

# Final Gas Long-Term Plan

## Executive Summary

New York State Electric & Gas  
and Rochester Gas and Electric

Case 23-G-0437

April 26, 2024

# Executive Summary

New York State Electric & Gas Corporation (“NYSEG”) and Rochester Gas and Electric Corporation (“RG&E”) (collectively, the “Companies”) present this Final Gas Long-Term Plan (“LTP”) in accordance with the New York Public Service Commission’s (“Commission” or “PSC”) May 12, 2022 *Order Adopting Gas System Planning Process* (“Gas Planning Order”).<sup>1</sup> The Gas Planning Order establishes a gas system planning process for natural gas local distribution companies (“LDCs”) in New York and includes, among other things, a requirement for each LDC to file a long-term plan. The Companies filed their Initial LTP on October 2, 2023 and their Revised LTP on February 16, 2024. The Final LTP reflects input provided by Staff’s Independent Consultant, Charles River Associates (“CRA”), and feedback provided by Stakeholders in filed comments and during technical sessions. The LTP represents the Companies’ commitment to provide safe, reliable, and affordable energy service that delivers sustainable reductions in greenhouse gas (“GHG”) emissions while preserving customer choice to its almost 600,000 natural gas customers.<sup>2</sup>

While the LTP focuses primarily on the Companies’ gas business, it considers the role served by its electric distribution businesses to accommodate growth in electricity usage from the conversion of heating and other end-uses from natural gas (and other fuels) to electricity. NYSEG and RG&E’s gas LTP and supporting analyses reflect data and assumptions regarding current technology and costs, enabling the Companies to present a realistic, achievable plan that considers the on-the-ground realities and forecast uncertainties that will ultimately determine the timing and cost of meeting the State’s GHG emissions reduction targets. These real-world challenges, many of which are outside of the control of utilities, regulators, and legislators, will impact the execution of the Companies’ LTP as well as the timing and cost of the statewide decarbonization effort.

## Avangrid’s Commitments to Reducing GHG Emissions

Avangrid, Inc., (“Avangrid”), NYSEG and RG&E’s corporate parent, has GHG emission reduction goals that align with New York’s Climate Leadership and Community Protection Act (“CLCPA”). More specifically, Avangrid has established a goal of achieving carbon neutrality in Scopes 1 and 2 emissions by 2030. This aggressive goal is consistent with Avangrid’s network platform to connect renewable energy to over 3 million customers in the Northeast, as well as Avangrid’s position as the 3<sup>rd</sup> largest wind operator in the US. Achieving Avangrid’s carbon neutrality goal will require significant actions by every Avangrid business unit including its utility subsidiaries. Recognizing this need, the Avangrid Board of Directors adopted a Climate Action Policy and a Sustainability Development Policy in February 2023. The Climate Action Policy sets forth the following corporate commitment:

AVANGRID seeks to contribute actively and decisively to a low- carbon and sustainable future, delivering clean, low emission energy, minimizing the environmental impact of our activities and supporting and promoting actions that address climate change. Such efforts must be compatible with social and economic growth.<sup>3</sup>

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<sup>1</sup> *Order Adopting Gas System Planning Process (“Gas Planning Order”) issued on May 12, 2022, in Case No. 20-G-0131.*

<sup>2</sup> *NYSEG serves approximately 272,000 natural gas customers in 30 counties; RG&E serves approximately 323,000 natural gas companies in 7 counties.*

<sup>3</sup> *Avangrid Climate Action Policy, February 16, 2023, p. 1.*

Avangrid’s Sustainability Development Policy establishes specific objectives that contribute to sustainable outcomes across the businesses as well as for the communities and customers that it serves. For example, the policy calls for Avangrid to “promote access to affordable energy for low income and rural communities,”<sup>4</sup> a commitment that is particularly relevant in the NYSEG and RGE service areas, which include relatively high proportions of both.

Avangrid has identified several actions that are being taken by its utility businesses, including NYSEG and RG&E, that will reduce the GHG emissions associated with (1) operating the existing gas infrastructure, and (2) heating and other customer energy requirements, including:

- replacement of leak-prone pipe;<sup>5</sup>
- investments in advanced leak detection and gas capture technologies;
- connection of renewable natural gas (“RNG”) from farms, wastewater treatment facilities and landfills;
- studying the blending of green hydrogen with natural gas in distribution facilities;<sup>6</sup>
- facilitating the adoption of electric heat pumps and other cleaner, less-emissions-intensive heating options as part of a beneficial electrification strategy; and
- helping residential, commercial, industrial, and institutional customers increase their energy efficiency while lowering their energy costs and environmental emissions.<sup>7</sup>

Avangrid Renewables expects to invest \$4.3 billion by the end of 2025 to support US emissions reductions including significant growth in renewable capacity such as solar and onshore wind as well as innovation and emerging technologies such as offshore wind, green hydrogen, and storage.

### Policy Guidance and Implications for the LTP

The LTP is influenced by policy guidance that takes many forms. It includes the CLCPA legislation and the associated compliance proceeding, the Commission’s Gas Planning Order and the Order regarding the National Fuel Gas Distribution Corp. (“NFG”) LTP, the recent order in the Companies’ 2022 rate proceeding, and other ongoing Commission proceedings that address specific elements of the LTP (e.g., energy efficiency, RNG, utility thermal energy networks).

Under New York Public Service Law, gas and electric utilities have the obligation to provide service that is “safe and adequate and in all respects just and reasonable.”<sup>8</sup> In 2019, the CLCPA established New York state-wide goals

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<sup>4</sup> *Avangrid Sustainable Development Policy, February 16, 2023, p. 3.*

<sup>5</sup> *The Joint Proposal in Case 22-E-0317, et. al., reflects an agreement to continue NYSEG and RG&E’s leak-prone pipe replacement over the next 3 years, albeit at a slower rate in recent years as the Companies are nearing the end of their program.*

<sup>6</sup> *NYSEG and RG&E are monitoring blending pilot projects in other jurisdictions.*

<sup>7</sup> *Avangrid 2022 Sustainability Report, p. 33.*

<sup>8</sup> *New York Public Service Law – PBS §65.1.*

to reduce GHG emissions from a 1990 baseline by 40 percent by 2030 and 85 percent by 2050.<sup>9</sup> The CLCPA codified specific objectives for the electricity sector but did not establish GHG emissions reductions targets for the gas sector or for specific gas LDCs.<sup>10</sup>

There is considerable variation among LDC service areas within New York. Each LDC long-term plan must be tailored to account for service area-specific characteristics including customer energy profiles, the proportion of customers served within disadvantaged communities (“DACs”), the regional economy, utility infrastructure and supply portfolios, and local weather conditions. More generally, long-term natural gas plans must strike a balance between accommodating uncertainties regarding future determinants of energy demand and supply over the 20-year term of the plan and the need to take actions to make meaningful progress in reducing GHG emissions and to contribute learning that will improve the efficiency and effectiveness of the long-term plan.

The CLCPA also requires state agencies to take actions to ensure: (1) that at least 35 % of benefits from energy program spending (e.g., energy efficiency and electrification) be directed to DACs, with a goal of 40% and (2) that their decisions will not “disproportionately burden disadvantaged communities”.<sup>11</sup> Policy makers are also responding to evidence of the impact of climate change in New York, including an increase in the frequency and severity of storms, by placing greater emphasis on the resilience of energy networks and the reliability of energy supply on the coldest and hottest days of the year.<sup>12</sup>

The Commission has initiated several regulatory initiatives that are aligned with the CLCPA. The Gas Planning Order established a gas system planning process for natural gas LDCs in New York, with a requirement that planning be performed in a manner that is consistent with the CLCPA. The Gas Planning Order, however, declined to establish specific GHG emissions reductions goals for the gas sector or individual LDCs, stating that, “the CLCPA does not impose specific requirements on the State’s gas distribution system.”<sup>13</sup> The process established in the Gas Planning Order requires each LDC to file a long-term plan every three years<sup>14</sup> plus annual updates on May 31st in the interim years. The three-year cycle is designed to provide for future comprehensive updates to reflect new information and insights that inform the long-term plan. Therefore, while the Companies’ LTP necessarily incorporates a 20-year forecast of many data inputs and assumptions, the focus should be on whether the Companies’ three-year action plan is reasonable given current facts and circumstances.

The Companies’ LTP complies with the requirements established in the Gas Planning Order. The LTP includes modeling of specific actions related to decarbonizing the natural gas business (“decarbonization actions”) and produces an estimate of the GHG emissions reductions and cost impacts resulting from each decarbonization action and for the overall collection of actions. The quantitative analysis provides projections of GHG emissions

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<sup>9</sup> *The Commission has acknowledged that “the CLCPA contains no mandates or guidelines directly related to emissions associated with the State’s gas distribution system or gas supplied by utilities.” (Case No. 22-M-0149, Order Assessing Implementation of and Compliance with the Requirements and Targets of the CLCPA, Public Service Commission, May 12, 2022, p. 23).*

<sup>10</sup> *CLCPA § 66-p (2), p. 17.*

<sup>11</sup> *CLCPA § 75-0117 Investment of funds, p. 16; CLCPA §7 Climate change actions by state agencies, p. 19.*

<sup>12</sup> *See, for example, “Climate Change Vulnerability Study, New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation,” Case 22-E-0222, September 22, 2023.*

<sup>13</sup> *Gas Planning Order, p. 4.*

<sup>14</sup> *The Companies’ LTP is the third such filing, following National Fuel Gas (December 22, 2022) and Consolidated Edison/Orange & Rockland (May 31, 2023).*

reductions, natural gas bill impacts, and other implementation costs based on the assumed adoption rate of each of six decarbonization actions. The Companies have also considered several scenarios and recommendations from stakeholders in the development of their LTP.

Other integral elements of the LTP include refinements to the process to identify and implement non-pipe alternatives (“NPA”) and initiatives that address the needs of DACs and low- and moderate- income (“LMI”) customers. Notably, NYSEG and RG&E’s gas service areas include 80 and 86 DACs, respectively, including many rural communities. The LTP provides an opportunity to consider how to make progress in addressing environmental justice priorities and the needs of LMI customers, located within and outside of DACs.

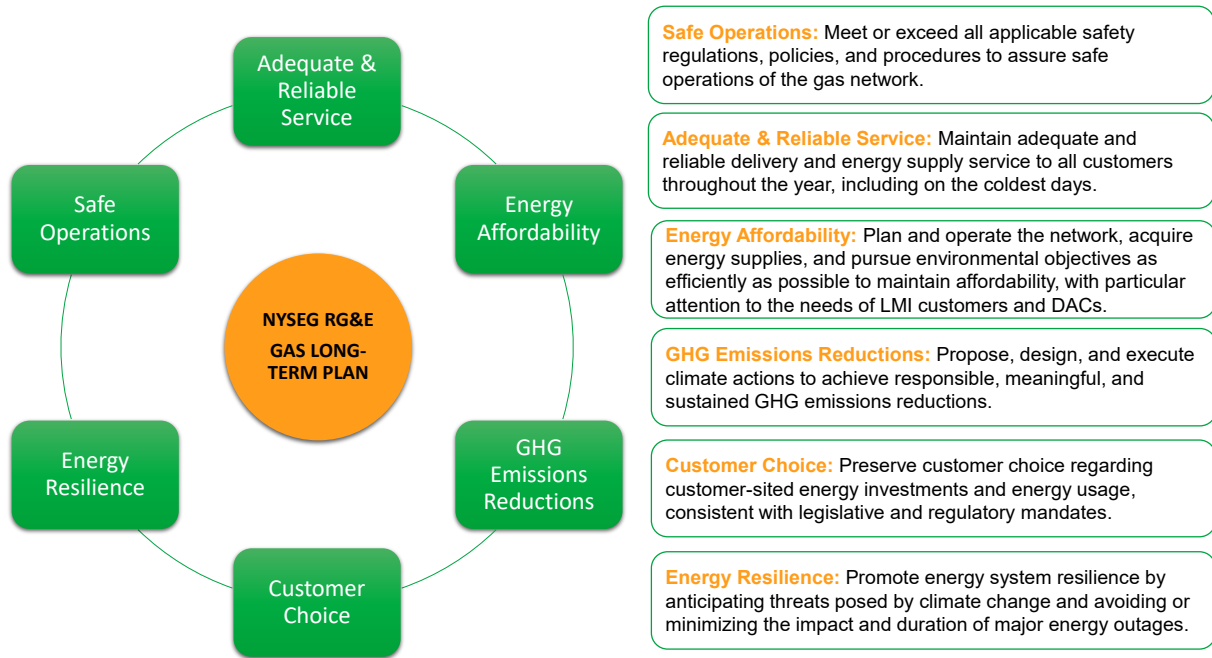
Finally, as noted above, the LTP must consider “on-the-ground” realities. The assumptions reflected in the quantitative assessment and the design of other elements of the LTP must be consistent with these realities. The decarbonization of the energy sector will require hundreds of thousands of the Companies’ customers, and millions of customers across New York to make decisions regarding their energy equipment and use profiles. These potential conversions and the associated impacts on natural gas and electricity infrastructure will need to occur building-by-building, street-by-street, and neighborhood-by-neighborhood. The overlapping of affiliated and non-affiliated natural gas and electric utilities will present planning, investment, and operational challenges. The timing and cost of the transition will also depend on the responsiveness of equipment manufacturers and local contractors over the 20-year LTP period and beyond. Chapter IV of the report describes this transition in practical terms including what will be required from unregulated participants (including building owners, HVAC contractors and manufacturers, and financial institutions) and communities.

It is notable that each LDC is required to submit a long-term “plan” as opposed to a “pathway study” as there are clear distinctions. A decarbonization pathway study evaluates hypothetical strategies to achieve pre-determined GHG emissions reductions targets over time. In contrast, the LTP is developed by combining various levels of decarbonization actions with assumptions that are based on the best available information to produce a feasible plan that is projected to achieve GHG emissions reductions as cost efficiently as possible while satisfying objectives that are expressed in the Guiding Principles. The LTP must provide valid projections of costs, bill impacts, and GHG emissions reductions that can inform subsequent utility proposals and Commission decisions.

## **Guiding Principles**

The development of any long-term plan begins with establishing a clear vision of the desired outcomes for the Companies’ customers and communities served. Figure ES-1 presents the Guiding Principles that the Companies used to develop and evaluate their LTP. The LTP must reflect a judicious balance among the collection of principles as well as address each principle on its own.

**Figure ES-1: NYSEG and RG&E's Guiding Principles**



Some principles are absolute requirements, with "Safe Operations" as the best example for an LDC. With respect to the other principles, a balancing is required resulting in an LTP that provides safe, reliable, and affordable energy service that delivers sustainable reductions in GHG emissions while preserving customer choice.

The "Adequate & Reliable Service" principle applies to the mix of energy sources that customers rely on. This principle takes on a particularly critical role when considering the electrification of heating due to the potential consequences of an extended electric outage that coincides with extremely cold temperatures. NYSEG and RG&E's customers frequently experience cold temperatures for prolonged periods of time, reinforcing the importance of adequate and reliable service.

The "Customer Choice" principle reflects the Companies' awareness of the strong preferences of both residential and business customers to make their own decisions with respect to end-use equipment and energy usage. Mandates that restrict choice are likely to be met with opposition, particularly if they are accompanied by meaningful customer expense or inconvenience. This is an example of an "on-the-ground reality" that could shape the path to decarbonization.

### Natural Gas Decarbonization Actions

The Companies' LTP focuses on six specific decarbonization actions that can reduce GHG emissions associated with the Companies' natural gas businesses:

- **Weatherization** – Installing weatherization measures (such as insulation) at residential, commercial, and municipal customer premises will reduce energy use, and therefore reduce GHG emissions. In many

instances, weatherization will become an element of a customized clean energy solution for individual commercial and municipal customers.

- **Electrification** – Electrifying existing natural gas heating systems by installing either air source heat pumps (“ASHP”) or ground source heat pumps (“GSHP”) and electrifying other existing gas appliances will reduce natural gas use and increase electric use, providing a net decrease in GHG emissions, assuming the use of traditional natural gas and that electric generation has low GHG emissions. Building electrification for residential, commercial, and municipal customer segments is modeled. Two heating electrification options are considered: full electrification using cold-climate heat pumps (“ccASHP”) or GSHP to provide heat throughout the winter, and hybrid heating using either a standard ASHP or ccASHP to provide heat during shoulder periods and mild winter days coupled with a gas furnace or boiler to provide heat on cold winter days. Full electrification requires a more substantial buildout of generation, transmission, and distribution infrastructure to meet peak heating demand during the winter season; hybrid heating relies on the existing gas infrastructure to heat buildings during the coldest days of the year. Early evidence suggests that the buildout of the electric system will face timing and cost challenges.
- **Industrial Customer Programs** – The industrial sector is generally recognized as the most challenging sector to decarbonize, particularly with respect to process loads that require extremely high temperatures and for facilities that face internal and external competition. However, some industrial customers that are part of larger, global entities with decarbonization commitments that are aligned with the Paris Agreement may be more likely to invest in GHG emissions reduction activities. Three sub-actions are modeled for industrial customers: increasing the efficiency of natural gas use in process loads, electrifying space heating, and employing carbon capture.<sup>15</sup>
- **Utility Thermal Energy Networks (“UTENS”)** – GHG emissions could also be reduced by replacing natural gas heating systems with GSHP served by underground geothermal networks or other thermal resources; however, UTENS face siting and other development challenges. Generic UTENS projects are modeled based on information from the Companies’ two geothermal pilot programs.
- **RNG** – Using RNG as a substitute for natural gas eliminates the GHG emissions from the biogas feed source that would have otherwise been emitted to the atmosphere. Therefore, replacing traditional natural gas with RNG will reduce GHG emissions. The Companies assume that they will procure RNG from within their service territories and a small share of the RNG from Pennsylvania and Ohio. All RNG is assumed to be produced from existing sources and transported via pipeline.
- **Green Hydrogen<sup>16</sup>** – Replacing traditional natural gas with green hydrogen eliminates GHG emissions associated with combustion of natural gas, but additional study is required to understand the amount of hydrogen that can be safely blended into the natural gas distribution network. Hydrogen may also be a viable option for direct use for industrial process loads.

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<sup>15</sup> NYSEG and RG&E will also engage with industrial customers to discuss other potential decarbonization solutions including the direct use of RNG, LNG, and hydrogen.

<sup>16</sup> “Green Hydrogen” is produced by splitting water into its hydrogen and oxygen elements using electrolysis that is powered by renewable energy sources (e.g., wind and solar energy).



Many individual decarbonization actions and other elements of the LTP will require changes to business practices, new or modified customer programs, as well as adjustments to regulatory policies.

## LTP

The LTP methodology incorporates quantitative analyses, qualitative assessments related to customer behaviors and feasibility, consideration of customer and stakeholder perspectives, and evaluation of risks and uncertainties. This work starts with an examination of the current business circumstances (markets, asset base, customer programs, policies, and regulation) and ultimately produces an LTP that achieves desired future outcomes as delineated by the Guiding Principles.

The quantitative analysis of the gas decarbonization actions employs a bottom-up approach reflecting: (1) incremental equipment cost and incremental energy bills per participating customer or incremental cost per unit of RNG or hydrogen; and (2) incremental benefits (e.g., decreased emissions per participating customer or decreased emissions per unit of RNG or hydrogen) for each decarbonization action. There is considerable uncertainty regarding the future costs and benefits associated with each of the six gas decarbonization actions, as well as the customer adoption trends for actions that involve customer choice. There are also fundamental questions as to the potential contribution of individual decarbonization actions over the twenty-year period. These uncertainties are examined by performing scenario and sensitivity analyses, including modeling four scenarios developed by the Companies, six scenarios developed by CRA working with stakeholders, plus three sensitivities recommended by CRA and/or stakeholders. Scenarios are not alternative plans but inform the development of the LTP by providing insights with respect to the contribution of individual decarbonization actions on key outcomes (including GHG emissions reductions and costs).

Consistent with the Guiding Principles, the Companies' LTP strives to provide safe, reliable, and affordable energy service while delivering sustainable GHG emissions reductions and preserving customer choice throughout the plan period. Given the significant uncertainty associated with major factors that impact decarbonization timing and outcomes, including future policy developments, technology development, customer behavior, electric infrastructure development, and costs, the Companies believe it is appropriate to preserve optionality by including all six decarbonization actions in its LTP.

The relative cost effectiveness of reducing GHG emissions differs considerably across decarbonization actions. Focusing efforts on decarbonization actions that have relatively low cost per GHG emissions reductions (measured as \$/MT CO<sub>2</sub>e) will provide benefits to customers by addressing affordability concerns. It is important that the LTP maximize implementation of decarbonization actions that have the lowest cost per unit of GHG emissions reduction, such as RNG and hydrogen, as these actions have the "biggest bang for the buck" for customers. Unfortunately, these lower cost decarbonization actions are expected to have a limited impact on emissions reductions given current technologies (e.g., RNG is limited by the quantity of existing feedstocks and is not expected to be produced in large enough quantities to replace all existing traditional gas use). Therefore, it is necessary to balance including higher cost decarbonization actions, such as electrification, to increase GHG emissions reductions while considering overall cost.

Hybrid heating is selected as the preferred approach to electrification instead of full electrification due to the beneficial impacts on reliability of service and overall energy resilience as well as on electric system planning and costs. Full electrification presents concerns about the reliability of heat due to the potential for electric outages



during cold winter days with no natural gas backup. In addition, wide adoption of full electrification will require significant investment in the electric infrastructure (generation, transmission, distribution, and behind-the-meter). Hybrid heating results in a meaningful reduction in the use of natural gas thus providing GHG emissions benefits, while also acting as an electricity demand response option by eliminating electric demand for heat on cold days, significantly reducing costs and keeping customers safe.

Table ES-1 summarizes the specification of the LTP.

**Table ES-1: Specification of the LTP**

	Action	LTP
1	Weatherization	<ul style="list-style-type: none"> <li>• <b>Residential:</b> 1% of homes/year in 2027, incremental participation growing by 0.25%/year.</li> <li>• <b>Commercial:</b> 0.5% incremental heat load reduction/year</li> <li>• <b>Municipal:</b> 1% incremental heat load reduction/year</li> </ul>
2	Electrification	<ul style="list-style-type: none"> <li>• 2027 start, all segments convert customers with furnaces to hybrid heating systems (standard ASHP paired with gas furnace) at equipment end-of-life</li> <li>• <b>Residential:</b> conversion pace ramps up at 5.4%/year until it reaches a peak of 75%</li> <li>• <b>Commercial:</b> conversion pace ramps up at 2.1%/year until it reaches a peak of 30%</li> <li>• <b>Municipal:</b> conversion pace ramps up at 3.6%/year until it reaches a peak of 50%</li> </ul>
3	Industrial Customer Programs	<ul style="list-style-type: none"> <li>• <b>Energy Efficiency of Process Load:</b> 2027 start, 0.5% process load reduction/year</li> <li>• <b>Electrify Space Heating:</b> 2027 start, convert customers with furnaces to hybrid heating systems (standard ASHP paired with gas furnace) at equipment end-of-life at a conversion pace that ramps up at 2.1%/year until it reaches a peak of 30%</li> <li>• <b>Carbon Capture:</b> (large customers) 0.5% carbon capture/year starting in year 2028 achieving 8% carbon capture by 2043</li> </ul>
4	UTENS	<ul style="list-style-type: none"> <li>• 2035 start, one project of 24 residential and 8 non-residential buildings every other year</li> </ul>
5	RNG	<ul style="list-style-type: none"> <li>• 2026 start, Optimistic Growth level of RNG produced in LDC territory plus 2% of RNG produced in PA and OH</li> </ul>
6	Hydrogen	<ul style="list-style-type: none"> <li>• 2028 start, blend incremental 1.25%/year</li> </ul>

Taken together, the decarbonization actions included in the Companies’ LTP will make substantial contributions toward achieving New York’s decarbonization goals. As shown in Table ES-2, the LTP for NYSEG achieves a 55% reduction in GHG emissions by 2043 at a total cost of \$2.5 billion and a cost per emissions reduction of \$330/MT CO2e. The LTP for RG&E achieves a 50% reduction in GHG emissions by 2043 at a total cost of \$2.4 billion and a cost per emissions reduction of \$350/MT CO2e.

**Table ES-2: GHG and Cost Metrics – LTP**

	Cost per GHG Emission Reduction (\$/MT CO2e)	2043 GHG Reduction (%) vs. 1990)	Total Cost 2024-2043 (NPV \$M)	2043 Electric Winter Peak Demand Impact (MW)
<b>NYSEG</b>	\$ 330	-55%	\$ 2,512	29
<b>RG&amp;E</b>	\$ 350	-50%	\$ 2,447	36

## Other Elements of the LTP

Other important elements of the Companies' LTP that were not included in the quantitative modeling include the approach to DACs and LMI customers and NPAs.

### *DACs and LMI Customers:*

The Companies serve approximately 200,000 gas customers in 166 DACs. The DACs include both urban and rural communities. The Companies also have gas LMI customers that do not reside within DACs. NYSEG and RG&E are currently delivering GHG reduction and economic benefits to DACs and LMI customers through several policies and programs including:

- Offer EE and building electrification programs that deliver benefits to LMI customers.<sup>17</sup>
- Explicit consideration of DACs as part of the NPA process.
- Development of metrics to track performance related to DACs (*i.e.*, to measure the extent to which clean energy program benefits are effectively directed to these communities).<sup>18</sup>
- Procurement practices that result in 85% of vendor companies meeting sustainability standards based on a 43-factor Environmental, Social, Governance score.
- Continuation of the Residential Methane Detection Program that distributes devices to low-income customers to alert customers of the presence of methane in their homes, accompanied by safety outreach and education.

### *NPAs:*

The Companies are committed to building a robust and diverse portfolio of NPA projects that will grow over time as new opportunities emerge to address traditional natural gas system needs through cost-effective and innovative NPA solutions. As part of the Joint Proposal approved by the Commission, the Companies agreed to continue to evaluate future gas projects, including leak-prone main replacement projects, for the applicability of NPAs.<sup>19</sup> The Companies are proactively considering strategic downsizing through employing NPAs in lieu of replacing leak-prone mains but note that it will be rare to find leak-prone main segments: (1) that are not necessary to deliver gas to customers downstream of the segment; and (2) on which 100% of existing gas loads will electrify. Over the past two years, over 450 gas projects were screened for NPAs and two have been successfully implemented, with the potential of a third. However, Companies continue to evaluate all leak prone main replacement projects for NPA suitability and have developed a comprehensive offer to encourage customers located in targeted leak prone main replacement areas to pursue whole-home electrification. To date, NPAs targeting leak prone main replacements have allowed three customers to electrify and 119 feet of distribution mains to be decommissioned in Irondequoit, NY. The Companies are gaining experience in what may be the most

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<sup>17</sup> *The recently approved 2026-2030 Energy Efficiency and Building Electrification budgets are available to assist all eligible customers. The Commission did not separately earmark budgets for DACs or LMI customers, however the Companies will continue to estimate and report benefits to LMI customers and DACs.*

<sup>18</sup> *This is reflected by an annual reporting requirement in the Joint Proposal to report on the impact of various programs in DACs, including clean energy spending, as well as reporting requirements in the EE/BE Order.*

<sup>19</sup> *Joint Proposal, Case 22-E-0317, et al., Appendix M.*

challenging step in the process: negotiating and finalizing contracts with winning bidders that provide a sufficient level of reliability at a final cost that is acceptable from the perspective of the Companies and customers, the NPA provider, and by inference, the financial entity or entities that provide financial backing for the NPA provider.

### Addressing Uncertainty

The LTP represents a 20-year perspective on a challenging future that will be characterized by continued evolution of policies, economic and environmental trends, and technological innovation. As such, most of the LTP's key drivers are subject to some level of uncertainty, including:

- Customer acceptance of building heating modernization related to fuel sources, equipment technologies, and conservation;
- Regulatory actions related to the CLCPA legislation and emission reduction targets that may impact the gas distribution system over the next 20 years;
- Continued evolution of New York energy policy and Commission regulatory requirements (e.g., allowing the cost of RNG and hydrogen to be recovered by utilities, and policies to mitigate up-front cost barriers associated with installing equipment at customer premises to enable decarbonization);
- Technology advancement including the viability, scalability, and cost of several different technologies related to: heat pumps, RNG, hydrogen, UTENs, and carbon capture and storage;
- Future all-in delivered cost of gas and electricity as well as changes to cost recovery and rate design that may influence customer decisions; and
- Market conditions including workforce training and availability, supply-chain issues, inflationary pressures, investor initiatives, and global energy instability.

The three-year LTP cycle prescribed in the Gas Planning Order provides for future comprehensive updates that reflect new information related to all of these uncertainties.

### Implementation Actions

On October 12, 2023, the Commission approved the Rate Case Joint Proposal that incorporates several commitments that are aligned with the LTP. In addition, other initiatives that impact the implementation of the LTP have either recently been decided or are currently being addressed in Commission proceedings (e.g., GHG inventory reporting, energy efficiency and building electrification programs, and UTENs pilots). Lastly, there are several initiatives that the Companies have identified that will contribute to achieving LTP outcomes and are consistent with the Guiding Principles. Most of these initiatives contribute to reducing GHG emissions and reducing costs associated with GHG emissions reductions, thereby improving affordability.

The execution of individual decarbonization actions included in the LTP will each require a detailed implementation plan with associated resource commitments, associated expenses, and in many cases, investments in infrastructure. There are existing planning and regulatory review processes for energy efficiency programs. It is likely that there will need to be new and/or modifications to existing electrification programs to reflect lessons that are learned in the early years. While RNG remains the subject of policy debate, the implementation will be relatively straightforward and focus on connecting new projects, entering contracts, and

addressing ratemaking/cost recovery issues. There is much learning that needs to occur with respect to UTENS, hydrogen, and the industrial sector before the Companies can develop comprehensive implementation plans. The Companies will pursue numerous actions in the next three years to develop capabilities and implement actions related to its LTP that relate to energy efficiency and electrification programs, DACs and LMI customers, investments that contribute to LTP outcomes, and pilot programs that will provide insights that inform future LTPs.