New York State Senate, Bill S6599 of 2019, 6.

³⁹⁴ NYSERDA, “Fossil and Biogenic Fuel Greenhouse Gas Emission Factors,” NYSERDA Report Number 22-23, 2022, Revised May 2023, Prepared by Energy and Environmental Economics, Inc.

³⁹⁵ NYSEG and RG&E, *Joint Proposal*, NY PSC Case 22-M-0149.

3.13.2. Stakeholder & Company Feedback

SC/EJ note that the Companies' emissions accounting for RNG is inconsistent with the CLCPA, resulting in an overstatement of the emissions reductions for RNG.³⁹⁶ If CLCPA-compliant GHG emission accounting were applied, the two NYSEG/RG&E CLCPA scenarios would not meet the emissions reduction targets of the CLCPA.³⁹⁷

SC/EJ state that the "Companies vastly overstate potential emissions benefits from alternative fuels."³⁹⁸ But moreover, the "Companies emissions accounting method is not CLCPA-compliant."³⁹⁹

3.13.3. Findings

NYSEG and RG&E's LTP Appendix E discusses the Companies approach for calculation of GHG emissions. Emissions are calculated by estimating carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) across Scope 1, Scope 2, and Scope 3 sources. These GHGs are converted into CO₂e, to allow for easier comparison of emission reductions. The Companies use the 20-year IPCC Fifth Assessment Report GWP values, consistent with the CLCPA format.

Scope 1 emissions are comprised of "emissions from operating NYSEG and RG&E's distribution, transmission, and gathering segments."⁴⁰⁰ These are calculated for the Companies mains, services, meters, and various other sources. Mains and services emissions were calculated by a density and volumetric approach, while meter emissions were computed by applying an emission factor to the total number of meters per customer segment.

³⁹⁶ SC/EJ, *Comments on the Initial LTP*, 13.

³⁹⁷ *Ibid.*

³⁹⁸ *Id.*, 33.

³⁹⁹ *Id.*, 34.

⁴⁰⁰ NYSEG and RG&E, *Final LTP Appendix E*, E-10.

Scope 2 emissions are “indirect emissions from purchased electricity for operations.”⁴⁰¹ Emissions for the major GHGs were calculated by using projected emissions factors multiplied by electric usage.

Scope 3 emissions “are indirect emissions resulting from assets not owned or controlled by NYSEG and RG&E but related to NYSEG and RG&E’s operations.”⁴⁰² These emissions come from end user combustion and “imported gas.”⁴⁰³ End-user emissions were estimated using total end use throughput multiplied by applicable emissions factors. Imported gas is broken up into in-state and out-of-state components, as the emissions from upstream production and transportation vary greatly based on production location. The Companies have assumed that 1990 out-of-state gas is from the Gulf Coast, and 2024-2043 out-of-state gas is Appalachian shale production. Imported gas emissions will be calculated in a similar manner to end user consumption but with different emissions factors.

3.13.4. Recommendations

As the LTP process evolves, NYSEG and RG&E should continue to assess their methodology for emissions accounting, following guidance from state and federal regulators.

3.14. Benefit-Cost Analysis

3.14.1. Background

The Gas Planning Order recognizes that LDCs must quantitatively and qualitatively describe the benefits and costs of any NPAs using a BCA. The Commission’s 2016 Order Establishing the Benefit-Cost Analysis Framework (“2016 Order”) established the methodology for conducting a BCA.⁴⁰⁴ While the 2016 Order was part of New York’s Reforming the Energy Vision (“REV”) proceeding and applies specifically to

⁴⁰¹ *Id.*, E-22.

⁴⁰² *Id.*, E-25.

⁴⁰³ Defined as gas imports into the Companies distribution system.

⁴⁰⁴ NY PSC, *Order Establishing the Benefit Cost Analysis Framework*. Case 14-M-0101. January 21, 2016.

utilities screening REV-related initiatives and investments and established the parameters used predominantly to analyze investments related to electric utilities, the REV proceeding laid the foundation for conducting BCAs for gas LDCs as well.

New York utility BCA Handbooks were developed as required by the 2016 Order and are updated every two years. NYSEG and RG&E do have an Electric BCA handbook.⁴⁰⁵ Handbooks must be consistent with the BCA framework from the 2016 Order. As stated in the 2021 New York DPS Staff Gas System Planning Process Proposal:

*This BCA Framework has subsequently been adapted by gas utilities in New York to develop BCA Handbooks for NPAs. These BCA Handbooks describe and quantify benefit and cost components and their applications in evaluating NPAs compared to traditional gas infrastructure investments.*⁴⁰⁶

These handbooks contain various NPA-related benefit and cost categories, but the Commission acknowledged more work needs to be done, and the Gas Planning Order's implementation of an ACGWG indicates that modifications to the BCA Framework for gas utilities may occur in the future.⁴⁰⁷

While New York utilities such as Con Edison have conducted BCAs for specific NPAs to replace traditional infrastructure investments, the BCA Framework Order was much more explicit on how to calculate certain cost and benefit streams for electric utilities, thus allowing for some discretion by New York gas utilities. The Commission does not approve specific company handbooks.

The 2016 Order was intended to cover both gas and electric investments. In September 2020, Con Edison filed a proposal to pursue NPAs that addressed BCAs

⁴⁰⁵ NYSEG and RG&E, *Benefit Cost Analysis (BCA) Handbook / Version 4.0*, June 30, 2023.

⁴⁰⁶ NY PSC Staff, *Staff Gas System Planning Process Proposal*, Case 20-G-0131, February 12, 2021, 22.

⁴⁰⁷ Through the Gas Planning Order, the Commission created the Avoided Cost of Gas Working Group, which will address issues "including, but not limited to: commodity, peaking, and pipeline capacity costs; the marginal cost of gas related to transmission and distribution facilities; gas for company use; and system losses."

in Case 19-G-0066. As the Companies state in their LTP, some gas-related BCA items do not have clear guidelines.⁴⁰⁸

The work of the ACGWG and/or future Commission guidance could alter some of the calculations included in the BCAs for LDCs. Stakeholders will be able to provide feedback throughout the process on BCAs and are encouraged to participate in the ACGWG.

3.14.2. Stakeholder & Company Feedback

AGREE believes the Companies' cost estimates and BCAs require additional scrutiny, noting that "adjusting some faulty assumptions can drastically change the Benefit Cost Analysis (BCA) of the different long-term pathways."⁴⁰⁹ AGREE believes the Companies should treat incentives as a benefit rather than a cost, consider the impact of New York's cap-and-invest policy within its BCAs, and verify the consistency of their costs for hydrogen and RNG.⁴¹⁰

Likewise, Ratepayer and Community Intervenors state "The relative costs used in the comparisons don't take externalized costs into account. The LTP should consider required environmental, state and local mitigation costs in each of the comparisons."⁴¹¹

Echoing this concern, SC/EJ says, "the Companies nowhere factor the impacts—or even the risk of impacts—of the forthcoming cap-and-invest regulations into their modeling or analysis," further stating that this is unreasonable.⁴¹²

While Multiple Intervenors did not question the assumptions that informed the Companies BCAs, Multiple Intervenors noted that the Company's BCAs demonstrated that NYSEG and RG&E's planned compliance paths are not cost effective and, therefore,

⁴⁰⁸ NYSEG and RG&E, *Final LTP*, 109.

⁴⁰⁹ AGREE, *Comments on the Initial LTP*, 7.

⁴¹⁰ *Id.*, 7-8.

⁴¹¹ Ratepayer and Community Intervenors, *Comments on the Initial LTP*, 2.

⁴¹² SC/EJ, *Comments on the Initial LTP*, 21.

do not provide societal benefits commensurate with the societal costs. Multiple Intervenor clearly state that non-cost-effective strategies should not be pursued.⁴¹³

Echoing the need that the BCAs need to be scrutinized, SC/EJ note that incorrect emissions accounting results in the Companies' CLCPA-consistent scenarios having overstated benefits.⁴¹⁴

SC/EJ note that "The Companies include all the costs of electrification but decline to identify or include a critical piece of the savings."⁴¹⁵

Strategen asserted that the Companies' presentation of BCAs makes analysis of their assumptions difficult. "Specifically, the Companies identified the formulas used to generate the Benefit-Cost Analysis and the emissions calculations as confidential. Consequently, the outputs are hardcoded. Hardcoding workpapers severely limits Strategen's review of the accuracy and reasonableness of the inputs."⁴¹⁶ While some assumptions, however questionable, were uncovered through conversations with the Company, Strategen would in general appreciate greater transparency in the presentation of BCAs.⁴¹⁷ Strategen submitted various data requests in which the Companies were unable to provide the information/calculations Strategen was requesting due to confidentiality. For example, please see LTGP-23-101 in the Appendix.

In their comments on the Revised LTP, NYSERDA asserts that the Companies should take into account health benefits in their BCA calculations. They note that the Companies state that their BCA analysis only includes energy benefits, not others such as health benefits. NYSERDA states that there are significant health benefits associated

⁴¹³ Multiple Intervenor, *Comments on the Initial LTP*, 17-19.

⁴¹⁴ SC/EJ, *Comments on the Initial LTP*, 13.

⁴¹⁵ *Id.*, 17.

⁴¹⁶ Strategen, *Comments on the Initial LTP*, 6.

⁴¹⁷ *Ibid.*

with combustion pollutant reductions, and the Companies should include these benefits in their BCA analysis.⁴¹⁸

SC/EJ in their reply comments agree with CRA that the Companies should treat federal incentives as benefits under the Societal Cost Test (SCT). They state that while the costs to New York of programs such as HOMES and HEEHRA are essentially fixed, the benefits are not. If more New Yorkers take advantage of benefits, they will continue to benefit. SC/EJ cite the California Public Utilities Commission, which explicitly stated that “Federal incentives would be measured as a benefit.” They add that “the societal cost test should reflect greater utilization by New Yorkers of federal incentives as the economic benefit that it is.”⁴¹⁹

3.14.3. Findings

CRA concurs with the Companies’ use of the societal cost test as the primary BCA and its use of this BCA on a portfolio level.

While the Companies now do estimate incentives more granularly using specific existing programs (see Appendix A, page A-7 of the Final LTP), the Companies do not treat federal incentives as a benefit in their BCA calculation.⁴²⁰ As seen in Case 18-E-0138, the Commission has approved BCA analyses in the past that treat federal incentives as a benefit. For the purposes of the SCT, the Commission recognizes federal rebates and incentives as a benefit to NYS ratepayers.

Please see Table 3-10 and Table 3-11 below for BCA results presented in the LTP.⁴²¹

⁴¹⁸ NYSERDA, *Comments on the Revised LTP*, 14-15.

⁴¹⁹ Sierra Club and Earthjustice, *Comments on the Revised LTP*, 11-13.

⁴²⁰ NYSEG and RG&E, *Final LTP*, 109-110.

⁴²¹ *Id.*, 108 – 109.

Table 3-10: NYSEG BCA Results

Benefit Cost Analysis – NPV (\$) (Discount Rate 6.58%)	NYSEG LTP SCT	NYSEG LTP UCT	NYSEG LTP RIM
Benefit: Avoided Gas Costs (\$)	\$(580,325)	\$(580,325)	\$(580,325)
Benefit: Avoided Gas System O&M and CapEx Rev Req (\$)	\$(7)	\$(7)	\$(7)
Benefit: Avoided Pipeline and Storage Fixed Costs (\$)	\$(28,030)	\$(28,030)	\$(28,030)
Benefit: Avoided Emissions, Societal Cost (\$)	\$(717,263)	N/A	N/A
Total Benefit (\$)	\$(1,325,625)	\$(608,362)	\$(608,362)
Cost: Incremental Electricity Cost (\$)	\$791,357	N/A	N/A
Cost: Weatherization Cost (\$)	\$349,269	\$252,771	\$252,771
Cost: Weatherization Cost- Federal & State Incentive	\$53,914	N/A	N/A
Cost: Weatherization Cost (\$) - Utility Incentive	\$252,771	\$252,771	\$252,771
Cost: Weatherization Cost (\$) - Participant Customer	\$42,584	N/A	N/A
Cost: Net Installed Cost (\$)	\$457,037	\$166,516	\$166,516
Cost: Net Installed Cost- Federal & State Incentive	\$246,461	N/A	N/A
Cost: Net Installed Cost (\$) -Utility Incentive	\$166,516	\$166,516	\$166,516
Cost: Net Installed Cost (\$) - Participant Customer	\$44,060	N/A	N/A
Cost: UTENs Revenue Requirement (\$)	\$46,403	\$46,403	\$46,403
Cost: Hydrogen Cost (\$)	\$206,051	\$206,051	\$206,051
Cost: RNG Production Cost (\$)	\$1,269,864	\$1,269,864	\$1,269,864
Cost: Lost Utility Revenue- Base Distribution	N/A	N/A	\$181,616
Cost: Lost Utility Revenue- Pipeline and Storage Fixed Costs	N/A	N/A	\$44,704
Cost: Increased Emissions, Societal Cost (\$)	\$2,494	N/A	N/A
Total Cost (\$)	\$3,122,474	\$1,941,605	\$2,167,925
Benefit/Cost Ratio	0.42	0.31	0.28

Table 3-11: RG&E BCA Results

Benefit Cost Analysis – NPV (\$) (Discount Rate 6.80%)	RG&E LTP SCT	RG&E LTP UCT	RG&E LTP RIM
Benefit: Avoided Gas Costs (\$)	\$(352,378)	\$(352,378)	\$(352,378)
Benefit: Avoided Gas System O&M and CapEx Rev Req (\$)	\$(4)	\$(4)	\$(4)
Benefit: Avoided Pipeline and Storage Fixed Costs (\$)	\$(15,994)	\$(15,994)	\$(15,994)
Benefit: Avoided Emissions, Societal Cost (\$)	\$(705,732)	N/A	N/A
Total Benefit (\$)	\$(1,074,108)	\$(368,376)	\$(368,376)
Cost: Incremental Electricity Cost (\$)	\$789,011	N/A	N/A
Cost: Weatherization Cost (\$)	\$315,911	\$233,201	\$233,201
Cost: Weatherization Cost - Federal & State Incentive	\$74,672	N/A	N/A
Cost: Weatherization Cost (\$) - Utility Incentive	\$233,201	\$233,201	\$233,201
Cost: Weatherization Cost (\$) - Participant Customer	\$8,038	N/A	N/A
Cost: Net Installed Cost (\$)	\$461,884	\$168,473	\$168,473
Cost: Net Installed Cost - Federal & State Incentive	\$308,935	N/A	N/A
Cost: Net Installed Cost (\$) -Utility Incentive	\$168,473	\$168,473	\$168,473
Cost: Net Installed Cost (\$) - Participant Customer	\$(15,523)	N/A	N/A
Cost: UTENs Revenue Requirement (\$)	\$52,837	\$52,837	\$52,837
Cost: Hydrogen Cost (\$)	\$213,931	\$213,931	\$213,931
Cost: RNG Production Cost (\$)	\$981,727	\$981,727	\$981,727
Cost: Lost Utility Revenue - Base Distribution	N/A	N/A	\$183,574
Cost: Lost Utility Revenue - Pipeline and Storage Fixed Costs	N/A	N/A	\$42,239
Cost: Increased Emissions, Societal Cost (\$)	\$3,172	N/A	N/A
Total Cost (\$)	\$2,818,472	\$1,650,168	\$1,875,981
Benefit/Cost Ratio	0.38	0.22	0.20

The Final LTP's Benefit/Cost Ratios are relatively in line with those of the Initial LTP. The Revised LTP had lower Benefit/Cost Ratios, primarily driven by reduced benefits in Avoided Gas Costs, despite reduced costs for weatherization and installation.

CRA inquired via data request as to the reason that the Avoided Gas Cost benefits are significantly reduced in the Revised and Final LTPs compared to the Initial LTP. The Companies' response to LTGP-23-196 specified that when calculating the Avoided Gas Cost benefits in the Initial LTP, they included both commodity and non-commodity gas costs. This methodology was altered in the Revised and Final LTPs, as the Avoided Gas Cost Benefits now only include avoided commodity costs.

LTGP-23-206 confirmed that the Companies now separate out avoided non-commodity gas costs when customers convert to the hybrid heating system in the LTP. LTGP-23-206 also confirmed that all scenarios, not just the LTP, are modeled this same way. Depending on the scenario, there are also non-commodity gas costs avoided (such as avoided meter and service costs) covered under other line items, namely "Avoided Gas System O&M and CapEx Revenue Requirement" and "Avoided Pipeline and Storage Fixed Costs."

3.14.4. Recommendations

Within 16-M-0411, the Companies have filed their most recent BCA Handbook from June 2023. This document covers four categories of utility expenditures on the electric side of their business.⁴²² The Companies have not developed a BCA Handbook specifically for evaluating natural gas investments. Within the NFG LTP Order, the Commission recommended that NFG develop a BCA Handbook.⁴²³

In its Preliminary Findings Report, CRA recommended the Companies develop a gas-specific BCA Handbook as well within a reasonable timeframe after the Final LTP. Learnings can be used from the NFG BCA Handbook Technical Conference as well

⁴²² NYSEG and RG&E, "Benefit Cost Analysis (BCA) Handbook Version 4.0". NY PSC Case 16-M-0411. June 30, 2023.

⁴²³ NFG LTP Order, 49.

as the Companies' existing BCA Handbook to develop a new gas-specific BCA Handbook.⁴²⁴ In its Final LTP, the Companies have indicated they will indeed develop a gas-specific BCA handbook and include it as an appendix to its next LTP filing.⁴²⁵

The benefit/cost ratios of 0.42 and 0.38 for NYSEG and RG&E, respectively, are the result of many assumptions and inputs the Companies used.

Factors such as the assumed gas and electric prices and the base rate forecast have a significant impact on the results of the BCA. CRA encourages stakeholders to review Tables D-44 through D-46 and D-89 through D-91 of the LTP's Appendix D, which details BCA results for both NYSEG and RG&E in all scenarios.

Regarding incentives, CRA encourages the Companies to treat federal incentives as a benefit, which would serve to improve the BCA results.

CRA calculated the benefit-cost ratio treating federal incentives as a benefit. For the purposes of this exercise, CRA assumed 75% of the incentives identified by the Companies as "Federal & State Incentives" to be federally funded (as the Companies have now broken out other incentives in the Utility Incentive section). The new BCRs with this updated BCA calculation methodology improved from 0.42 and 0.38 (for NYSEG and RG&E, respectively) to 0.50 and 0.48. This illustrates the potential impact of incentives on the BCA. Please see Table 3-12 below.

⁴²⁴ NFG's draft BCA Handbook can be found at <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7004D78D-0000-CD26-93BD-F52505AFF84B}>.

⁴²⁵ NYSEG and RG&E, *Final LTP*, 123.

Table 3-12: CRA Modified BCA Results

Benefit Cost Analysis - Societal Cost Test	NYSEG LT	RG&E LTP
	Discount Rate	Discount Rate
	6.58%	6.58%
	NPV (\$)	NPV (\$)
Benefit: Weatherization Cost (\$) - Federal Incentive	\$ (40,435,255)	\$ (56,003,677)
Benefit: Net Installed Cost (\$) - Federal Incentive	\$ (184,845,652)	\$ (231,701,168)
Benefit: Avoided Gas Commodity Costs (\$)	\$ (580,324,759)	\$ (352,377,640)
Benefit: Avoided Gas System O&M and CapEx Revenue Requirement (\$)	\$ (7,157)	\$ (3,679)
Benefit: Avoided Pipeline and Storage Fixed Costs (\$)	\$ (28,030,258)	\$ (15,994,413)
Benefit: Avoided Emissions, Societal Cost (\$)	\$ (717,262,627)	\$ (705,732,213)
Total Benefit (\$)	\$ (1,550,905,707)	\$ (1,361,812,790)
Cost: Incremental Electricity Cost (\$)	\$ 791,356,784	\$ 789,010,609
Cost: Weatherization Cost (\$)	\$ 349,268,674	\$ 315,910,730
Cost: Weatherization Cost (\$) - Federal & State Incentive	\$ 53,913,673	\$ 74,671,570
Cost: Weatherization Cost (\$) - Utility Incentive	\$ 252,770,835	\$ 233,200,743
Cost: Weatherization Cost (\$) - Non-Incentive	\$ 42,584,166	\$ 8,038,417
Cost: Net Installed Cost (\$)	\$ 457,036,625	\$ 461,884,136
Cost: Net Installed Cost (\$) - Federal & State Incentive	\$ 246,460,870	\$ 308,934,890
Cost: Net Installed Cost (\$) - Utility Incentive	\$ 166,516,062	\$ 168,472,630
Cost: Net Installed Cost (\$) - Non-Incentive	\$ 44,059,694	\$ (15,523,384)
Cost: UTENs Revenue Requirement (\$)	\$ 46,402,749	\$ 52,836,986
Cost: Hydrogen Cost (\$)	\$ 206,051,219	\$ 213,930,870
Cost: RNG Production Cost (\$)	\$ 1,269,863,679	\$ 981,727,231
Cost: Lost Utility Revenue (\$) - Base Distribution	N/A	N/A
Cost: Lost Utility Revenue (\$) - Pipeline and Storage Fixed Costs	N/A	N/A
Cost: Increased Emissions, Societal Cost (\$)	\$ 2,493,855	\$ 3,171,634
Total Cost(\$)	\$ 3,122,473,586	\$ 2,818,472,196
NYSEG Benefit/Cost Ratio	0.42	0.38
CRA Modified Benefit/Cost Ratio	0.50	0.48

The Companies should continue to conduct a BCA for individual NPA opportunities when replacing LPP. This should not only occur on new, currently unplanned investments, but also as part of its existing LPPR program to analyze NPA opportunities.

In the Preliminary Findings Report, CRA recommended the Companies perform not just the Societal Cost Test, but the Rate Impact Measure (RIM) and Utility Cost Tests (UCT). In the Final LTP, the Companies have “conducted and provided results of UCT and RIM for all scenarios and LTP.”⁴²⁶

⁴²⁶ NYSEG and RG&E, *Final LTP*, 78.

Regarding the Companies' revised BCA avoided gas cost calculation methodology, the Companies forecasted values (\$13M and \$11M on an NPV basis for NYSEG and RG&E, respectively) in the CLCPA Full scenarios for Avoided Gas System O&M and CapEx Revenue Requirement.

There were no Avoided Pipeline and Storage Fixed Costs in the Companies' full electrification scenarios or alternative hybrid heating scenarios, despite the Companies forecasting Avoided Pipeline and Storage Fixed Cost reductions in the LTP itself. CRA believes scenarios in which customers fully electrify should show a higher level of avoided pipeline and storage fixed cost reductions than in the LTP. This would improve the BCA for these full electrification scenarios.

CRA recommends the Companies reevaluate the level of modeled avoided non-commodity gas costs modeled in its two full electrification scenarios (CLCPA Full and Delayed Full), reflecting a material amount of both Avoided Gas System O&M and CapEx Revenue Requirement and Avoided Pipeline and Storage Fixed Costs.

Avoided costs could include the following:

- Meter and service costs
- Capital cost of replacing pipe (due to potential strategic decommissioning in areas of high electrification)
- Operating costs for maintaining existing pipes (due to either potential strategic decommissioning in areas of high electrification or reduced need for inspections or other routine maintenance no longer necessary due to reduced customer count).

3.15. Affordability and Impact on Customer Bills and Rates

3.15.1. Background

Maintaining affordability and minimizing the impact on customer bills is a key objective of the LTP. Affordability is emphasized in the Final Scoping Plan, and various stakeholders have stressed the importance of maintaining affordable rates in response

to the Gas Planning Order. As GHG reduction measures are implemented, the cost of providing gas service may increase. The key challenge will be to minimize the impact on customer bills while finding an optimal level of decarbonization. Special focus must be given to the impacts on disadvantaged communities and LMI customers.

3.15.2. Stakeholder & Company Feedback

AGREE encourages the Companies to engage in a “robust, detailed, and proactive NPA program to reduce customer costs and stranded costs” that will not be tempered if the Companies continue their planned investment in leak prone pipelines.⁴²⁷

Multiple Intervenors’ Comments on the Initial LTP urge the Commission to consider the costs of the Companies’ plan, stating the costs are excessive.⁴²⁸ They point out that, “[o]n an NPV basis, NYSEG proposes to spend \$4.095 billion and RG&E proposes to spend \$3.811 billion on the LTP,” noting that “any proposed utility expenditures recoverable from customers in the billions of dollars warrants the highest level of scrutiny by Department of Public Service Staff (“Staff”) and the Commission.”⁴²⁹ Multiple Intervenors further point out several initiatives which ratepayers are or will be paying for, and which could be financially crushing.⁴³⁰ With this framework, Multiple Intervenors ask the Commission to consider the big picture of all costs impacting customers when it considers the cost impact of the Companies LTP.⁴³¹ They also ask that the Commission consider how costs will be allocated as Industrial customers are unlikely to benefit from the LTP’s initiative but may be “forced to fund them.”⁴³²

SC/EJ point out that the Companies’ LTP includes plans and scenarios that are not consistent with CLCPA’s emissions reduction targets, and this dampens the

⁴²⁷ AGREE, *Comments on the Initial LTP*, 6.

⁴²⁸ Multiple Intervenors, *Comments on the Initial LTP*, 3.

⁴²⁹ *Ibid.*

⁴³⁰ *Id.*, 5 – 6.

⁴³¹ *Id.*, 11.

⁴³² *Id.*, 18.

presentation of the true cost of compliance in 20 years and creating a “challenging and expensive” compliance burden in the Companies’ next LTP process.⁴³³ NYSEG and RG&E’s LTP includes the assumption that capital expenditures will remain stable when carbon reduction targets should invoke strategies that include retiring segments of the distribution system.⁴³⁴

Likewise, Strategen states the Companies’ cost estimates are unreasonably high.⁴³⁵ Strategen points out that “[t]he Companies forecast \$4.1 billion in capital investments for each scenario during the LTP planning horizon, about \$200 million annually.”⁴³⁶ Further noting, “[i]t is not reasonable to assume that the delivery system will be the same in all scenarios given that two scenarios center on full electrification.”⁴³⁷ The Companies’ LTP should consider NPAs instead of continued pipeline maintenance and replacement.⁴³⁸

IBEW Local 10 and 36 raise concern that the pace of change in New York is too aggressive, as the transition away from natural gas “will reduce consumer fuel diversity and options, impact consumer price impacts, reduce system reliability and our ability to protect consumers during extreme events, and result in premature job loss of our membership while other emerging technologies that might employ our members are still in development stage.”⁴³⁹

3.15.3. Findings

One of NYSEG and RG&E’s guiding principles is energy affordability, and they stress that they will do their utmost to maintain reasonable rates while pursuing

⁴³³ SC/EJ, *Comments on the Initial LTP*, 14.

⁴³⁴ *Id.*, 17.

⁴³⁵ Strategen, *Comments on the Initial LTP*, 17.

⁴³⁶ *Id.*, 16.

⁴³⁷ *Ibid.*

⁴³⁸ *Id.*, 19.

⁴³⁹ IBEW Local 10 and Local 36, *Comments on the Initial LTP*, 2.

decarbonization initiatives. The Companies note that they will pay particular attention to the needs of LMI customers and disadvantaged communities. This will be especially necessary in the near-term economic climate. As noted by the Companies, five-year job growth has declined substantially across both NYSEG and RG&E service territories.⁴⁴⁰

The Companies' models show significant rate increases through 2043 for each case considered. For NYSEG, the LTP case projects typical residential nonparticipant monthly rates to increase by 173% in 2043 from 2024 levels (\$284 per month in 2043 vs \$104 per month in 2024). For RG&E, the LTP case also shows an increase of 166% (\$205 per month in 2043 vs \$77 per month in 2024).⁴⁴¹ Other cases for both Companies show varying levels of rate increases that correlate with emissions reduction efforts. For both NYSEG and RG&E, the CLCPA Full Electrification Case models the greatest level of emissions reduction. However, this case also projects the greatest cost increase over the 20-year period.⁴⁴²

The modeled rate increases over the next 20 years do not include the implementation of federal incentives for emerging technologies such as heat pumps for residential customers as benefits. Thus, the typical residential nonparticipant monthly rate increases reflect the cost to society rather than the out-of-pocket cost to the individual ratepayer, which may change based on other billing determinates, riders, or other mechanisms that impact the overall customer's bill.

3.15.4. Recommendations

Consistent with Section 3.15.4, in its Preliminary Findings Report, CRA recommended the Companies perform alternative cost tests (Utility Cost Test and Rate Impact Measure) to provide stakeholders with a better understanding of the LTP's

⁴⁴⁰ NYSEG and RG&E, *Revised LTP*, 23.

⁴⁴¹ NYSEG and RG&E, *Final LTP Appendix D*, D-20, D-67..

⁴⁴² NYSEG and RG&E, *Final LTP*, Appendix D.

performance from these other perspectives. The Companies have provided these alternative tests in their Final LTP.

As the LTP process continues, optimization improvements should be incorporated into the scenario modeling. Special notice should be taken to ensure that LMI customers and disadvantaged communities are not disproportionately affected as rates increase.

The Companies should consider showing the potential impacts of federal incentives on total customer costs in each of the scenarios. New York state and federal funding make residential weatherization and heat pump installation significantly cheaper through rebates and tax credits. Including this in scenario modeling will give a more accurate picture of customer rates for each decarbonization scenario.

3.16. Disadvantaged Communities

3.16.1. Background

In response to the Gas Planning Order, many stakeholders at the time opined that the impact of the gas utility LTPs on disadvantaged communities must be considered.⁴⁴³ The Commission also encouraged utilities to create special programs for LMI customers or disadvantaged communities.⁴⁴⁴

Stakeholders stressed the importance of planning with disadvantaged communities in mind, as low-income communities may be disproportionately hurt by an unmanaged downsizing of the natural gas system. As customers potentially leave the gas system over time, the remaining customers who are unable to afford to leave the system may be burdened with increasing bills. Additionally, the impact of air pollution may disproportionately affect disadvantaged communities of color and/or low-income populations.⁴⁴⁵

⁴⁴³ NY PSC, *Gas Planning Order*, 16 – 17.

⁴⁴⁴ *Id.*, 39.

⁴⁴⁵ *Id.*, 39 – 40.

In the Gas Planning Order, the Commission validates the importance of stakeholder comments related to disadvantaged communities. The Order requires that utilities “identify the disadvantaged communities in their service territories, explain the impacts to disadvantaged communities of any proposed projects, and explain how the LDC will ensure that an appropriate portion of the benefits of any proposed NPAs such as energy efficiency, demand response, and electrification accrue to disadvantaged communities.”⁴⁴⁶

Section 3.12.1 outlines the requirements of the CLCPA regarding disadvantaged communities. Through the Gas Planning Order and this proceeding, the Commission must ensure that their decisions do not run counter to the goals of the CLCPA.⁴⁴⁷

New York State’s EE proceeding (Case 18-M-0084) began in 2018 following the Governor’s direction to the NY DPS and NYSERDA to convene and propose comprehensive EE targets and policy. The “New Efficiency: New York” report was released in April 2018, and the NY PSC Order was subsequently released in December 2018.⁴⁴⁸ The “CLCPA – Disadvantaged Communities Investment and Benefits Reporting Guidance” provides guidance on New York electric and gas utility tracking and reporting associated with disadvantaged communities in relation to the CLCPA. As stated in the guidance document, this was originally required by the NY PSC 2021 CEF Modifications Order.⁴⁴⁹

3.16.2. Stakeholder & Company Feedback

The Companies’ LTP relies heavily on RNG and Hydrogen. AGREE points out that RNG or any source of methane, when used for cooking, may lead to childhood asthma, and further, “when combusted, pure hydrogen produces as much as six times the Nox as burning methane, raising the concern that blending hydrogen gas may make

⁴⁴⁶ *Id.*, 40.

⁴⁴⁷ *Id.*, 57.

⁴⁴⁸ NY PSC, “*Order Adopting Accelerated Energy Efficiency Targets*,” 2. Case 18-M-0084. December 13, 2018.

⁴⁴⁹ NY PSC Office of Markets & Innovation, *CLCPA – Disadvantaged Communities Investment and Benefits Reporting Guidance*, Case 18-M-0084, September 27, 2023.

cooking with a gas stove even more unhealthy.”⁴⁵⁰ AGREE is concerned that the Companies’ reliance on meeting carbon goals through RNG and Hydrogen may have the unintended consequences of transferring health risks to disadvantaged communities who cannot afford to leave the gas system. AGREE points out that LTPs “must ensure that additional financial burden not placed on disadvantaged communities, either through up-front appliance costs or increased gas prices.”⁴⁵¹ More work must be done to ensure that carbon mitigation does not harm disadvantaged communities.

While Multiple Intervenors do not directly speak to the concerns of disadvantaged communities, their comments do point out that the overall costs of the Companies LTP are excessive and that the BCAs are not cost effective; both concerns would likely disproportionately impact disadvantaged communities.⁴⁵²

SC/EJ point out that NYSEG and RG&E fail to consider a managed approach to transitioning customers off the gas system. Failure to plan results in unduly burdening low-income customers with stranded costs. SC/EJ says, “By contrast, a managed transition that moves away from pipeline gas in phases through targeted pruning—and frontloads investments in low- to moderate-income households and disadvantaged communities—will avoid ballooning costs and minimize burdens to ratepayers.”⁴⁵³

SC/EJ point out NYSEG and RG&E’s reliance on hydrogen and RNG does not address the health risk associated with fuel combustion and this public health concern is most likely to impact disadvantaged communities.⁴⁵⁴ SC/EJ say,

Indoor fuel combustion in New York poses grave public health threats, In2017, an estimated 19840 premature deaths were caused by pollution from fuel combustion in buildings in New York, more than in any other state. Because RNG is primarily methane, its combustion will produce the same local pollutants as

⁴⁵⁰ AGREE, *Comments on the Initial LTP*, 6 – 7.

⁴⁵¹ *Id.*, 7.

⁴⁵² Multiple Intervenors, *Comments on the Initial LTP*, 3, 17-19.

⁴⁵³ Sierra Club/Earthjustice, *Comments on the Initial LTP*, 18.

⁴⁵⁴ *Id.*, 24.

*conventional fossil gas. These alternative fuels, when combusted therefore produce dangerous indoor levels of nitrogen oxides ('Nox'), which cause and exacerbate asthma and impair lung function; particulate matter, which can lead to premature death; carbon monoxide, which inhibits cellular respiration; and carcinogens including formaldehyde and benzene. Nor will blending any of these fuels with hydrogen make them safe. Hydrogen combustion produces up to six times as much Nox as methane combustion and can therefore pose an even greater threat to human health.*⁴⁵⁵

SC/EJ goes on to say that these health issues are most experienced by low-income communities and communities of color as they tend to be economically trapped in poor housing conditions.⁴⁵⁶ Overall, SC/EJ believes the Companies' plan fails to comprehensively identify disadvantaged communities in their service territory and consider the plan's impacts to disadvantaged communities.⁴⁵⁷

Strategen states that the Companies fail disadvantaged communities by only considering boiler conversions in their full electrification scenario. Strategen theorizes that lower-income customers are more likely to live in older homes with boilers and that failing to electrify them will inequitably burden disadvantaged communities with higher costs.⁴⁵⁸

The Companies reiterate their policies and programs from the Initial LTP intended to deliver benefits to LMI customers and disadvantaged communities. "These included explicit consideration of DACs when considering NPAs and prioritizing capital investments and subjecting potential vendors to sustainability standards by applying ESG scoring."⁴⁵⁹ The Companies agree with several CRA and Stakeholder recommendations that more specifically would improve the LTP and consideration of disadvantaged communities. The Companies mentioned that they would summarize and discuss disadvantaged community tracking data and share it in the Revised LTP,

⁴⁵⁵ *Id.*, 39.

⁴⁵⁶ *Id.*, 40.

⁴⁵⁷ *Id.*, 44.

⁴⁵⁸ Strategen, *Comments on the Initial LTP*, 8 – 9.

⁴⁵⁹ NYSEG and RG&E, *Reply Comments on the Initial LTP*, 21.

and did so. They also included listings of existing and future planned projects that are in or will potentially have impacts on disadvantaged communities. This was included in the Final LTP as well.

The Companies respond that they will consider other stakeholder recommendations, one of which is collaboration with People United for Sustainable Housing (“PUSH”). They also address the stakeholder suggestion that disadvantaged communities receive at least 35% of NYSEG and RG&E’s investment in NPAs. They state that the 35% requirement is applicable to state policies and programs, rather than specific utilities. The “Companies are focused on ensuring benefits to customers in DACs, they do not believe a utility-specific quantifiable binding commitment is necessary or productive.”⁴⁶⁰

In their comments on the Revised LTP, SC/EJ assert that “the LTP fails to ensure that disadvantaged communities (“DACs”) will not be disproportionately burdened and fails to funnel at least 35% of the benefits of energy efficiency and clean energy funding to disadvantaged communities as required by the Gas Planning Order and the CLCPA.” They state that although the Revised LTP provides more details on the Companies’ spending and data collection in disadvantaged communities, the Revised LTP does not adequately provide information on how the Companies will ensure disadvantaged communities receive at least 35% of the benefits of NPAs. SC/EJ also express concern about the Companies’ proposed energy efficiency program’s weatherization incentives to single-family homeowners, stating that limiting eligibility to homeowners may risk excluding members of disadvantaged communities. Additionally, SC/EJ points out that the Revised LTP does not show how disadvantaged communities will receive 35% of the Energy Efficiency and Building Electrification program. Lastly, they bring up the concern that disadvantaged communities will potentially be disproportionately dependent on the gas system.⁴⁶¹

⁴⁶⁰ NYSEG and RG&E, Reply Comments on the Initial LTP, 23.

⁴⁶¹ Sierra Club and Earthjustice, *Comments on the Revised LTP*, 14-16.

3.16.3. Findings

The Companies do identify the disadvantaged communities in their service territory in the LTP.⁴⁶² Additionally, the Avangrid companies are developing an enterprise-wide framework for addressing disadvantaged communities and LMI customers, and the LTP outlines various programs that consider disadvantaged communities.

However, the LTP lacks the specific discussion and quantification of benefits to disadvantaged communities to comply with the Gas Planning Order.

3.16.4. Recommendations

The Companies provided further discussion of the projects and programs that will be geared toward disadvantaged communities in their LTP.⁴⁶³ This is helpful and encouraging; however, there is still no specific total spend or benefit quantification for disadvantaged communities to evaluate the level of spend the Companies are directing toward disadvantaged communities.

Accordingly, CRA recommends the Companies quantify total benefits to disadvantaged communities and compare it to the total plan benefits.

3.17. Stakeholder-Driven Alternative Scenarios

3.17.1. Background

In the Gas Planning Order's discussion of the role of the independent consultant, the Commission stated the expectation that "the consultant will participate in stakeholder meetings and be able to make requests of the LDC and stakeholders participating in the long-term planning process" to "ensure that the consultant, Staff, and the Commission have a complete understanding of any proposals."⁴⁶⁴

Throughout the NYSEG/RG&E LTP process and through comments summarized in this report, stakeholders made it clear that they disagree with certain elements of the

⁴⁶² NYSEG and RG&E, *Final LTP*, 15-16.

⁴⁶³ NYSEG and RG&E, *Final LTP*, 15 – 18.

⁴⁶⁴ NY PSC, *Gas Planning Order*, 26 – 27.

LTP. CRA also has made numerous recommendations in its Initial Findings Report and will refine/finalize these recommendations in this report and its Final Report. For these reasons, CRA believes all stakeholders, Staff, and the Commission need to understand how the LTP would differ if changes in the Companies' assumptions were made. CRA recommended new scenarios for the Companies to run in order to capture potential alternative pathways forward.

On January 19, 2024, CRA distributed its initial suggested scenarios, noting that stakeholders would have the opportunity to provide feedback. This feedback is summarized in Section 3.17.2.

On January 30, 2024, after further research, internal discussion, and stakeholder feedback, CRA finalized and distributed four suggested scenarios.

After CRA's review of the four scenario results, CRA suggested two additional scenarios via a data request on March 19, 2024.

3.17.2. Scenario Assumptions & Definitions

Global assumptions to be used in all six of the CRA stakeholder-driven scenarios were as follows:

- Model a 1% annual nominal reduction in heat pump cost, which aligns with the projected cost curve from the NREL Electrification Futures study's Moderate Advancement scenario.⁴⁶⁵
- Assume zero carbon capture and sequestration for the industrial segment.
- Remove any maximum participation rate used for all customer segments. The resulting GHG emissions reduction will be calculated for these scenarios and may exceed or fall short of 65%, as determined by the model.

⁴⁶⁵ NREL, "Electrification Futures Study: Scenarios of Power System Evolution and Infrastructure Development for the United States"; Available from <https://www.nrel.gov/docs/fy21osti/72330.pdf>.

- The prohibition on fossil fuels will be modeled for all new buildings seven stories or smaller using electrification starting in 2026, except for commercial and industrial buildings larger than 100,000 square feet. Starting in 2029, all new buildings should be modeled with electric heating, per the legislation passed in May 2023.
- Remove all hydrogen and RNG system-wide blending.
 - CRA acknowledges these supply-side alternatives may be used in a targeted fashion for difficult-to-electrify industrial customer applications. However, this use for RNG and hydrogen is outside the scope of the specific scenarios CRA is recommending at this time.
- All six scenarios should use the same weatherization (including for industrials) and UTENs assumptions as the LTP.
- No incremental costs (relative to reference case) for electrification should be added for new construction for any customer that is prohibited from installing fossil fuel equipment per New York State legislation passed in May 2023.
 - Accordingly, the Reference Case for these three scenarios should remove all new residential and commercial gas customer growth related to new construction starting in 2026 (and therefore no costs or benefits associated with electrifying new construction should be included in the modeling).
- Starting in 2028, assume that 0.5% of existing customer conversions of furnace systems and 0.5% of new customers adopt ground-source heat pumps for residential and commercial market segments, each increasing 0.5% annually through 2043.
 - Average capital cost of \$30,000 before incentives.

- Model a 45% reduction in annual energy usage compared to customers that use a ccASHP.⁴⁶⁶
- The electrification of boilers should be assumed to occur using the same adoption rates as furnaces in all scenarios.
- A BCA should be calculated for each of the new scenarios using each of the SCT, Rate Impact Measure, and Utility Cost Tests.

When modeling incentives in CRA's stakeholder-driven scenarios 2 - 6, the following incentives should be included:

- Model the point-of-sale rebates for LMI customers from the High Efficiency Electric Home Rebate Act ("HEEHRA") for both electrification and weatherization. These rebates should be modeled beginning in 2024.
 - The HEEHRA rebate covers 100% of the costs to electrify and weatherize homes in low-income households and 50% of the costs for moderate-income households up to \$14,000. Heat pump unit rebates max out at \$8,000 with additional rebates for wiring, circuit breaker panel work, etc., for the max total rebate of \$14,000.⁴⁶⁷
- Non-LMI customers are eligible for a 30% federal tax credit up to \$2,000 for heat pumps and \$1,200 for weatherization via the 2022 IRA.⁴⁶⁸

⁴⁶⁶ Geothermal heat pump assumptions were developed using CRA research and stakeholder input from the New York Geothermal Energy Organization, also known as NY-GEO. NY-GEO provided a document detailing certain assumptions that was filed in the 23-G-0437 docket as a Public Comment on February 4, 2024.

⁴⁶⁷ AC Direct, *HEEHRA Rebates 2024-2025: Get up to \$14,000 in government funds for upgrading the energy efficiency of your homes' central air and appliances.*; Available from <https://www.acdirect.com/heehra-rebate-program-heat-pump#:~:text=The%20HEEHRA%20rebate%20bill%20was,households%20for%20up%20to%20%2414%2C000>.

⁴⁶⁸ U.S. Department of Energy Office of Policy, *Making Our Homes More Efficient: Clean Energy Tax Credits for Consumers*; Available from <https://www.energy.gov/policy/articles/making-our-homes-more-efficient-clean-energy-tax-credits-consumers>.

- Geothermal heat pump system tax credits are also available.
 - Utility point-of-sale rebate through the New York State Clean Heat program: For this specific heat pump sizing, the point-of-sale rebate would be \$5,400 per geothermal system.
 - 2022 Inflation Reduction Act for ten years beginning in 2023: 30% tax credit for residential customers and 40% for commercial customers through 2032 (assumes 10% bonus tax credit provision for commercial customers).⁴⁶⁹
 - 25% New York State tax credit up to \$5,000 for residential customers.⁴⁷⁰
- For the purposes of these scenarios, please assume these tax credits continue at these levels through 2043. CRA recognizes that under current federal policy, tax credits begin to sunset in 2032, but continued incentives will likely be necessary to support continued adoption of these technologies.
- Assume tax credits and rebates are available for all eligible customers. In other words, these programs have no budgetary constraints.

Scenario definitions are as follows:

Scenario #1. Base LTP scenario but utilizes full electrification for customers with furnaces using ccASHPs (electric backup) and assume hybrid systems using conventional ASHPs for customers with boilers:

- Use the same adoption rate that the Companies currently assume for their Initial LTP.

⁴⁶⁹ U.S. Department of Energy Geothermal Technologies Office, *Geothermal Heat Pump Information for Consumers*; Available from <https://www.energy.gov/eere/geothermal/geothermal-heat-pump-information-consumers>.

⁴⁷⁰ New York State, *NYS Clean Heat Rebates*; Available from <https://cleanheat.ny.gov/find-available-rebates/?>.

- Assume that customers with furnaces adopt ccASHPs for the residential, commercial, municipal, and industrial market segments.
- Assume that customers with boilers convert to ASHP systems using mini-split air source heat pumps for residential, commercial, municipal segments assuming same adoption rate as gas furnace conversions.
- Reduction in pipeline and storage capacity fixed costs, decreasing by 0.5% each year starting in 2028 through 2043. Additionally, please be sure to remove the pipeline and storage capacity cost premiums that were added for hydrogen/RNG.

Scenario #2. Hybrid Heating Scenario utilizing ccASHPs for furnaces for all segments and ASHPs for boilers. Also, include the following assumptions:

- Use the same adoption rate that the Companies currently assume for their Initial LTP.
- Include incentives as a customer benefit for weatherization and heat pumps (ccASHPs, air-source heat pumps, and geothermal heat pumps).
- Reduce pipeline and storage capacity fixed costs, decreasing by 0.5% each year starting in 2028 through 2043. Additionally, remove the pipeline and storage capacity cost premiums that were added for hydrogen/RNG.

Scenario #3. Full Electrification Scenario utilizing ccASHPs for all segments (furnaces and boilers):

- Use the same adoption rate that the Companies currently assume for their Initial LTP.
- Include incentives as a customer benefit for weatherization and heat pumps (ccASHPs, air-source heat pumps, and geothermal heat pumps).
- Use a 1.0% reduction in pipeline and storage capacity fixed costs, decreasing an additional 1.0% each year starting in 2028 through 2043. Additionally, remove the pipeline and storage capacity cost premiums that were added for hydrogen/RNG.

- Introduce strategic downsizing for the natural gas system, using the steps below as a proxy for downsizing.
 - Use a 1.0% reduction in O&M costs, decreasing an additional 1.0% each year starting in 2028 through 2043 due to strategic downsizing of the system.
 - Use a 1.0% reduction in CapEx spend, decreasing an additional 1.0% each year starting in 2028 through 2043 due to fewer infrastructure needs.

Scenario #4. Full Electrification Scenario utilizing ccASHPs for all segments (furnaces and boilers):

- Use the same adoption rate as the NYSEG/RG&E Initial LTP's "CLCPA Full Electrification Scenario" (this is the only scenario that has a different adoption rate; the first three use the same adoption rate from the Initial LTP).
- Include incentives as a customer benefit for weatherization and heat pumps (ccASHPs, air-source heat pumps, and geothermal heat pumps).
- Utilize reduced up-front costs for ccASHP system as shown in Table 11 (page 35) of Strategen's Comments on the NYSEG/RG&E Initial LTP. (This is the only scenario that utilizes different up-front costs; the first three use the same up-front costs as the Initial LTP's Full Electrification scenarios).
- Use a 3.0% reduction in pipeline and storage capacity fixed costs, decreasing an additional 3.0% each year starting in 2028 through 2043. Additionally, remove the pipeline and storage capacity cost premiums that were added for hydrogen/RNG.
- Introduce strategic downsizing for the natural gas system, using the steps below as a proxy for downsizing.
 - Use a 3.0% reduction in O&M costs, decreasing an additional 3.0% each year starting in 2028 through 2043 due to strategic downsizing of the system.

- Use a 3.0% reduction in CapEx spend, decreasing an additional 3.0% each year starting in 2028 through 2043 due to fewer infrastructure needs.

Scenario #5. Scenario 5 uses all the same assumptions as CRA/Stakeholder-Driven Scenario 4, except:

- Assume that all customers' weatherization occurs prior to electrification, allowing for reduced electric usage and heat pump size
 - Due to this change, assume that 50% of electrifying customers install a 3-ton heat pump (rather than the 3.5-ton heat pump modeled by the Companies in CRA Scenario 4) at a capital cost of \$1,000 less than the 3.5-ton heat pump.
- In addition to the reductions in CapEx, operating expenses, and fixed pipeline & storage costs, Scenario 5 assumes an equal reduction in actual mileage of distribution pipe in the natural gas system, therefore resulting in equivalent emissions reduction due to the calculation of emissions being based on mileage of pipe.
- Scenario 5 models cold-climate ASHP COP improvement over time, consistent with the 2030 and 2040 COP values provided in slide 17 of NYSERDA's "Modeling Managed Building Electrification in New York State" presentation from October 18, 2023. These values are used in NYSERDA's Integration Analysis, which derives ASHP annual COP improvement from NREL's 2021 Electrification Futures Study "Moderate Advancement" scenario.

Scenario #6. Use all the same assumptions as Scenario 5 above, except adjust adoption rates such that the emissions reduction is on pace to meet the 2050 CLCPA goal of 85% below 1990 levels, similar to the Companies' existing CLCPA scenarios.

These scenarios are summarized in the following table from the Companies' Final LTP:

Table 3-13. CRA/Stakeholder Scenario Specifications from Final LTP

Action	CRA #1 Electrification Only- Mix	CRA #2 Electrification Only- Hybrid	CRA #3 Electrification Only- Full-1% Downsizing	CRA #4 Electrification Only-Full-3% Downsizing	CRA #5 Electrification Only-Full-3% Downsizing Pre-Weather	CRA #6 Electrification Only- Full-3% Downsizing Pre- Weather CLCPA
Weatherization	• Residential: 1% of homes/year in 2027, incremental participation growing by 0.25%/year				• Residential: All weatherize prior to electrification. Participation is greater of electrification or 1% of homes/year in 2027 with incremental participation growing by 0.25%/year	
	• Commercial: 0.5% heat load reduction/year • Municipal: 1% heat load reduction/year					
Electrification	• Furnaces: 0.5% of residential, commercial, and municipal furnace conversions adopt GSHP in 2028, growing by 0.5%/year:					
	• Furnaces: ccASHP w elec resistance • Boilers: mini-splits w gas boiler • Ramp Rate: • Res: 5.4%/yr • Com: 2.1%/yr • Muni: 3.6%/yr	• Furnaces: ccASHP w gas furnace • Boilers: mini-splits w gas boiler • Ramp Rate: • Res: 5.4%/yr • Com: 2.1%/yr • Muni: 3.6%/yr	• Furnaces: ccASHP w elec resistance • Boilers: full elec w mini-splits • Ramp Rate: • Res: 5.4%/yr • Com: 2.1%/yr • Muni: 3.6%/yr	• Furnaces: ccASHP w elec resistance • Boilers: full elec w mini-splits • Pace: same as CLCPA Full	• Furnaces: ccASHP w elec resistance • Boilers: full elec w mini-splits • Pace: to hit target GHG emissions reductions	
Industrial Customer Programs	• Energy Efficiency of Process Load: 0.5% process load reduction/year					
	• Electrify Space Heating: furnace/heater conversions to ccASHP and boiler conversions to mini-splits w gas boiler ramping up at 2.1%/yr	• Electrify Space Heating: furnace/heater conversions to ccASHP w gas furnace and boiler conversions to mini-splits w gas boiler ramping up at 2.1%/yr	• Electrify Space Heating: furnace/heater and boiler conversions to ccASHP ramping up at 2.1%/yr	• Electrify Space Heating: furnace/heater and boiler conversions to ccASHP at CLCPA Full pace		• Electrify Space Heating: furnace/heater and boiler conversions to ccASHP at pace to hit target GHG emission reductions
	• Carbon Capture: none					
UTENs	• 2035 start, one project of 24 residential and 8 non-residential buildings every other year					
RNG	• none					
Hydrogen	• none					
CRA/STAKEHOLDER SCENARIO-SPECIFIC ASSUMPTIONS (i.e., differences from assumptions in the Companies’ scenarios)						
Heat Pump Cost & Efficiency Improvements	Reduce heat pump costs 1%/yr nominal					
				• Reduce ccASHP start cost to \$15,378 (2023\$)		
					• 50% of residential customers downsize ccASHP from 3.5 ton to 3-ton with cost reduction of \$1000. • ASHP efficiency improves 3%/yr through 2030 and 1%/yr thereafter for residential and 2%/year through 2030 for commercial.	
Pipeline & Storage Fixed Costs	• Reduce by 0.5%/yr starting in 2028		• Reduce by 1%/yr starting in 2028	• Reduce by 3%/yr starting in 2028		
O&M and CapEx			• Reduce by 1%/yr starting in 2028	• Reduce by 3%/yr starting in 2028		
Distribution System Emissions					• Reflect 3%/yr reduction in miles of gas distribution pipe starting in 2028	

3.17.3. Stakeholder Feedback

NY-GEO provided considerable input related to geothermal heat pump usage and cost information. The document that NY-GEO provided can be found in the 23-G-0437 docket as a Public Comment on February 4, 2024.

SC/EJ provided written comments on the additional scenarios. They were generally supportive of various aspects of the scenarios, such as the removal of hydrogen and RNG system-wide blends and removing the max participation rate for heat pump adoption. They also recommended more aggressive O&M and CapEx reductions in Scenario 3.

As these scenarios are meant to be driven by stakeholders, CRA adjusted accordingly, adding a fourth scenario with much higher levels of O&M and CapEx reductions.

3.17.4. Findings

The Companies included the scenario results in their LTP. Emissions reductions were not as high as the LTP scenario due to removing the assumptions of hydrogen and RNG system-wide blends, as well as removing Carbon Capture and Storage.⁴⁷¹ CRA's suggested stakeholder-driven alternative scenarios did not solve for a specific emissions reduction target. Rather, the emissions reduction levels were an output based on a variety of adjusted input assumptions. Emissions reduction results for the CRA/Stakeholder driven scenarios are shown below.

Table 3-14: Results Matrix Including Stakeholder-Driven Alternative Scenarios⁴⁷²

Scenario	2030 GHG Emissions Reduction (% below 1990)	2043 GHG Emissions Reduction (% below 1990)	2043 Affordability (Typical residential gas bill - \$/mo.)
NYSEG			

⁴⁷¹ NYSEG and RG&E, *Final LTP*, 91 – 92.

⁴⁷² NYSEG and RG&E, Response to LTGP-23-215, Attachment 1.

CRA-1	-15%	-46%	\$378
CRA-2	-14%	-42%	\$319
CRA-3	-15%	-48%	\$394
CRA-4	-15%	-46%	\$310
CRA-5	-15%	-43%	\$272
CRA-6	-23%	-65%	\$826
RG&E			
CRA-1	-16%	-45%	\$247
CRA-2	-15%	-42%	\$222
CRA-3	-16%	-47%	\$248
CRA-4	-16%	-52%	\$249
CRA-5	-16%	-46%	\$213
CRA-6	-25%	-65%	\$387

3.17.5. Recommendations

CRA encourages stakeholders to evaluate the results of the CRA/Stakeholder-driven scenarios and provide comments.

4. Conclusion

The Companies' LTP provides a good basis for beginning the process of developing a plan that will meet the objectives of the Gas Planning Order and the CLCPA. The Companies have presented a range of scenarios that provide an opportunity for stakeholder input and further investigation to guide the development of the LTP. The additional scenarios requested by CRA and stakeholders are beneficial in helping to understand further the impact of variations in other key assumptions including electric price forecasts, gas prices, future heat pump installed costs and performance, and the potential for downsizing the gas network.

The Final LTP provides a discussion of the LTP methodology, and the appendix material details many of the assumptions. The Companies added detail regarding what near-term actions will be required to achieve the LTP objectives to the "Conclusions and Implementation Actions" chapter. This chapter of the Final LTP provides a summary of numerous activities, divided into nine categories that are designed to develop the capabilities and to implement the decarbonization actions included in the LTP. These include some near-term actions, but they point out that the success and timelines are dependent on regulatory approvals. These categories are as follows:

1. Weatherization
2. Electrification
3. Industrial Customer Programs,
4. Utility Thermal Energy Networks
5. RNG
6. Hydrogen
7. NPAs
8. DACs
9. Other Activities

The weatherization, electrification, and industrial customer programs have a similar series of actions listed that follow a general sequence of activities, starting with program design. This is followed by performing studies to understand the issues related to incentives, customer adoption, impacts on DACs, market segmentation (landlords/tenants), and relationships to other programs such as those implemented by NYSERDA. This step is followed by proposing a program for regulatory approval, generally targeting 2027 as the time of implementation. Implementation will include customer education, outreach, and promotion of the program. Data will be collected as the Companies begin to understand issues related to participation, cost, gas saving, and DAC participation. This data can then be used to inform future LTPs and continue to evolve the various programs. Annual updates on the progress of these activities should be provided in future LTPs.

The UTENs actions focus on design, regulatory approval, construction, learning, and continuing to provide updates. This will all inform future LTP filings. The RNG actions will include proposing a procurement program, obtaining regulatory approval, and implementing an RNG program by 2026. This will also include working with industrial customers to understand their interest in participating.

Hydrogen actions include following and sponsoring research to better understand the issues related to blending, then proposing a program for regulatory approval and implementation by 2028. The Companies also plan to work with their industrial customers to see how they might use hydrogen directly as a decarbonization option. This experience will be used to inform future LTPs.

The Companies will continue to screen all main-related capital projects to assess applicability for NPAs and provide quarterly updates and reports in future LTP filings. The stated objective is to have a robust and diverse portfolio of NPA projects that will grow over time as they continue to seek potential NPAs that will support targeted retirement of segments of the distribution system. They discuss looking for innovative solutions and consider factors other than cost-effectiveness when evaluating NPAs that are located within a DAC, including income levels in the targeted areas.

Related to DACs, the Companies discuss developing an enterprise-wide “Just Transition” framework that will be applied across the entire corporation. This will include the utility, other lines of business for the Companies, and their business outside NY. The Companies state that other activities in support of DACs will include developing processes to track progress and performance toward achieving DAC requirements, developing policies and practices in support of community engagement with DACs, developing supplemental programs, and supporting workforce development.

CRA recommends additional details on progress on these initiatives be included in annual updates and future LTPs.

The final category of actions captures several other areas that the Companies will address related to their LTP program. These actions include the development of a BCA handbook, which will be included in their next LTP filing. CRA recommends the development of this handbook take place sooner in order to support their evaluation of NPAs, energy efficiency, electrification programs, and other initiatives that should use this approach for evaluation and support of their investments. They discuss continuing to evaluate vulnerabilities, and reporting on these issues in future LTPs, monitoring the Cap-and-Invest program, and monitoring adoption of decarbonization technologies, which will be reported on in their LTP filings. The Companies will also continue to distribute Residential Methane Detection devices to low-income customers and provide related outreach and educational support services.

The companies discuss continuing to execute available capacity release transactions (including asset management agreements) to reduce costs for customers and to evaluate gas supply and capacity portfolio opportunities. This is an important area and opportunity for reducing costs and CRA recommends that the Companies also develop a forecast for these opportunities that can be included in future LTP updates.

The “Conclusions and Implementation Actions” chapter includes many of the recommendations made by CRA and stakeholders during the LTP development process. While there are not detailed schedules discussed for the actions, they have set future timeframes for implementation based on their rate case schedules or other

proceedings. These activities will need to be developed in much more detail in the coming year and should be described in their annual LTP updates and the next LTP.

In this report, CRA has made recommendations in several areas that could improve the LTP. They are a result of CRA research and investigation and substantial stakeholder feedback. Stakeholders have been a key part of the LTP process and CRA appreciates the New York PSC's acknowledgement that the gas planning process is best done in a collaborative way, allowing all stakeholders to be heard. Adopting the recommendations developed throughout this Preliminary Findings Report would provide important information that stakeholders will need to better understand the LTP and would help to ensure the assumptions that make up the LTP are reasonable, allowing for an affordable and equitable plan that meets the climate goals of New York State.