BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of

the Rates, Charges, Rules and Regulations of

National Fuel Gas Distribution Corporation

Case 23-G-0627

March 1, 2024

Prepared Testimony of:

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ON BEHALF OF
NATURAL RESOURCES DEFENSE
COUNCIL 40 W 20TH STREET
NEW YORK, NY 10011

CORRECTED Testimony filed March 8, 2024
(correction made to Table 3 on page 32)

1. Introduction and Qualifications

Q. Please state your name, title, and employer.

A. My name is Alice Napoleon. I am a Principal Associate at Synapse Energy Economics, Inc. ("Synapse Energy Economics") located at 485 Massachusetts Avenue, Suite 3, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics is a research and consulting firm specializing in electricity and gas industry regulation, planning, and analysis. Our work covers a range of issues, including economic and technical assessments of demand-side and supply-side energy resources, energy efficiency policies and programs, integrated resource planning, electricity market modeling and assessment, renewable resource technologies and policies, and climate change strategies. Synapse works for a wide range of clients, including state attorneys general, offices of consumer advocates, trade associations, public utility commissions, environmental advocates,

the U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Department of Justice, the Federal Trade Commission, and the National Association of Regulatory Utility Commissioners. Synapse's staff includes over 35 professionals with extensive experience in the electricity and gas industries.

Q. Please summarize your professional and educational experience.

A. Since joining Synapse in 2005, I have provided economic and policy analysis of electric and gas systems and emissions regulations on behalf of a diverse set of clients throughout the United States and in Canada. I have co-authored several reports and comments on the role of energy efficiency in New York State in meeting its Reforming the Energy Vision ("REV") objectives, as well as two white papers on natural gas regulatory reforms needed if New York is to meet its decarbonization targets. I have also provided policy analysis and technical support on issues related to the future of natural gas

utilities in many other states, including Hawaii, Rhode Island, Maryland, Colorado, Massachusetts, Nevada, and California.

I have provided expert advice on demand-side management programs in numerous states and Canadian provinces regarding a range of issues including incentive-setting methodologies, cost-benefit analysis, avoided costs, load forecasting, and locational demand-side management. I also co-authored a manual for regulators on designing performance incentive mechanisms for utilities, which has been highly utilized by many states.

Before joining Synapse, I worked at Resource Insight, Inc., where I supported investigations of electric, gas, steam, and water resource issues, primarily in the context of reviews by state utility regulatory commissions.

I hold a Master’s in Public Administration from the University of Massachusetts at Amherst and a Bachelor’s in Economics from Rutgers

University. My resume is attached as Exhibit AN-1.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Natural Resources Defense Council ("NRDC").

Q. Was this testimony developed by you or under your direction?

A. Yes.

Q. Have you previously testified before the New York Public Service Commission ("PSC" or "Commission")?

A. Yes, I testified in rate cases of Con Edison (Cases 19-E-0065 and 19-G-0066), Niagara Mohawk Power Corporation (Cases 20-E-0380 and 20-G-0381), and The Brooklyn Union Gas Company for Gas Service and KeySpan Gas East Corporation (Cases 23-G-0225 and 23-G-0226) on behalf of NRDC.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to review and critique several of National Fuel Gas's ("Company") proposed gas-side investments as

greenhouse gas ("GHG") mitigation strategies.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes. I am sponsoring the following exhibits:

- Exhibit AN-1: Resume of Alice Napoleon
- Exhibit AN-2: Tables and graphs
- Exhibit AN-3: NFG Responses to discovery cited in this testimony

Q. How is the remainder of the testimony organized?

A. In Section 2, I provide a summary of my conclusions and recommendations. Section 3 describes the policy background for this rate case and a high-level overview of the Company's decarbonization strategy and related proposals made in this rate case. Section 4 describes how this strategy and these proposals are inconsistent with the Climate Leadership and Protection Act ("CLCPA" or "the Act").

2. Summary of Conclusions and Recommendations

2.1. Summary of Conclusions

Q. Please summarize your conclusions.

A. My conclusions are summarized as follows:

- NFG's proposals for leak-prone pipe ("LPP") replacement and for a hybrid heating pilot would create large increases in rate base. The resulting massive undepreciated balances will burden ratepayers for many years to come and are likely to disproportionately impact the most vulnerable customers.
- NFG's approach to decarbonization is inconsistent with the CLCPA. NFG's decarbonization strategy focuses on investment in and reliance on the current gas system and delivery of alternative gaseous fuels. These would extend reliance on the gas system and on combustion as a source of heating for buildings, even as New York is committed to reducing GHG emissions statewide to net-zero by 2050 and reducing harmful co-pollutants, especially in disadvantaged communities.

2.2. Summary of Recommendations

Q. Please summarize your recommendations.

A. My recommendations are summarized as follows:

- The PSC should approve neither NFG's proposed LPP replacement program, nor the Hybrid Heating, renewable natural gas (RNG), and certified gas pilots.
- The PSC should direct NFG to investigate pipe retirement without replacement in areas with redundancy (pipe on both sides of the street).
- The PSC should order NFG to pursue NPAs wherever feasible and to develop a detailed, clear framework for prioritizing LPP for replacement vs. for retiring and taking out of service. That framework should consider the costs over the actual useful life of the proposed traditional infrastructure investment.

3. Background and Overview of Filing

3.1. Policy Background

Q. Please describe New York's energy and climate policies relating to electric and gas utilities.

A. Passed in 2019, the CLCPA calls for ambitious, economy-wide clean energy, co-pollution reduction, and climate targets. The Act requires a 40 percent reduction in GHG emissions from 1990 levels by 2030 and an 85 percent reduction by 2050 across all sectors of the state's economy. It also sets a goal for the state to achieve net-zero GHGs by 2050, which means all remaining emissions (above the required 85 percent reduction) must be offset.

The Act established a Climate Action Council (CAC) tasked with preparing a Scoping Plan to serve as the roadmap to achieve the Act's targets and policy objectives. To assess different pathways for achieving these emissions reduction goals, the New York State Energy Research and Development Authority (NYSERDA) and the Department of Environmental Conservation

(DEC) commissioned modeling of the statewide and economy-wide benefits, costs, and GHG emissions reductions of scenarios to achieve the CLCPA emission limits ("Integration Analysis"). The Integration Analysis identified that widespread building electrification, decarbonized electricity, and aggressive energy efficiency measures are essential for New York to meet the CLCPA targets and policy objectives. Informed by the Integration Analysis, the Scoping Plan identified that the vast majority of current fossil gas customers (residential, commercial, and industrial) need to transition to electricity by 2050 and identified statewide fossil gas use reductions of at least 33 percent by 2030 and by 57 percent by 2035. The Scoping Plan also dedicates a full chapter on recommendations for a well-planned, strategic downsizing of the gas system to manage the gas system transition.

On March 19, 2020, the PSC issued the Order Instituting Proceeding to open Case No. 20-G-

0131 ("Gas Planning Proceeding") to "establish planning and operational practices that best support customer needs and emissions objectives while minimizing infrastructure investments and ensuring the continuation of reliable, safe, and adequate service to existing customers" (Order Instituting Proceeding at 4). In the same proceeding, on May 12, 2022, the Commission released the Order Adopting Gas System Planning Process (Planning Order), which requires the gas utilities to file long-term plans ("LTP") every three years and file annual reports in interim years.

Q. Please describe the Planning Order.

A. The Planning Order requires utilities to include analyses considering energy efficiency and Non-Pipeline Alternatives ("NPA") in their long-term plans. Specifically, utilities must include an NPA-only (no new gas infrastructure) scenario unless they can present sufficient evidence that such a scenario is infeasible. According to this order, alternatives must be compared based on

benefit-cost analysis, bill impact analysis, and emissions impacts.

The order also requires the gas utilities to file depreciation studies that include the following scenarios:

- Full depreciation of all new gas plants installed beginning in 2022 by 2050,
- Full depreciation of all gas plants by 2050, and
- 50 percent of customers leave the gas system by 2040 and only 10 percent remain by 2050.

Q. Please describe the order on CLCPA Implementation.

A. Also on May 12, 2022, the PSC issued the Order on Implementation of the Climate Leadership and Community Protection Act ("CLCPA Implementation Order") in Case No. 22-M-0149. The CLCPA Implementation Order covers several directives. This order requires that the gas utilities propose a study to analyze the scale, timing, costs, risks, uncertainties, and bill impacts

associated with pathways to significant reduction in GHG emissions. As required in the CLCPA Implementation Order, this analysis must include (1) a coordinated long-term gas sector decarbonization pathway analysis through 2050, (2) coordinated near-term plans to address actions needed to achieve statewide decarbonization targets through 2030, and (3) individual utility plans to achieve each utility's share of emissions reductions through 2050 (p. 26-27).

3.2. Overview of Company Filing

Q. Please provide an overview of the Company's filing in this rate case.

A. NFG filed an initial request of $88.8 million (Revenue Requirement Panel testimony (RRP), p. 5). According to the filing letter accompanying the initial filing, this request represents a 30.8 percent increase in base delivery revenues and an 11.1 percent increase in total revenues for the rate year ended September 30, 2025. The Company projected that this request would result

in sizeable customer bill increases, including a 29.3 percent increase in the monthly delivery bill and a 13.7 percent increase in total monthly bills. In this request, the Company articulated its plans to heavily invest in replacement of its LPP, which drives an increase to rate base, as costs per mile of replacement have increased with labor and materials costs. The LPP program, discussed further below, is a significant driver of the overall increase request. NFG indicated that this increase will enable the Company to continue investing in its system and its needs, address increased costs as a result of inflation, and implement its Long-Term Plan to advance CLCPA goals.

On January 12, 2024, NFG filed updates to its filing. According to the updated RRP testimony, this update requests an increase in annual revenues of about $88.6 million (p. 3). It does not appear that NFG filed a revised version of revenue and bill impacts to go along with the updated revenue request.

Q. Please describe NFG's decarbonization strategy.

A. NFG outlined its decarbonization strategy in its Final LTP that it submitted in Case 22-G-0610 pursuant to the Planning Order. The Company referenced its LTP throughout its testimony in this rate case and attached it as an exhibit to the CLCPA Panel testimony. In the CLCPA Panel testimony, the Company asserted that its final LTP is projected to reduce "value chain" emissions, which include imported, direct, and end-user emissions, from 1990 levels by 53 percent by the end of the plan's 20-year horizon (p. 56). The Final LTP focuses on infrastructure investments to reduce emissions, notably replacing LPP. The LTP assumes a large share of emissions reductions resulting from affordability- and reliability-focused electrification primarily with hybrid heating systems. (Hybrid heating systems use heat pumps in addition to another heating source.) The Final LTP also includes the incorporation of RNG into its system as a key strategy.

Q. Did the Commission adopt NFG's LTP?

A. No, in its December 14, 2023 order, the Commission declined to adopt NFG's LTP, noting that it fell short of the intent of the Commission's Planning Order in several instances (Planning Order at 21). Instead, the Commission required NFG to take a variety of actions and to provide additional information in its Annual Updates to the LTP as well as in its next full LTP, which must be filed by December 15, 2026 (Order Implementing Long-Term Natural Gas Plan with Modifications, Case 22-G-0610, at 21-22).

Q. Please describe NFG's proposals in this rate case that relate to its decarbonization strategy.

A. In this rate case, the Company proposes several measures that it claims will reduce emissions. These include replacement of LPP on its system and a hybrid heating pilot. It will also focus on developing "low carbon" fuel projects (e.g, RNG, hydrogen, and certified gas) and developing new technology that it hopes will reduce

emissions (such as carbon capture utilization and storage (CLCPA Panel Testimony, p. 17-18).

The Company identified the emissions reductions associated with these decarbonization initiatives over the course of the rate year ending September 30, 2025: 25,941 MT CO2e from LPP replacement, 32,851 MT CO2e from the Hybrid Heat Pilot, 14,544 MT CO2e from the RNG pilot, and 5,462 MT CO2e from the certified gas pilot (CLCPA Panel Testimony, p. 57).

4. Several of NFG's Proposals and Programs Are Inconsistent with the CLCPA

Q. Do you have concerns with NFG's proposals for investments in the gas system?

A. Yes. I am concerned that some investments are unnecessary, high-cost, and will extend reliance on the gas system. NFG's approach would retain and continue investment in the gas system as it is now, rather than planning for compliance with the CLCPA, in a manner consistent with the Scoping Plan. The specific proposals I am concerned with include the Company's proposed

LPP Program, Hybrid Heating Pilot Program, RNG pilot, and certified gas pilot.

4.1. Leak-Prone Pipe Replacement

Q. Please describe the Company's Leak-Prone Pipe (LPP) Replacement Program.

A. According to NFG, 1,283 miles of NFG's distribution system are considered leak-prone (Infrastructure and Engineering Panel (IEP) testimony, p. 13). The Company proposes to replace LPP at a rate of 110 miles per year, at a minimum, until all of its leak-prone pipes are replaced in 2035 (CLCPA Panel testimony, p. 20). The Company has been investing in systematic pipe-replacement since the mid-1990s, but in recent years costs have increased. From 2018 to 2023, the LPP cost per mile increased by 56 percent (CLCPA Panel Testimony; Exhibit AN-3: NFG Supplemental Response to NRDC-15 Attachment 1). With the passage of the New York State Roadway Excavation Quality Assurance Act, the Company estimates the cost per mile for LPP distribution work in fiscal year (FY) 2024 to be

approximately $737,000 per mile, an increase of 35 percent above FY 2023 LPP cost per mile (Exhibit IEP-8 Update). Despite these cost increases, the Company is not proposing any adjustment in its rate of LPP replacement in this filing (CLCPA Panel Testimony, p. 20).

Over 70 percent of the Company's proposed capital expenditures are directed towards its LPP Replacement Program (IEP Testimony, p. 9 lines 14-15). Table 1 (available in Exhibit AN-2, Table 1) shows NFG's proposed total and LPP capital budget for each rate year. The majority of the $375 million LPP Replacement capital budget ($338 million) is for replacement of distribution mains and services (Exhibit IEP-4 Update, p. 1 of 3).

Table 1. LPP Replacement and total capital budget per year

Project/Program	**FY 24**	**FY 25**	**FY 26**	**FY 27**	**Total**
LPP – Total Capital (*$Millions*)	$86.2	$92.6	$96.0	$100.3	**$375.2**
Total Capital Budget (*$Millions*)	$125.5	$123.4	$119.8	$123.9	**$492.5**

Source: Exhibit IEP-4 Update.

Q. Is the Company employing additional or alternative programs to address LPP?

A. No. The Company proposed NPA suitability and screening criteria in Case 20-G-0131; however, these are still pending before the Commission. The Company states that it plans to "take into account the use of Non-Pipe Alternatives to avoid LPP replacement" (IEP Testimony p. 19 lines 4-6) and will "implement its NPA screening and suitability criteria to identify segments of LPP that can be abandoned in favor of NPAs" (CLCPA Testimony p. 48 lines 8-10). However, the Company has not said whether it will commit to pursuing NPAs for all segments of LPP that meet the NPA screening and suitability criteria, which would align the Company's approach to LPP with strategies needed to attain CLCPA goals, rather than just committing to considering NPAs (Exhibit AN-3: NFC Response to NRDC-17). Furthermore, when asked whether the Company has completed or commissioned any analysis comparing the cost of emissions reductions from the LPP

program compared to NPAs, the Company replied: "The Company has not commissioned an analysis as described in the question because such an analysis would not be useful given the fact- and context-dependent nature of NPA projects/programs that necessarily rely on specific geographic, facility, customer factors and/or information"(Exhibit AN-3: NFG response to NRDC-13).

NFG's lack of commitment to pursuing NPAs is concerning, especially in light of the Commission's Order in Case 22-G-0610 on NFG's LTP. This order requires NFG to employ a procurement process to pursue NPAs for at least two capital projects (infrastructure upgrades or main extension projects) planned for calendar year 2025 with project costs greater than $1 million (p. 62).

Q. What claims does the Company make about its LPP Program's impact on emissions?

A. The Company includes the LPP program in its portfolio of initiatives for CLCPA compliance.

As detailed in Attachment 1 to DPS-459, the Company estimates the program will reduce 155,649 metric tons of carbon dioxide equivalent (CO2e) emissions from 2025-2027. The Company has not provided or commissioned any analysis to support why LPP replacement is a cost-effective way to reduce GHG emissions, relative to electrification and pipeline retirement (Exhibit AN-3: NFG response to NRDC-29).

Q. Is the Company looking to fully decommission any pipe through this program?

A. No. The Company does not have specific goals for retiring any pipe without replacement and, in its planning, does not even differentiate between “replaced” and “retired and replaced” (Exhibit AN-3: NFG Response to NRDC-6). NFG has only retired 21.9 miles of LPP without replacement since 2018 (which is less than 4 percent of the total LPP retired over that time period) (Exhibit AN-3: NFG Response to NRDC-6 Attachment 1).

Q. Does NFG have opportunities to reduce investment in LPP replacement?

A. Yes. As just one potentially ripe area for reducing LPP investment, much of NFG's system is redundant because mains are typically installed on both sides of the street. This redundancy represents an opportunity for NFG to abandon pipe that should be further explored. Despite this, NFG says that it has not identified specific areas to abandon pipe where pipe is in place on both sides of a single street and does not necessarily prioritize targeted pipe abandonment in these locations (Exhibit AN-3: NFG response to NRDC-19).

In NFG's response to NRDC-18, Attachment 1 (Exhibit AN-3: NFG response to NRDC-18), the Company provides a preliminary list of locations that NFG identified and planned to further evaluate for potential NPAs. These locations add up to only 8.54 miles, serving 26 existing customers. As noted previously, the Company states that it has prioritization criteria for

choosing NPA investments but does not specify if it will commit to pursue any NPAs, rather than committing to considering NPAs (Exhibit AN-3: NFG response to NRDC-17). Again, NFG's proposed NPA suitability criteria are still pending before the Commission in Case 20-G-0131.

Q. What would be the utility's assumed useful lifetime for LPP program assets installed during the rate term?

A. NFG proposes using a 65-year average lifetime for depreciation of plastic mains, and a 60-year average lifetime for depreciation of services (Spanos Exhibit – 2023 Depreciation Study, p. II-37 and II-42).

Q. If depreciation rates are not changed, how much of the LPP investments from the next four years will remain undepreciated plant balance in 2050?

A. To answer this, Synapse analyzed the depreciation, taxes, and return to investors associated with LPP investments over the rate period, using a modified version of a spreadsheet tool published by Con Edison in Case

No.14-E-0302. Of the $338 million that NFG proposes to spend on LPP mains and services in 2024 through 2027, this analysis indicates that there will be an undepreciated balance of more than $141 million (approximately 42 percent) in 2050, when New York is committed to be net-zero emissions.

Q. What would be the resulting impact on revenue requirement due to LPP investments over the next four years?

A. Based on this analysis, I find that immediately after the investments from 2024 through 2027 are in rate base, the annual revenue requirement from these investments alone would be more than $42 million. In 2050, the revenue requirement associated with these investments is projected to be more than $21 million per year. The cumulative revenue requirement for these $338 million in investments over their lifetime totals about $1.17 billion, of which over $387 million (about 33 percent) would not yet have been received as of 2050.

Q. What concerns do you have about a large undepreciated plant balance for NFG in 2050?

A. Gas system assets have very long physical useful lifetimes—generally 60-80 years—and are depreciated over a similar timeframe. Yet to be consistent with the requirements of the CLCPA, as reflected in the Scoping Plan's Integration Analysis, the useful life of these assets is distinctly shorter than their physical life. When evaluating alternatives to long-lived investments, it is important to account for cost recovery over a shorter period of time when considering impact on rates and competitiveness. Undepreciated assets that are underutilized or no longer serving customers run the risk of becoming stranded, especially as rates rise in response to declining sales and drive customers off the system. In turn, reductions in load and customer defection from the gas system would escalate costs for remaining customers. This process is likely to greatly increase burdens for those that are disproportionately vulnerable

or disadvantaged, who generally face greater challenges with electrifying their end-uses.

Q. Has NFG accounted for the impacts of the CLCPA and the Planning Order on depreciation rates in this case?

A. No. NFG has not demonstrated how its proposed investments in LPP replacement (or in hybrid heating, as I discuss below) will be worthwhile over their full lifetime and how the Company will mitigate resulting stranded cost risks. In fact, the depreciation studies presented in this rate case as exhibits to Witness Spanos' testimony do not consider potential impacts of the CLCPA. Further, "the Company is not proposing any CLCPA-related depreciation changes at this time" (Direct Testimony of John J. Spanos, p. 4).

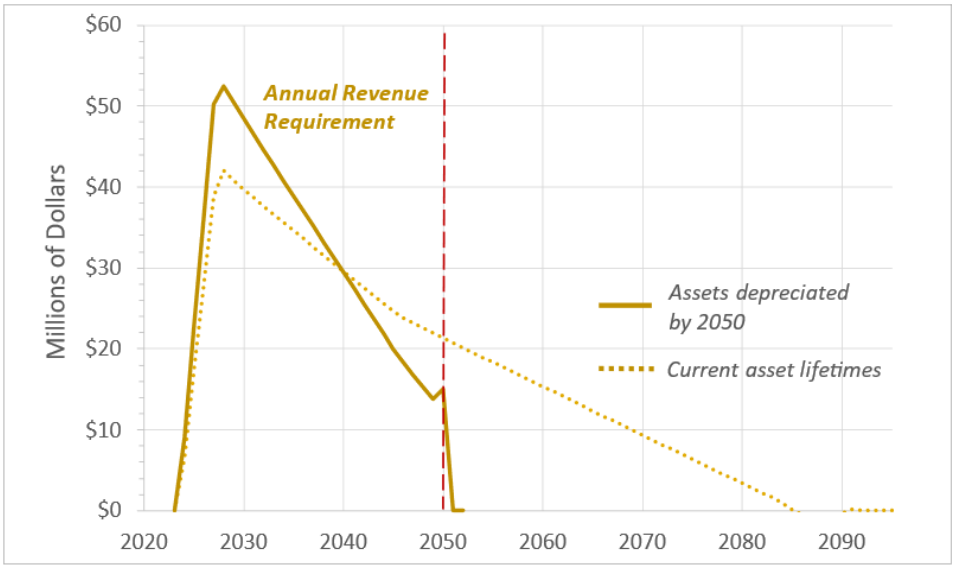
The Company states that these considerations are expected to be addressed in the generic Gas Planning Proceeding in Case 20-G-0131. The Planning Order required the utilities to conduct depreciation studies with

three scenarios: (1) a scenario that fully depreciates all new gas plant installed beginning in 2022 by 2050, (2) a scenario that fully depreciates all gas plant by 2050, and (3) a scenario that assumes 50 percent of gas customers exit the system by 2040 and 10 percent remain after 2050. In comparison, the depreciation studies presented in this rate case do not incorporate any of those scenarios and instead reflect a business-as-usual approach. Witness Spanos notes that the CLCPA will likely impact the gas industry and result in a shorter life cycle for many of the asset classes, but these impacts are not included in the depreciation studies presented in this rate case (Direct Testimony of John J. Spanos, p. 4). Further, in the Company's response to NRDC-67, NFG states that it is "premature" to consider these potential impacts of the CLCPA on depreciation on NFG's gas capital planning in this proceeding (Exhibit AN-3: NFG Response to NRDC-67).

Q. What would the impact on revenue requirement be if the LPP investments were fully recovered by 2050?

A. Synapse modeled an alternative scenario where the lifetimes of LPP investments are shortened such that they are fully depreciated by 2050 to align with the CLCPA. As shown in Figure 1 (Exhibit AN-2, Figure 1), this analysis calculated the future revenue requirement associated with replacing LPP mains and services for 2024 through 2027 under current and shortened asset lifetimes, consistent with the timeline for emissions reductions required by the CLCPA. While the annual revenue requirement would be higher in the near term, the cumulative revenue requirement for these $338 million in investments would only be $846 million, half as much as the cumulative revenue requirement using depreciation schedules based on current average asset lifetimes.

Figure 1. Annual revenue requirement for 2024-2027 LPP mains and services investments under current and shortened asset lifetimes



Q. What do you suggest the Company change about its approach to LPP given the high cost of replacement and redundancy in the Company's system you have detailed?

A. To avoid large undepreciated balances in 2050, NFG should seek alternatives to LPP investment, such as non-pipe alternatives.

Q. How should NFG evaluate the cost-effectiveness of NPAs compared to traditional pipeline investments?

A. For the purposes of a benefit-cost analysis comparing LPP replacement or other pipeline

investments to an NPA, NFG should compare the annual cost of the NPA to the 60- or 65-year life annual carrying costs of the pipeline solution. For example, for NFG's total proposed LPP distribution mains investment of $45.8 million in FY2024, the annual average carrying cost over the 65-year life of these pipes would be 9.8 percent of the total $45.8 million investment per year, or $4.5 million, as shown in Table 2 (Exhibit AN-2, Table 2). Thus, the annual avoided cost of not replacing the FY2024 miles of LPP is $4.5 million per year. So, if NPAs were pursued instead of LPP, the NPA solutions would be cost-effective if the total annual cost is less than $4.5 million per year. However, if the useful life of LPP replacement installed in 2024 ends in 2050, and it is depreciated over the same time period, the annual average carrying cost for this pipe would be 11.9 percent, or $5.5 million per year. Thus, with this shorter lifetime, an NPA with an annual average cost below $5.5 million would be

a cost-effective alternative to LPP investment.

Table 2. Annual average carrying cost for NFG's total LPP distribution mains investment for FY2024 under different depreciation regimes

Installed year and lifetime	Annual average carrying cost (%)	Annual average carrying cost ($)
2024, 65-year life, retire in 2089	9.8%	$4,503,122
2024, 26-year life, retire in 2050	11.9%	$5,482,526

Of course, this represents the overall potential annual avoided costs from forgoing the total proposed LPP replacement in 2024. Pursuit of NPAs would avoid some but potentially not all of these LPP investments. Table 3 (Exhibit AN-2, Table 3) shows the annual average carrying cost for each year of pipeline installation under the different depreciation regimes I present here. So for example, if a hypothetical LPP main replacement project costs $1 million in 2024 and has a 65-year life, the annual average carrying cost would be 9.8 percent of $1 million, or $98,000. Thus, it would be cost-effective to pursue an NPA for that project if the annual cost of that NPA is less than $98,000. However,

for a $1 million investment in pipe assumed to be depreciated by 2050, for a cost-effectiveness decision in 2024, the annual average carrying cost is instead 11.9 percent, or $119,000 annually. Thus, an NPA would be more cost-effective than a $1 million LPP investment if the annual cost of the NPA is less than $119,000. In 2027, if you had the same $1 million LPP investment, an NPA for less than $126,000 would be cost-effective. As these factors will only increase the closer we get to 2050, there will come a time when almost any new pipe replacement will not be cost-effective compared to NPAs.

Table 3. Annual average carrying cost for a $1 million LPP main investment under current and shortened depreciation regimes

Lifetime	**Annual average carrying cost (%)**	**Annual average carrying cost ($)** *(per $1M investment)*
2024, 65-year life	9.8%	$98,084
2024, retire 2050	11.9%	~~$97,692~~ $119,416
2025, retire 2050	12.1%	~~$119,416~~ $121,328
2026, retire 2050	12.3%	~~$121,328~~ $123,439
2027, retire 2050	12.6%	~~$123,439~~ $125,777

Q. What do you suggest the Company change about its approach to LPP?

A. NFG should consider the costs over the actual useful life of the assets installed in the LPP program when making cost-effectiveness decisions for NPA consideration.

Also, NFG should more aggressively identify and pursue opportunities to retire and remove pipe rather than replacing it. As one example of low-hanging fruit, NFG should prioritize parts of its system with redundancy.

Throughout its system, NFG should aggressively pursue NPAs. Further, the annual budgets and targets for LPP replacement in this case should be reduced substantially, to only cover the highest risk segments of LPP (e.g., including but not limited to those with active leaks), and all LPP replacement scheduled for 1-2 years or further out in time should be screened for cost-effective NPAs. Generally, NFG should take a more prudent approach, that is to defer as much proactive LPP replacement as is

consistent with safe and reliable service until the company has done a fuller assessment of how to downsize its system consistent with CLCPA targets and implements a meaningful and robust NPA processes.

4.2. Hybrid Heating

Q. What is the Company proposing with respect to hybrid heating?

A. The Company is proposing a Hybrid Heating Pilot program that will offer gas furnace and air-source heat pump rebates for participating customers. Incentives will be available for standalone cold-climate air-source heat pumps (ccASHPs), ccASHPs in locations with an existing natural gas furnace, air-source heat pumps (ASHPs) paired with an existing natural gas furnace, and ductless mini-split heat pumps in locations with an existing boiler (CLCPA Panel testimony, p. 41). The Company requests $46,949,000 in funding for this program (ESSP Exhibit p. 3). The Company calculated the emissions reductions of this pilot program to be

242,143 metric tons of CO2e over the 2025-2027 period (CLCPA Panel testimony, p. 58).

Q. Do you have concerns about relying on hybrid heating as a decarbonization strategy?

A. Yes. I have concerns with this strategy, and with the proposed pilot, for a variety of reasons. Promoting a hybrid heating approach simply continues reliance on gas space heating equipment. Installing new gas-fueled furnaces and boilers which have a lifetime of 15-20 years will lock in natural gas usage for more than the next decade. Furthermore, reliance on hybrid gas heating as a decarbonization strategy will require continued investments in the gas system as pipes that are currently in good condition age or are damaged. Such a strategy poses risks, as it will make it more difficult to downsize the system later on.

Q. Do you have concerns about the Company's assumptions underlying its proposed hybrid heat program?

A. Yes. The Company uses several unreasonable

assumptions regarding this proposed program, or it fails to provide these assumptions. These include heat pump assumptions relating to switchover temperatures, measure costs, and interaction with electrification rebates through the Inflation Reduction Act and NYS Clean Heat Program. Many program details are undecided and will be included in the Company's Hybrid Heating pilot project proposal due to be filed by June 30, 2024 (Exhibit AN-3: NFG Response to NRDC-41). For example, the Company intends to allow customers to determine the switchover temperature for their hybrid heating system, as long as it falls below a yet-to-be-determined maximum switchover temperature (NRDC-40). The cost-effectiveness of this program is unclear; the Company does not provide measure costs, incremental costs, or a benefit-cost analysis. Reliance on a hybrid heating approach, as opposed to a full electrification approach should be supported by a benefit-cost analysis that includes impacts to the gas and electric

system.

Further, the pilot could be an impediment to implementing NPAs in pilot areas.

Q. Aside from the concerns about the purpose of the proposed hybrid heating pilot, is it appropriate to include costs for such a program in rate base?

A. No. The PSC's order on NFG's LTP directed the Company to conduct a pilot to test hybrid heating options that include both cold climate and standard heat pumps and a second pilot on cold climate heat pumps with only electric resistance heating (Case 22-G-0610, p. 63).

Given the directives in this order, it is not appropriate to propose this pilot in the rate case, because a version consistent with the Commission's directives will be considered in the LTP docket.

Q. What do you conclude with respect to NFG's pilot for hybrid heating?

A. The lack of clear, justified assumptions and design of this program do not provide a

reasonable basis for approving this program. Further, reliance on hybrid heating is a problematic decarbonization strategy given the timeline required by the CLCPA for achieving net-zero emissions.

4.3. Renewable Natural Gas

Q. What is RNG?

A. RNG is pipeline-quality gas derived from biomass or other renewable resources. Once processed, it is interchangeable with conventional fossil gas, meaning it can be delivered in the same pipes and combusted in the same appliances.

Q. What is the Company proposing with respect to RNG?

A. The Company is proposing a three-year RNG pilot program. For the program, NFG proposes to purchase the gas and the associated environmental attributes of RNG and retire the environmental attributes. The Company assumes that it will purchase 200 Dth/day of RNG at a capped cost of $2,000,000 annually, meaning it assumes a purchase rate of $40.05 per Dth for

the gas and environmental attributes (Exhibit AN-3: NFG Response to DPS-406, Attachment 3).

Q. Why is the Company investing in this RNG pilot?

A. The Company is proposing the RNG pilot program as one of its emissions reductions initiatives to achieve CLCPA targets (CLCPA Panel testimony, p. 49). The Company says that using RNG instead of conventional gas will reduce emissions because RNG production requires methane capture and will prevent its release into the atmosphere. The Company estimates that the program will reduce 14,544 metric tons of CO2e each year.

Q. Do you have concerns about relying on RNG as a decarbonization strategy?

A. Yes. RNG supply is limited and is projected to remain limited. RNG also costs far more than fossil gas—on the order of 10-20 times more, based on gas price data for February 2024 —and represents an expensive alternative. As NFG and other utilities and jurisdictions increase their investment in these fuels, already high prices

will likely rise, and supply constraints will pose a risk.

As with the other NFG decarbonization proposals I discuss, investing in RNG prolongs investment and reliance on the gas system. Such a strategy is inconsistent with the CLCPA targets, which the Integration Analysis found would require downsizing the gas system to achieve.

RNG, similar to conventional fossil gas, carries the risk of emissions from potential leaks in the distribution system and at customer sites. It also produces co-pollutants when combusted. Moreover, the feedstocks and production of RNG can lead to further fugitive methane emissions and environmental harm. Given these concerns, the reliance on RNG raises significant questions about its impact on both indoor and outdoor air quality. This is particularly relevant because the CLCPA, in Section 7(3), mandates that the Commission regulate gas utilities with a priority on

reducing GHG emissions and co-pollutants, especially in disadvantaged communities.

Q. Do you have concerns about the proposed RNG pilot?

A. Yes. In addition to the concerns I raise above about RNG as a decarbonization strategy, NFG has not provided or performed any analysis comparing the costs of its proposal to blend RNG compared with implementing NPAs, such as targeted electrification (NFG Response to NRDC-29). NPAs such as standalone electrification are likely more in line with the CLCPA targets and could be more cost-effective. Considering NPA is particularly important if accessing RNG supply would require capital expenditures. To the extent there are RNG interconnection costs, these costs should fall on the RNG supplier and be folded into the supply price, rather than be subsidized by existing customers.

Q. Do you have concerns about the Company's assumptions related to RNG?

A. Yes. NFG is using the most optimistic emissions

factor and feedstock, by assuming that animal manure is the RNG feedstock and has a lifecycle carbon intensity of -281.8 lb/Mcf. While NFG has focused its discussion of potential RNG procurement to RNG sourced from animal manure feedstocks, NFG does not state whether it proposes to procure animal waste feedstock RNG exclusively. However, the carbon intensity of RNG varies substantially depending on its feedstock, production methods, location of production, and how the fuel is transported to the point of injection into the distribution system. While reductions in carbon emissions are possible for some types of RNG (such as RNG produced from animal manure), other, more plentiful types might or might not reduce emissions, and likely not at the rate NFG assumes. For example, in a study conducted for the American Gas Foundation, ICF found that RNG from food waste will produce only moderate emissions savings in the Mid-Atlantic region, accounting for emissions prior to injection into

the distribution system.

Moreover, RNG is not inherently environmentally friendly due to potential harmful impacts from certain feedstocks and leakage rates. When assessing the environmental benefits of biomethane, it's crucial to consider the entire lifecycle emissions from various feedstocks. Biomethane is often considered “zero carbon” as it originates from organic material that has absorbed atmospheric carbon and would release this carbon during natural decomposition. However, a comprehensive climate impact assessment of biomethane should include the energy required for production, whether the source generates new methane, and the extent of methane leakage during production and distribution. Given methane's high short-term global warming potential—over 80 times that of carbon dioxide—and the CLCPA's requirement to factor in both the 20-year and 100-year global warming potentials, methane leakage poses a significant near-term climate concern.

Q. What do you conclude with respect to NFG's proposed use of RNG?

A. A decarbonization strategy that relies heavily on RNG for widespread use is problematic and inconsistent with the CLCPA. Further, the proposed pilot lacks details and is not supported by analysis comparing cost of emissions reductions from RNG blending compared to NPAs.

4.4. Certified Gas

Q. What is certified gas?

A. According to the Company, certified natural gas is "natural gas that has been evaluated and verified by an independent third-party to have been produced with reduced GHG emissions and environmental impacts, beyond current environmental regulations" (GSA Panel, p. 34).

Q. What is the Company proposing with respect to certified gas?

A. The Company is proposing a three-year pilot program for the procurement of certified gas. According to the CLCPA Panel testimony, the

pilot will limit the incremental cost associated with certified gas premiums above traditional, fossil supplies to $300,000 per year (p. 49).

Q. Why is the Company investing in this certified gas pilot?

A. The Company is proposing the certified gas pilot program as one of its emissions reductions initiatives (CLCPA Panel testimony, p. 49). The Company states the purpose of CNG programs is to "incentivize continuous improvement in methane emissions monitoring and abatement by creating an opportunity for producers to differentiate their natural gas production by its methane emissions performance" (GSA Panel testimony, p. 34). CNG Pilot Program will purchase certified natural gas that has obtained either the MiQ rating or Oil and Gas Methane Partnership 2.0. The Company claims that certified gas reduces methane [leakage?] up to 80 percent compared to traditional wells (CLCPA Panel, p. 49 lines 11-12). The emissions reductions presented in CLCPA Panel testimony assume procurement of 20,000 Dth

per day of gas with a certified methane intensity of 0.05 percent (MiQ Grade A), compared to the emissions of typical gas produced in the Appalachian basin (based on NETL 2022 emission factors). The Company estimates the anticipated emissions reductions associated with the certified gas pilot to be 5,462 MT CO2e per year, for a total of 16,386 MT CO2e reduced over the three rate years (CLCPA Panel, p. 48). This represents only a 1.2 percent decrease from the emissions of an equivalent volume of non-certified gas (Exhibit AN-3: NFG Response to DPS-417).

Q. Do you have concerns about investing in certified natural gas as a decarbonization strategy?

A. Yes. There are many issues with relying on certified gas as a CLCPA compliance strategy. The potential for emissions reductions from certified gas is limited since it will still release GHG emissions during combustion. Furthermore, as with RNG, certified gas still

emits methane leaks from the distribution system, and criteria pollutants when burned. Also, significant dependence on certified fossil gas by utilities may prolong dependence on the gas system and will not be a viable CLCPA compliance strategy in the long term.

Moreover, certified gas is not regulated. There are no official standards to verify that certified gas provides incremental benefits above what is already occurring in the industry. Lack of standards and transparency make it difficult to verify whether the emissions reductions from certified gas are additional (i.e. they would not occur without the certification). Moreover, any environmental benefits from this fuel may be superseded by federal regulations. The U.S. Environmental Protection Agency recently released new regulations for the oil and gas industry requiring reductions in fugitive emissions from wells and transmission and distribution systems. These standards may reduce or eliminate the

claimed environmental benefits from certified fossil gas.

Q. What do you conclude about the proposed certified gas pilot?

A. The certified gas pilot is premature and should be rejected. Based on the points above, I find that certified gas does not represent a valid GHG reduction measure at this time, and thus it is not consistent with the CLCPA. While NFG only proposes a pilot for certified gas in this proceeding, directing funds and time to this pilot will drive costs increases without associated benefits to customers. As a larger decarbonization strategy, certified gas is likely to jeopardize CLCPA compliance.

Q. Does this conclude your direct testimony?

A. Yes, it does.