Final Long-Term Plan

Executive Summary

National Fuel Gas Distribution Corporation

July 17, 2023

Case 22-G-0610

National Fuel®

Executive Summary

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National Fuel Gas Distribution Corporation (“National Fuel” or “Company”) submits this Long-Term Plan ("LTP" or “Long-Term Plan”) in accordance with the New York Public Service Commission’s (“Commission”) May 12, 2022 *Order Adopting Gas System Planning Process* (“Gas Planning Order”). National Fuel’s LTP demonstrates the Company’s commitment to pursuing responsible greenhouse gas ("GHG") emissions reductions, enhancing the resilience of the energy supply system, and delivering safe, reliable, resilient, and affordable energy service to approximately 540,000 customers across a population of more than 1.6 million people[1] in western New York.[2]

1. National Fuel’s LTP is Guided by the Gas Planning Order and Responsibly Reduces Emissions Consistent with the CLCPA

The Gas Planning Order establishes a natural gas system planning process, the hallmark of which is the filing of long-term plans by each of New York’s local distribution companies (“LDCs”), with National Fuel filing its plan first. The order states that natural gas system planning “must be conducted consistent with” the Climate Leadership and Community Protection Act of 2019 ("CLCPA"). The CLCPA established economy wide goals to reduce GHG emissions in New York by 40 percent in 2030 and 85 percent by 2050 relative to a 1990 baseline. In this regard, the Gas Planning Order acknowledges the following:

> 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.

In preparing this LTP, National Fuel has focused on maximizing its contribution to achievement of the statewide emissions goals while maintaining or enhancing safety, reliability, resilience, and affordability for customers and communities.

2. National Fuel’s LTP is Shaped by the Requirements of its Service Area

A long-term natural gas system plan must reflect the weather and economic-related features of a utility’s service area, including the priorities of customers and communities. National Fuel’s

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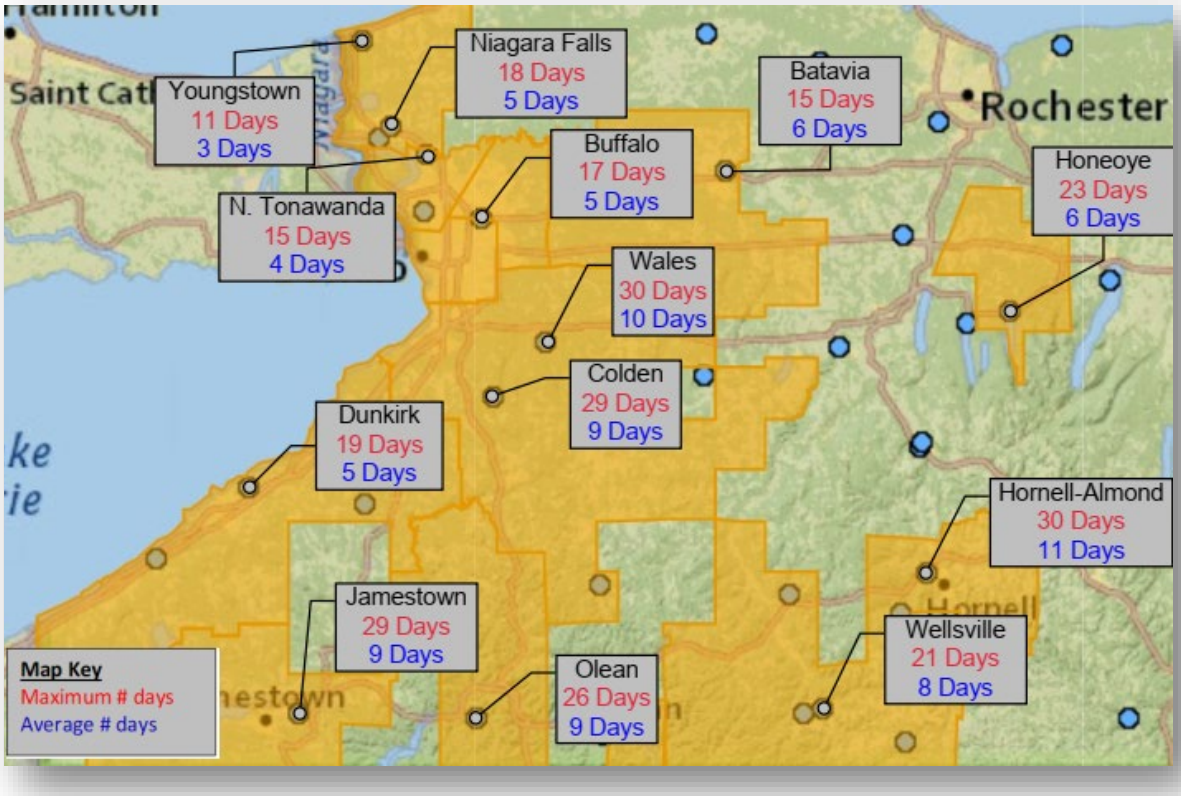
1 Values obtained from 2020 US Census data for each community within National Fuel’s service territory.

2 National Fuel retained Concentric Energy Advisors, Inc., a management consulting and financial advisory firm that focuses on the North American energy market, to perform underlying analyses and prepare this LTP report.

service area, located in western New York, experiences severe weather conditions and a challenging economic environment.

- ***Weather-Related Challenges*:** Ensuring safe, reliable, resilient, and affordable energy for heating is especially important in National Fuel's service territory. Approximately 90% of the Company's 506,000 residential customers rely on natural gas for heating and the communities it serves experience longer winters with some of the coldest temperatures in New York. As shown in Figure ES-1, several communities have experienced over 20 days in a winter with average temperatures below 10 degrees. On these cold winter days, natural gas represents approximately 94% of a typical residential customer's energy use.

Figure ES-1
Annual Winter Days with an Average Temperature at or Below 10°F[3]



National Fuel's service territory also frequently experiences extreme winter weather events, often accompanied by high winds, ice, and/or multiple feet of snow in a short

[3] These temperatures represent the 15-year (2006-2020) average for the winter period of November – March as reported by NOAA.

period of time.[4] The most recent example is the 2022 Christmas blizzard. During that multi-day event, more than 100,000 electric customers lost power and relied on National Fuel's natural gas deliveries to fuel equipment such as fireplaces, hot water tanks, and back-up generators to maintain life sustaining heat. A plan that contemplates future sources of energy and technologies to meet the winter heating demands of National Fuel's customers must ensure that the supply and delivery capabilities are as reliable as today's natural gas system.

- ***Upstate New York Economy***: Maintaining energy affordability for customers and communities is critical to a responsible plan for decarbonization. The median household income in National Fuel's service territory is below national and state averages, with the cities of Jamestown and Buffalo having approximately double the state poverty rate, and those cities along with Niagara Falls more than doubling that rate nationally, as shown in Table ES-1.

Table ES-1
Demographic Data[5]

	National Fuel's Service Territory				New York State	U.S.
	Overall Territory	City of Buffalo	City of Niagara Falls	City of Jamestown		
Median Household Income	$60,977	$42,186	$43,336	$36,162	$75,157	$69,021
Poverty Rate	13.8%	27.6%	23.8%	28.1%	13.9%	11.6%

Furthermore, approximately 46% of the natural gas delivered by the Company is used to fuel commercial and industrial customers' businesses that support local jobs and tax base. Many of these commercial and industrial customers rely on affordable energy as a major input in their business. The Company is particularly mindful that if significant increases in energy costs cause some businesses to shut down operations in western New York in favor of locations with lower energy prices, it would have a significant negative effect on the local economy.

[4] In November 2022, record-breaking heavy snowfall in portions of the Company's service territory downed power lines and resulted in power outages to thousands of western New York homes and businesses. More than 6.5 feet of snow fell in some areas. Locations with the highest totals experienced heavy snowfall at a rate of six inches per hour. See, https://spectrumlocalnews.com/nys/buffalo/weather/2022/11/28/recapping-the-2022-november-lake-effect-snowstorm

[5] U.S. Census Bureau's July 1, 2022 (V2022) Population Estimate Program, American Community Survey, 5-Year Estimates, and National Fuel Gas's 2022 residential account locations.

3. *National Fuel's LTP is Designed to Meet "Guiding Principles" that are Core to its Mission to Ensure Energy Security and Affordability for its Customers*

The Gas Planning Order identifies costs, bill impacts, and emissions impacts as the principal metrics for evaluating utility long-term plans. It identifies other important objectives as well, including maintaining safety, reliability, and resilience, while delivering benefits to disadvantaged communities.

Development of any long-term plan begins with establishing a clear understanding of the desired outcomes. Figure ES-2 presents the "Guiding Principles" that National Fuel used to develop and test its LTP. These principles are consistent with the metrics and objectives of the Gas Planning Order and the Company's own mission to ensure energy security and affordability for its customers. The LTP must satisfy the overall collection of principles as well as each principle on its own.

Figure ES-2
National Fuel's Guiding Principles

Safe Operations	Meet or exceed all applicable safety regulations, policies and procedures to assure safe operations of the transmission and distribution network, consistent with National Fuel's "Safety-First" Culture.
Reliable Service	Maintain reliable delivery and energy supply service to all customers throughout the year, including on the coldest days.
Energy Resilience	Contribute to realization of overall energy system resilience (including electricity and natural gas service) by anticipating threats posed by climate change and avoid or minimize the impact and duration of major energy outages.
Energy Affordability	Plan and operate the network, acquire energy supplies, and pursue environmental objectives as efficiently as possible in order to maintain affordability for all customers, with particular attention to the needs of low- and moderate-income customers and disadvantaged communities.
GHG Emissions Reductions	Propose, design, and execute climate actions to achieve responsible, meaningful, and sustained GHG emissions reductions while maintaining safe, reliable, resilient and affordable energy service.
Customer Choice	Preserve customer choice, consistent with legislative and regulatory mandates, with respect to customer-sited energy investments and energy usage.

Some principles are "absolute" requirements; "safety" is perhaps the best example for regulated distribution utilities. Other principles may be expressed to acknowledge that there are inherent tradeoffs among desired outcomes. With respect to National Fuel's LTP, the most important tradeoff is between cost and the goals of achieving GHG emissions reductions, enhancing energy system resilience, and maintaining safe, reliable, and affordable energy service for all customers.

National Fuel's LTP strives to maximize GHG emissions reductions while maintaining affordability, reliability of energy supply, resilience, and safety.

4. National Fuel's LTP Reflects Extensive Stakeholder Feedback and Input

National Fuel's LTP has been shaped by extensive stakeholder engagement, which included participation by stakeholders, Staff, and Staff's consultant Charles River Associates ("CRA").[6] Stakeholders have had many opportunities to provide feedback and input that helped National Fuel develop its LTP, including two rounds of written comments after Initial and Revised LTP reports were filed and multiple technical sessions organized by Staff. In addition, stakeholders, Staff and CRA collaborated with the Company to develop three "Informational Scenarios."[7] National Fuel carefully considered the recommendations received by all participants. Proposals that improve National Fuel's LTP and are consistent with its Guiding Principles have been incorporated into its LTP modeling. These include the following modifications to the modeling of individual decarbonization actions and assumptions:

National Fuel's LTP incorporates valuable input provided by stakeholders over the last several months.

<u>Customer Decision Points and Adoption Rates</u>:

- Electrification: assume that customers will consider converting to a heat pump when central air conditioning reaches an end of life (not only when the heating system fails);

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6 Active stakeholders include: Alliance for a Green Economy ("AGREE"), *et al.,* Couch White for Multiple Intervenors, Environmental Defense Fund ("EDF"), Individuals (John Rath, Bob Wyman), Natural Resources Defense Council ("NRDC"), New York Department of State Utility Intervention Unit ("UIU"), New York Geothermal Energy Organization ("NY-GEO"), New York State Energy Research and Development Authority ("NYSERDA"), PUSH Buffalo, Ratepayer and Community Intervenors, and Sierra Club ("SC")/Earthjustice ("EJ").

7 The results of the Informational Scenarios are presented in Appendix K.

- Electrification: reflect new legislation that prohibits fossil fuel equipment in new buildings;[8]
- Electrification: increase electrification adoption rates for new customers; and
- Weatherization: assume that a meaningful proportion (50%) of residential customers will elect to weatherize their homes when they are installing a heat pump.

Specification of Decarbonization Actions:

- Air-Source Heat Pumps ("ASHP"): revise estimated up-front installation cost for a cold climate air-source heat pump ("ccASHP") downward by over 20%;
- ASHP: incorporate hourly load data in the operating profile;
- Weatherization: expand weatherization for residential and commercial customers;
- RNG: expand sourcing to neighboring states (Ohio and Pennsylvania);
- RNG: account for emissions attributable to transportation to New York for out-of-state RNG;
- Hydrogen: reduce hydrogen maximum in Aggressive Scenario;
- Energy Efficiency: defer initiation of new EE programs by one year (from 2024 to 2025); and
- RNG: Defer blending start by one year (from 2024 to 2025).

Calculation of Benefits and Costs:

- Electricity Distribution Utility Rates: incorporate more detailed modeling that reflects traditional ratemaking methodologies;
- Electricity Distribution Utility Rates: reflect forecasted increase in electricity sales;
- Electricity Wholesale Prices: incorporate changes to seasonal shaping of prices over time; and
- Gas Rates: incorporate avoided cost of new meters/services as an element of costs associated with electrification of new customers.

Production of Additional Model Outputs

- GHG emissions reduction detail for 2030 for all scenarios;
- Design day demand forecast over the 20-year forecast period for all scenarios;
- BCA results for all scenarios, not just the LTP

[8] Stakeholders recommended that National Fuel increase electrification adoption rates to reflect anticipated legislation that would prohibit fossil fuel equipment in new buildings. In May 2023, a version of this legislation was enacted and National Fuel incorporated the impacts of the new legislation in its LTP.

- Annual throughput forecast by customer type over the 20-year forecast period for all scenarios;
- Annual throughput forecast by fuel type over the 20-year forecast period for all scenarios; and
- Annual customer count forecast over the 20-year forecast period for all scenarios.

Following thorough consideration, the Company refrained from adopting some alternative assumptions suggested by stakeholders and CRA because they are currently subject to considerable uncertainty, presented feasibility concerns, and/or are not consistent with the Guiding Principles. In many cases, the impacts of these assumptions have been evaluated in sensitivity analyses.

5. The Gas Planning Order Contemplates an Evolving Long-Term Plan

National Fuel's LTP examines how specific decarbonization actions are expected to contribute to GHG emissions reductions along with the associated costs and bill impacts over a twenty-year period, yielding near-term (three-year) implementation actions. The LTP represents a snapshot in time and will be updated periodically to reflect the latest information regarding demand, supply, and technology attributes. Ideally, the LTP should preserve optionality to respond to future developments and ensure continued energy reliability.

As contemplated by the Gas Planning Order, LDC long-term plans will be subject to periodic updates with new long-term plans prepared every three years. Each of these subsequent "snapshots" provides an opportunity to update assumptions and reflect changes in technology, legislative and regulatory directives and other relevant developments that impact the availability and cost of decarbonization actions. Scenario and sensitivity analyses help to assess the impact of assumptions that are subject to increasing uncertainty over time, with the understanding that assumptions will be updated with each long-term plan. National Fuel has applied consistent criteria to distinguish between assumptions that can be reflected in this LTP and assumptions that require further evidence and experience and will be incorporated in future LTPs.

An LTP must be technically feasible, include near-term actions, and provide valid projections of costs, bill impacts, and GHG emission reductions that can inform subsequent utility proposals and decisions. Technical feasibility takes on increased importance when developing a plan that relies on circumstances beyond the control of a utility, e.g., customer choices regarding energy equipment and energy usage, and contractor availability to develop energy infrastructure and install building heating and cooling systems.

6. *The Quantitative Analytical Framework Examines the Tradeoff between GHG Emissions Reductions and Total Costs*

National Fuel's LTP is informed by scenario analyses that examine the economic and GHG emissions reductions impacts of six quantifiable "decarbonization actions":

1. **Energy Efficiency:** National Fuel modeled two new energy efficiency programs targeted to the residential class (weatherization and home energy reports) and one new energy efficiency program for the small commercial class (weatherization).

2. **Electrification:** The model incorporates a robust approach to electrification of existing space heating loads for several separate market segments, including residential, small commercial, universities and colleges, and large multi-family customers, as well as electrification of other gas appliances (water heating, dryer, and cooking ranges).

3. **Industrial Customer Programs:** There are technological and competitive challenges related to achieving GHG emissions reductions for National Fuel's industrial customers.[9] The model considers two forms of decarbonization actions for these customers: electrification of space heating loads and performing energy efficiency for process loads.

4. **Thermal Energy Networks ("TENs"):** National Fuel and other New York investor-owned utilities are proposing TENs (including networked geothermal) pilot programs within their respective service areas. The model includes additional TEN projects over the 20-year LTP period.

5. **RNG:** RNG is biogas that has been converted into pipeline-quality gas and is considered a "drop in" replacement for natural gas. Using RNG as a substitute for natural gas captures the GHG emissions from the biogas feed source that would otherwise have been emitted to the atmosphere, resulting in significant GHG emissions reductions and environmental benefits. One of the benefits of RNG is that it can be easily blended into the gas supply and does not require building-by-building installations of equipment.

6. **Hydrogen:** Blending green hydrogen into natural gas for redelivery to customers reduces GHG emissions associated with combustion. Hydrogen can be blended into the gas supply and does not require building-by-building installations of equipment at low blending levels.

The quantitative performance of the collection of these six actions is captured by three metrics:

[9] "National Fuel Gas Distribution Corporation Informational Filing" submitted on June 15, 2022 in Case Nos. 20-G-0131 and 22-M-0149 includes a detailed discussion of the opportunities and challenges facing National Fuel's industrial customers as they explore actions that they can take to reduce emissions.

1. **Reduction in GHG Emissions -** Annual GHG emissions impacts are estimated for the entire supply and delivery chain from gas production through gas consumption for all National Fuel customers to provide a comprehensive understanding of the emissions impacts associated with the decarbonization actions.

2. **National Fuel Gas Bill Impacts** - Incremental costs that are likely to be recovered through the gas rates paid by National Fuel's customers will increase National Fuel's revenue requirement and/or cost of gas. The impact on National Fuel's residential gas rates reflect the impact of decarbonization actions on both revenue requirements (numerator) and throughput (denominator).

3. **Decarbonization Policy Costs** – Decarbonization Policy Costs are costs that are incurred as a result of National Fuel's decarbonization actions but subject to recovery that will be determined by policy makers. Decarbonization Policy Costs may be funded through a combination of tax policies, natural gas or electric utility rates, utility program incentives, rate subsidies, transfer payments, and other mechanisms that supplement funds contributed by participants and other private sources.

The Company's LTP was developed using a bottom-up approach where per unit costs (e.g., incremental equipment cost and incremental energy bills per participating customer or incremental cost per unit of RNG or hydrogen) and benefits (e.g., decreased emissions per participating customer, decreased emissions per unit of RNG or hydrogen) were estimated for each decarbonization action. National Fuel assessed the relative efficiency of individual decarbonization actions in contributing to GHG emissions reductions (i.e., cost required per unit of GHG emissions reductions), as there is meaningful variation in efficiencies among the decarbonization actions.

7. National Fuel's LTP Maximizes GHG Emissions Reductions While Considering Affordability and Preserving Optionality

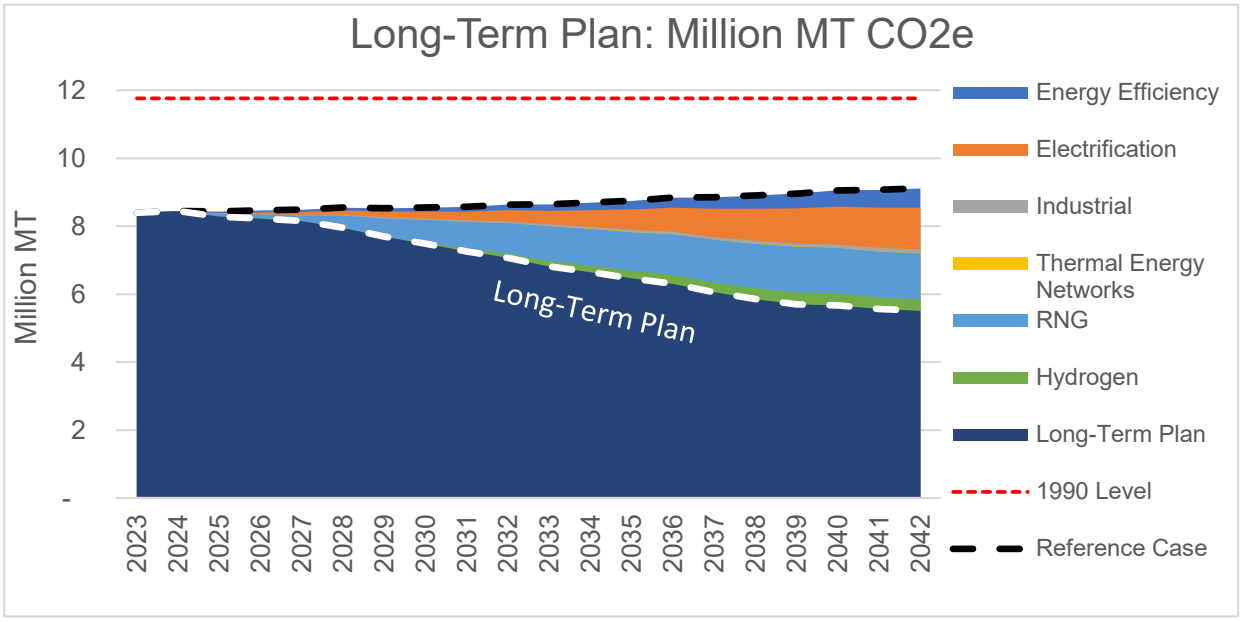
Taken together, the decarbonization actions included in National Fuel's LTP will make substantial contributions toward achieving New York's decarbonization goals.[10] The LTP is projected to reduce GHG emissions by 40% by the end of the 20-year horizon (2042) compared to Reference Case levels, and by 53% from 1990 levels as shown in Figure ES-3. The emissions

[10] The CLCPA specifies economy-wide goals but does not specify sector-specific or LDC-specific goals. The Climate Action Council's Scoping Plan recommends potential actions to achieve these goals, many of which require further action by local governments, the New York State Legislature, and/or state agencies. National Fuel's LTP is consistent with the CLCPA, the Gas Planning Order, and New York State's climate goals generally.

reductions start modestly and increase over time as constraints on deploying technology are resolved. Emissions reductions are expected to continue after 2042, through 2050 and beyond.

Figure ES-3

LTP Contributions to GHG Emissions Reductions



Where necessary, the Company will seek appropriate regulatory approval(s) for implementation of these initiatives. The start dates for the decarbonization actions are all 2025 or later based on the likely time necessary to obtain regulatory approvals, and design and implement programs or projects.

The largest 2042 emissions reductions result from adding RNG to the gas supply mix and from electrification primarily with hybrid heating systems.

A description of each of decarbonization actions included in National Fuel's LTP, including GHG emissions reductions (in 2042) and total cost (NPV) are presented in Table ES-2.

Table ES-2
Summary of National Fuel's LTP – Decarbonization Actions

	Action	National Fuel's Long-Term Plan	2042 Annual CO2e (000's MT)	Total Cost NPV ($M)
1	**Energy Efficiency**	Implement a residential weatherization program comprised of the most efficient measures with a broader set of measures offered to low- and moderate-income ("LMI") customers and customers in disadvantaged communities. Also implement a weatherization program for small commercial customers and a behavioral program for all residential customers.	(566)	$647
2	**Electrification**	Fully electrify new building construction[11] and convert certain residential customers to hybrid heating systems that provide a reliable, effective, and more affordable source of heating on cold days compared to full electrification. Also electrify the heating systems of small commercial, universities, large multi-family buildings. Conversions of existing buildings may occur either at the end of heating or central air conditioning equipment life and participation increases over time.	(1,237)	$1,247
3	**Industrial Customer Clean Actions**	Reduce process load through energy efficiency programs with custom measures for industrial customers and a separate program to electrify certain non-boiler-based heating systems for industrial customers.	(109)	$73
4	**TENs**	Develop one geothermal network project per year in an existing sub-division starting in 2027.	(6)	$23
5	**RNG**	Promote regional anaerobic digestion projects that produce RNG from landfills, animal manure, food waste, and wastewater facility operations and obtain 100% of RNG within National Fuel's service area as well as smaller amounts of RNG from Pennsylvania and Ohio to blend into the Company's system.	(1,349)	$1,431
6	**Hydrogen**	Blend hydrogen into system supply starting at 0.5% (per Btu) in 2030 and increasing over time to a maximum of 5%.	(339)	$241

[11] Consistent with recent legislation that prohibits the installation of fossil fuel equipment in new construction on or after December 31, 2025 for buildings up to seven stories, and after December 31, 2028 for all new buildings.

In total, the LTP reduces annual 2042 GHG emissions by 3.6 million MT CO2e at a total NPV cost of $3.7 billion, or an average cost of $275 per MT CO2e reduced.

8. The LTP Analysis Establishes the Superiority of a Hybrid Heating Solution (Standard ASHP and Gas Furnace) for National Fuel's Service Area

The scenario analyses indicate that a hybrid system pairing a gas furnace with a standard ASHP is preferred over a full electrification option with a ccASHP from a total cost, cost per emissions reduction, and several other non-cost factors including comfort and reliability. These conclusions are influenced by the extreme weather conditions experienced in National Fuel's service area. In addition, a hybrid heating system that pairs a standard ASHP with a gas furnace has substantially lower up-front installation costs and annual operating costs than when a gas furnace is paired with a ccASHP.[12] Therefore, National Fuel's LTP relies on hybrid heating with a standard ASHP for residential customers that heat with furnaces. Homes currently heating with boilers and older homes are assumed to incur additional costs associated with electrification, implying that electrification programs should focus on newer homes that rely on furnaces as an initial priority. However, consistent with the Guiding Principle that values customer choice, National Fuel will support other electrification choices by customers as well.

9. National Fuel's LTP Addresses Other Key Provisions of the Commission's Gas Planning Order

Demand Response

Demand response programs attempt to shift customer usage patterns to reduce the impact on the system during constrained peak periods. National Fuel observes that it does not have the same demand growth and gas supply constraint concerns as other downstate utilities and has access to more than adequate levels of upstream pipeline capacity to meet peak demands. National Fuel will propose a demand response pilot program to gather the necessary information to determine the cost and effectiveness of demand response programs in its service territory. After additional study, the Company intends to engage with Staff to seek feedback on program design, costs, and potential benefits.

No-Infrastructure Scenarios, NPAs and Leak-Prone Pipe Replacement

National Fuel is distinct in several respects from other natural gas utilities in New York and does not project any pipeline capacity constraints or distribution system delivery constraints during the LTP forecast period. Neither of the two scenarios nor the Final LTP require new infrastructure to meet projected demand, and NPAs and/or demand response or similar

[12] Based on input from stakeholders, National Fuel has performed a sensitivity analysis to test the impact of using ccASHPs to pair with gas furnaces as an alternative hybrid heating system.

initiatives are not necessary to close a gap between demand and supply. As a result, National Fuel's LTP meets the Gas Planning Order's requirement that "LDCs shall be expected to include a 'no-infrastructure scenario' in their long-term plans."[13]

NPAs are potentially relevant in circumstances that do not address a capacity need, including potential avoidance of leak-prone pipe investments. In response to stakeholder feedback, National Fuel has included additional details in the LTP regarding the NPA process as well as the screening and suitability criteria filed with the Commission. Consistent with the Commission's direction in the Gas Planning Order, the Company intends to include in its annual reports – the first of which will be issued on or before May 31, 2024[14] - an approach whereby it will implement its NPA screening and suitability criteria to identify segments of leak prone pipe that can be abandoned in favor of NPAs.[15] The Company will include in this approach consideration of LMI customers and disadvantaged communities, as well as the needs and desires of individual customers affected by proposed NPA options and the impact on energy reliability generally.

LMI Customers and Disadvantaged Communities

The Gas Planning Order in its subsection identified as "Impacts on LMI Customers and Disadvantaged Communities" requires that:

> [I]n their long-term plans, LDCs shall 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.[16]

In accordance with the order, the Company has identified the disadvantaged communities in its service territory and notes that it does not currently have any proposed projects that will disproportionally negatively impact these communities. As it develops pipeline replacement and other potential projects and evaluates proposed NPAs it will include in that analysis how disadvantaged communities may be impacted and consider "special programs for LMI customers or disadvantaged communities" as the Commission encourages in its Gas Planning Order.[17] With respect to clean energy and energy efficiency projects, the Company will determine how the associated benefits will accrue to the disadvantaged communities with a

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13 Gas Planning Order, pp. 36-37.

14 Gas Planning Order, pp. 21-22.

15 The Company's NPA screening and suitability criteria filing remains pending before the Commission. To the extent the Commission directs the Company to modify its criteria, National Fuel will amend and implement the criteria as directed by the Commission.

16 Gas Planning Order, p. 40.

17 Gas Planning Order, p. 39.

focus on achieving no less than thirty-five percent of the overall benefits as directed by the CLCPA.

Cap-and–Invest & Accelerated Depreciation

In June 2023, New York kicked off the initial stage of pre-proposal outreach in connection with the development of a cap-and-invest program, commencing a multi-year process. Although the Department of Environmental Conservation ("DEC") and NYSERDA have not specified when they expect the program will be implemented, they have indicated that it will not take effect prior to 2025. Given this timeline and the current lack of specificity around New York's cap-and-invest program, it is premature to model it in the Company's LTP. National Fuel is following the cap-and-invest development process carefully and will incorporate the resulting program into future LTPs.

Certain stakeholders have also asked that the effects of accelerated depreciation and stranded costs that may allegedly result from a transition away from the use of natural gas be incorporated into National Fuel's LTP. In recent rate proceedings, the Commission has rejected the idea that the CLCPA-mandated reduction of statewide GHG emissions will necessarily require the shortening of asset lives.[18] Additionally, in accordance with the Gas Planning Order, the LDCs have filed depreciation studies with multiple scenarios that examine both the structure of accelerated depreciation and its potential impacts on ratepayers. In its Gas Planning Order, the Commission noted that "[t]hese studies will be able to inform future discussions of how best to recover the costs of assets and reduce potential stranded costs in the LDCs' respective rate proceedings."[19] It would be premature to address these issues prior to receiving the Commission's determination on the pending studies.

10. National Fuel's LTP Meets or Exceeds Each of the Guiding Principles

As summarized in Figure ES-4, National Fuel's LTP strikes an appropriate balance between GHG emissions reductions and costs, as measured by the impact on gas customer bills and the Decarbonization Policy Costs. National Fuel's LTP achieves this balance by prioritizing efficient and effective individual decarbonization actions and derating less effective and more expensive actions while also considering implementation and technological feasibility constraints.

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[18] See, for example, *Order Establishing Rates and Rate Plan,* Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Corning Natural Gas Corporation for Gas Service, Case 20-G-0101 (May 19, 2021)

[19] Gas Planning Order, pp. 61-62.

Figure ES-4
Value Delivered by National Fuel's LTP

1) The LTP prioritizes safety and reliability by diversifying energy sources and continuing the Company's LPP replacement program;
2) The LTP preserves customer choice and provides a more affordable option while relying on the gas system to ensure effective heating during the coldest days and nights of the year;
3) The LTP addresses affordability and reduces energy cost burdens for LMI and other customers, including those that reside in disadvantaged communities;
4) The LTP achieves meaningful reductions in GHG emissions by 2042, prioritizing emissions reductions for LMI customers including those that reside in disadvantaged communities;
5) The LTP is not merely aspirational; it is technically feasible and contemplates technology advances during the 20-year period;
6) The LTP is also feasible from an infrastructure standpoint. It reflects resource and timing constraints related to the conversion of heating and cooling to electricity and the buildout of electric infrastructure to reliably serve incremental demand;
7) The LTP contributes to a resilient energy system that involves coordination between the natural gas and electricity industries; and
8) The LTP is flexible and can adapt as energy technology and policy evolve in the future.

11. National Fuel's LTP Implementation Actions and Next LTP

National Fuel will pursue numerous activities that are designed to develop capabilities and take specific implementation actions related to its LTP.[20] These include:

1. Research:
   - Gather insights from residential and commercial customers to inform the design of programs that contribute to decarbonization of the New York economy;
   - Gather intelligence from industrial customers on decarbonization plans, options, and competitive concerns;
   - Monitor evolution of the RNG and hydrogen markets; and
   - Monitor advances in technology related to heat pumps.

[20] Some implementation actions may be subject to regulatory approval.

2. Design, Propose, and Implement Pilots and Related Programs:
    - Thermal energy network pilots once the site selection processes are completed;
    - ccASHP pilot;
    - Hybrid heating system pilot; and
    - Hydrogen blending pilot.
3. Design, Propose, and Implement Customer and Supply Programs:
    - Energy efficiency and other clean energy programs that deliver benefits to DACs and LMI customers;
    - Gas demand response program;
    - Residential and small commercial weatherization program;
    - Behavioral energy efficiency program; and
    - RNG procurement and cost recovery program.
4. Invest:
    - LPP program in compliance with Commission directives; and
    - Systems and processes necessary to fulfill the Company's commitments to decarbonization, including processes to implement NPAs and obtain hourly information from Supply.
5. Engage, Communicate, and Collaborate With:
    - Stakeholders in the ongoing gas planning process;
    - Customers regarding National Fuel's Final LTP;
    - Industrial customers to understand decarbonization opportunities, plans, and unique challenges; and
    - Electric utilities in National Fuel's service territory regarding opportunities for coordination of planning activities.

National Fuel's next LTP provides an opportunity for a comprehensive refresh of the assumptions, analysis, and recommended plan. The next LTP will include:

- Updates to reflect relevant legislative mandates and final Commission orders;
- Updates to the natural gas demand forecast and gas supply portfolio, including the potential impact of ESCO activities on the supply portfolio;
- Updates on the status of work with National Fuel-Supply to develop procedures to begin to gather and provide hourly throughput data from measurement stations at major

National Fuel citygate locations throughout its service territory and how that hourly data will inform the LTP;

- Evaluation of the cap-and-invest policy impacts to the LTP methodology and updates to assumptions based on market evidence;
- Review of decarbonization action policy assumptions, including technological capabilities, costs to install and operate, and low-carbon fuel prices;
- Updates to all decarbonization action adoption rates to reflect experience over the next three years;
- Updates to electric buildout assumptions to reflect progress toward achievement of CLCPA electric sector emissions targets; an update to the electricity price forecast to reflect the latest information and insights regarding electric distribution and supply costs;
- Enhancements to the electrification adoption methodology and assumptions to reflect study results, NY Clean Heat progress/lessons learned, and other insights;
- Updates to the outlook and potential contribution of alternative sources of RNG;
- Updates to the outlook and potential role of hydrogen; and
- Incorporation of Commission determinations and/or policy decisions that address accelerated depreciation, the recovery of capital costs, and/or the allocation of Decarbonization Policy Costs among funding sources.

National Fuel looks forward to implementing the decarbonization actions articulated in this LTP and is hopeful that the state will view the plan as a model that can be utilized in other regions of the state with similar economic, geographic, and other characteristics as the Company's service territory. The priorities that have guided the development of this LTP - ensuring safe, reliable, resilient, and affordable energy for consumers while preserving emissions reductions options and customer choice - should be reflected in the state's overall decarbonization efforts as well.