

**Before the
New York Public Service Commission**

Proceeding on Motion of the Commission as to)
the Rates, Charges, Rules and Regulations of) Case 23-G-0225
The Brooklyn Union Gas Company d/b/a National)
Grid NY for Gas Service)

Proceeding on Motion of the Commission as to)
the Rates, Charges, Rules and Regulations of) Case 23-G-0226
KeySpan Gas East Corporation d/b/a National)
Grid for Gas Service)

**DIRECT TESTIMONY OF
ALICE NAPOLEON**

**ON BEHALF OF
NATURAL RESOURCES DEFENSE COUNCIL**

September 1, 2023

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1 **1. INTRODUCTION AND QUALIFICATIONS**

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

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

6 **Q. Please describe Synapse Energy Economics.**

7 A. Synapse Energy Economics is a research and consulting firm specializing in
8 electricity and gas industry regulation, planning, and analysis. Our work covers
9 a range of issues, including economic and technical assessments of demand-
10 side and supply-side energy resources, energy efficiency policies and
11 programs, integrated resource planning, electricity market modeling and
12 assessment, renewable resource technologies and policies, and climate change
13 strategies. Synapse works for a wide range of clients, including state attorneys
14 general, offices of consumer advocates, trade associations, public utility
15 commissions, environmental advocates, the U.S. Environmental Protection
16 Agency, U.S. Department of Energy, U.S. Department of Justice, the Federal
17 Trade Commission, and the National Association of Regulatory Utility
18 Commissioners. Synapse’s staff includes over 35 professionals with extensive
19 experience in the electricity industry.

1 **Q. Please summarize your professional and educational experience.**

2 A. Since joining Synapse in 2005, I have provided economic and policy analysis
3 of electric and gas systems and emissions regulations on behalf of a diverse set
4 of clients throughout the United States and in Canada. I have co-authored
5 several reports and comments on the role of energy efficiency in New York
6 State in meeting its Reforming the Energy Vision (“REV”) objectives, as well
7 as two white papers on natural gas regulatory reforms needed if New York is
8 to meet its decarbonization targets. I have also provided policy analysis and
9 technical support on issues related to the future of natural gas utilities in many
10 other states, including Hawaii, Maryland, Colorado, Massachusetts, Nevada,
11 and California.

12 In over a dozen dockets regarding utility-administered efficiency programs, I
13 have conducted expert analysis, provided litigation support, and drafted
14 testimony when appropriate on behalf of the State with respect to a number of
15 issues, including energy efficiency program implementation, cost-
16 effectiveness, design, and overlap between utility- and state-administered
17 programs. I have provided expert advice on demand-side management
18 programs in Nova Scotia regarding a range of issues including incentive-
19 setting methodologies, cost-benefit analysis, incentive setting, avoided costs,
20 load forecasting, and locational demand-side management. I also co-authored a

1 manual for regulators on designing performance incentive mechanisms, which
2 has been highly utilized by many states.

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

6 I hold a Master's in Public Administration from the University of
7 Massachusetts at Amherst and a Bachelor's in Economics from Rutgers
8 University. My resume is attached as Exhibit AN-1.

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

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

11 **Q. Have you previously testified before a state or provincial commission?**

12 A. Yes. I have testified before the California Public Utilities Commission, the
13 New York Public Service Commission ("PSC" or "Commission"), the
14 Pennsylvania Public Utility Commission, and the Public Service Commission
15 of South Carolina in the United States, as well as the New Brunswick Energy
16 and Utilities Board and the Nova Scotia Utility and Review Board in Canada.

1 **Q. In which proceedings before the New York PSC have you provided**
2 **testimony?**

3 A. I testified in two Con Edison rate cases (Cases No. 19-E-0065/19-G-0066 and
4 22-E-0064/22-G-0065) and in the previous rate case for Niagara Mohawk
5 Power Corporation (Cases 20-E-0380/20-G-0381) on behalf of NRDC.

6 **Q. What is the purpose of your testimony?**

7 A. The purpose of my testimony is to review and critique several of the proposed
8 gas-side investments by The Brooklyn Union Gas Company d/b/a National
9 Grid (“KEDNY”) and KeySpan Gas East Corporation d/b/a National Grid
10 (“KEDLI”) (collectively, “the Companies”), particularly as those investments
11 relate to energy affordability and state decarbonization policy.

12 **Q. How is the remainder of the testimony organized?**

13 A. In Section 2, I provide a summary of my conclusions and recommendations.
14 Section 3 describes relevant policy background and the Companies’ filing,
15 including proposed investments in advanced leak detection, hydrogen,
16 renewable natural gas (RNG), and pipe replacement. In Section 4, I describe
17 my concerns with the proposed investments in terms of affordability and
18 compliance with the *Climate Leadership and Community Protection Act*
19 (CLCPA). Finally, Section 5 describes my concerns with other aspects of the
20 Companies’ filing.

1 **2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

2 **Q. Please summarize your conclusions.**

3 A. My conclusions are summarized as follows:

- 4 • The Companies' gas investments align with National Grid's Clean Energy
5 Vision (CEV) and CLCPA study, however both of these documents depict
6 a pathway that is not compatible with the CLCPA. Further, the CEV
7 ignores very large costs that could fall on ratepayers. Given these
8 deficiencies and the lack of detail on its modeling and assumptions, it is not
9 appropriate to use the CEV for resource decisions in the context of this rate
10 case, or in any other proceeding.
- 11 • The Companies' proposed investments in hydrogen, RNG, and pipe
12 replacement in this proceeding have negative impacts on affordability, do
13 not represent least-cost approaches to CLCPA compliance, and have
14 serious air quality and health implications from a continued reliance on
15 combustion of fuels. These investments appear to be a step in a larger
16 strategy that uses hydrogen, RNG, and pipe replacement to mitigate GHG
17 emissions from its system. However, this investment, and the larger
18 strategy, puts the Companies on a path that is inconsistent with the
19 CLCPA.
- 20 • The use of satellites for leak detection is unproven.

- 1 • The Companies’ proposed negative incentive for failure to achieve
2 minimum leak-prone pipe replacement (LPP) targets and unitary cost
3 performance incentive for LPP would provide additional incentives to the
4 Companies to make gas-system investments that are not in the public
5 interest.
- 6 • The final strategy for decarbonizing the Companies’ load will almost
7 certainly differ from what National Grid outlined in its CLCPA study or
8 the CEV, because the Companies have not completed their Long-Term Gas
9 Plan and the related process, and the Department of Environmental
10 Conservation has yet to promulgate sector-specific reduction mandates
11 pursuant to the CLCPA. A longer rate plan term would cement the
12 Companies’ proposed strategy, making it more difficult and more
13 expensive to change course.

14

15 **Q. Please summarize your recommendations.**

16 A. My recommendations are summarized as follows:

1 • The PSC should not approve the proposed capital investments and
2 operations and maintenance costs related to hydrogen and RNG. Any
3 consideration of these proposed investments should only happen after
4 the conclusion of a transparent, comprehensive examination of
5 decarbonization options for the Companies’ gas loads, as the
6 Companies are required to perform for the Long-Term Gas Planning
7 process, and only to the extent that the results of this process finds that
8 these investments are cost effective approaches and will meet the
9 CLCPA’s sector-specific emissions reductions targets, scheduled to be
10 set by the Department of Environmental Conservation within the
11 coming months.

12 • Similarly, the PSC should not approve the proposed capital investments
13 and operations and maintenance costs for proactive pipe replacement.
14 Instead, the Commission should direct the Companies to limit the
15 budget for the MRP to emergent issues with cast iron and bare steel
16 pipe that is either actively leaking or considered imminent high risk for
17 leaking, based on frequent and comprehensive surveys of the system.
18 Further, the PSC should direct the Companies to prioritize and conduct
19 solicitations for non-pipeline alternatives (NPA) wherever possible.

- 1 • The Companies should be required to provide more detail on the
2 effectiveness of satellite-based leak detection if they are going to
3 pursue its implementation.
- 4 • The PSC should not approve the Companies’ proposed PMR unitary
5 cost incentive mechanism. Instead, the PSC should prioritize an
6 incentive mechanism for 1) leak detection and repair and 2) successful
7 implementation of NPAs.
- 8 • If the PSC approves a rate plan, it should be for one or two years only.

9 **3. BACKGROUND AND OVERVIEW OF FILING**

10 **3.1. Policy Background**

11 **Q. Please describe the energy and climate policy background against which**
12 **you considered the Companies’ proposed investments.**

13 A. The CLCPA requires statewide reductions in greenhouse gas (GHG) emissions
14 across all sectors. Relative to 1990 levels, it requires reductions of 40 percent
15 by 2030 and no less than 85 percent by 2050.

16 In addition, this law created the Climate Action Council (CAC), which is
17 charged with developing a scoping plan to meet these targets, released in
18 December 2022 (“Scoping Plan”). To inform the Scoping Plan, the New York
19 State Energy Research and Development Authority (NYSERDA) and New

1 York State Department of Environmental Conservation commissioned an
2 analysis, called the Integration Analysis, which was released in December,
3 2021¹ and examined the economy-wide benefits, costs, and GHG emissions
4 reductions of pathways to achieve the CLCPA emission limits. It modeled
5 three scenarios that meet CLCPA emission-reduction requirements: Strategic
6 Use of Low-Carbon Fuels (Scenario 2), Accelerated Transition Away from
7 Combustion (Scenario 3), and Beyond 85% Reduction (Scenario 4). For
8 context, the Integration Analysis also included a reference case and a scenario
9 based on the Advisory Panel’s (AP) initial recommendations (Scenario 1) but
10 did not project that either will meet CLCPA requirements.²

11 **3.2. Overview of the Companies’ Filings**

12 **Q. Please provide an overview of the Companies’ filings.**

13 A. Both KEDNY and KEDLI seek revenue increases in the current rate filing.
14 KEDNY seeks to increase revenue by \$414 million for the twelve months
15 ending March 31, 2025 (the Rate Year). This requested increase is equivalent
16 to a 28 percent increase in KEDNY’s overall delivery revenue. KEDLI’s
17 requested revenue increase for the same time period amounts to \$228 million,

¹ Energy and Environmental Economics and Abt Associates 2021. New York State Climate Action Council Draft Scoping Plan: Integration Analysis Technical Supplement. Prepared for the New York State Energy Research and Development Authority and New York State Department of Environmental Conservation. Available at <https://climate.ny.gov/Climate-Resources#nygov-header>.

² Id., p. 6-7.

1 equal to a 24 percent increase in delivery revenue.³ In the filings, the
2 Companies propose new rates for the Rate Year but also provide cost data for
3 three additional years “to facilitate a potential multi-year settlement.”⁴ The
4 overall term covered by this filing, four years, is longer than the three-year
5 term provided in previous rate cases.

6 **Q. What major initiatives and investments have the Companies proposed?**

7 A. The Companies propose many investments. In this testimony, I discuss the
8 following:

- 9 • Advanced Leak Detection
- 10 • Proactive Main Replacement
- 11 • RNG connections
- 12 • “Green” hydrogen blending project

13 **Q. What investments do the Companies propose regarding Advanced Leak**
14 **Detection?**

15 A. The Advanced Leak Detection program represents an enhancement to efforts
16 under an existing program. The survey component of the Advanced Leak
17 Detection program will be a continuation of the Enhanced High Emitter

³ National Grid. April 28, 2023 filing letter. Case Nos. 23-G-0225 and 23-G-0226.

⁴ Id.

1 Methane Detection pilot program (approved in 2019 Rate Cases) in FY 2024.
2 This program relied on cavity ringdown spectroscopy (CRDS), though it's
3 unclear if the same technology will be used in this program. The Companies
4 plan to evaluate other technologies, such as satellite imagery.⁵

5 **Q. What investments do the Companies propose for their Proactive Main**
6 **Replacement programs?**

7 A. The Companies propose to continue their proactive leak-prone pipe
8 replacement programs, with the goals of improving system safety and
9 performance and reducing methane emissions. The Companies indicate that
10 they use a risk ranking algorithm combined with engineering judgment to
11 develop leak-prone pipe replacement strategies aimed at prioritizing the
12 replacement of older, higher-risk leak-prone pipe.⁶ The Companies are
13 required to consider NPAs during this process.⁷ They propose to continue to
14 identify at least five leak-prone pipe projects annually that could be replaced
15 with NPAs, subject to customer consent. However, no projects have been
16 replaced with NPAs to date.⁸

⁵ Direct Testimony of Gas Safety Panel p. 22-24.

⁶ KEDNY Direct Testimony of GIOP panel, p. 31-32; KEDLI Direct Testimony of GIOP panel, p. 31-32.

⁷ Response to NRDC-020.

⁸ Response to NRDC-010.

1 KEDNY has proposed a minimum leak-prone pipe replacement mileage target
2 of 166 miles from CY 2024 to CY 2027.⁹ KEDLI has proposed a target of 465
3 miles during this time period.¹⁰ Both Companies are aiming for full
4 replacement of the existing leak-prone pipe inventory by approximately 2045.
5 The Proactive Mains Replacement (PMR) Program is projected to replace
6 about 50 percent of KEDNY’s leak-prone pipe mileage and 95 percent of
7 KEDLI’s mileage during the Rate Year and Data Years. The remaining
8 replacement will be accomplished by other programs.¹¹ The Gas Safety Panel
9 testimony outlines detailed metrics and targets for leak-prone pipe
10 replacement.

11 **Q. What investments do the Companies propose for RNG interconnections?**

12 A. Each of the Companies has proposed two local RNG interconnection projects
13 and an additional \$1 million in Data Year 3 for future RNG interconnections.¹²
14 The Companies are proposing to invest in equipment to enable three
15 components of the RNG interconnection process: gas quality monitoring,
16 pressure regulation, and odorization. Proposed investments also include
17 associated piping. As justification for the investments, the Companies claim

⁹ KEDNY Direct Testimony of the GIOP Panel, p. 28, 31.

¹⁰ KEDLI Direct Testimony of the GIOP Panel, p. 28, 31.

¹¹ KEDNY Direct Testimony of the GIOP Panel, p. 31; KEDLI Direct Testimony of the GIOP Panel, p. 31.

¹² KEDNY Direct Testimony of GIOP panel, p. 78; KEDLI Direct Testimony of GIOP panel, p. 74.

1 that these projects will result in downstream and upstream emissions
2 reductions, including local emissions benefits from capturing methane that
3 may have been flared into the atmosphere.¹³ However, the Companies do not
4 propose to retain the environmental attributes of the RNG for the benefit of
5 their customers. For the largest proposed RNG interconnection project,
6 Newtown Creek, KEDNY has contracted with a firm to market and monetize
7 environmental credits associated with the project. KEDNY's revenue
8 requirement includes forecast revenues from sales and environmental credits
9 generated by this project.¹⁴ The Company plans to reconcile the forecast
10 revenues with actual revenues and reflect the difference through future
11 recovery or credits.¹⁵

12 **Q. Please describe the proposed capital investments for RNG.**

13 A. KEDNY is proposing to recover costs for the Newtown Creek Project, which
14 completed commissioning in March 2023. This project converts biogas
15 generated from the Newtown Creek Wastewater Treatment Plant into RNG
16 and injects it into the Greenpoint distribution system. The Newtown Creek
17 Project is expected to generate the following gas quantities:

- 18 ○ FY24: 169,765 Dth

¹³ KEDLI Direct Testimony of GIOP, p. 77; KEDNY Direct Testimony of GIOP panel, p. 79-81.

¹⁴ *Id.*

¹⁵ KEDNY Direct Testimony of the GIOP Panel, p. 78-83; KEDLI Direct Testimony of the GIOP Panel, p. 74-77.

- 1 ○ FY25: 196,165 Dth
- 2 ○ FY26: 215,782 Dth
- 3 ○ FY27: 226,571 Dth
- 4 ○ FY28: 237,900 Dth¹⁶

5 Costs for Newtown Creek include a conditioning system (gas compression,
6 moisture knockout, gas conditioning, and waste stream collection and flaring)
7 and the RNG interconnection (gas quality equipment, odorization, metering,
8 pressure regulation, and control room equipment).¹⁷

9 In addition, the Companies have each proposed one RNG interconnection at a
10 wastewater treatment plant and a second RNG interconnection at a food-to-
11 waste RNG facility. KEDNY's wastewater treatment plant RNG site is in
12 southern Queens, within a Disadvantaged Community. This project is expected
13 to inject over 570 Dth per day into the Company's distribution system.¹⁸

14 KEDLI's wastewater treatment plant site is in Nassau County and is expected
15 to inject about 450 Dth per day.¹⁹ KEDNY plans to inject over 2,100 Dth per
16 day into its distribution system from its food-to-waste RNG interconnection.²⁰

¹⁶ KEDNY Direct Testimony of GIOP panel, p. 81-83.

¹⁷ KEDNY Direct Testimony of GIOP panel, p. 81-83.

¹⁸ KEDNY Direct Testimony of GIOP panel, p. 80.

¹⁹ KEDLI Direct Testimony of GIOP, p. 76.

²⁰ KEDNY Direct Testimony of GIOP panel, p. 80.

1 KEDLI’s food-to-waste site, located in Suffolk County and rezoned for
2 industrial use in Calverton, New York, will initially produce up to 400 Dth per
3 day. This facility plans to eventually double its production.²¹

4 **Q. What investments does KEDLI propose for hydrogen blending?**

5 A. KEDLI proposes a hydrogen blending demonstration project. This project
6 would expand an existing green hydrogen facility at the Town of Hempstead
7 Department of Conservation and Waterways on Long Island. The facility
8 currently serves as a hydrogen vehicle fueling station, using wind and solar
9 energy located near the site. The Company has proposed to develop an
10 expanded compressed hydrogen storage system to enable off-peak and night-
11 time production of hydrogen for both blending into the Company’s nearby gas
12 distribution system (to serve 844 customers) and to continue providing vehicle
13 fueling. The project is planned to be operational in March 2025.²² The
14 hydrogen blend rate will start at 3 percent by volume and increase gradually to
15 a maximum of 20 percent, which is equivalent to about 7 percent by energy.²³
16 The facility will produce up to 3.5 Dth of green hydrogen per hour to reach the
17 maximum blend rate. The Company claims that the solar and wind energy
18 located at the facility is enough to produce hydrogen for four months per year

²¹ KEDLI Direct Testimony of GIOP, p. 76.

²² KEDLI Direct Testimony of GIOP, p. 81-83.

²³ Response to NRDC-027.

1 at the 20 percent blend rate. The Company plans to contract for the delivery of
2 supplementary requirements to the site in colder months.²⁴ The Company did
3 not provide additional detail or specify what supplementary requirements they
4 will contract for or have delivered to the site that they claim will make the
5 hydrogen “completely carbon free.”²⁵

6 KEDLI states that customers receiving blended hydrogen will be billed at the
7 same rate as paid for conventional gas.²⁶ The HyGrid project is partially
8 funded by the New York State Department of Environmental Conservation.

9 KEDLI states that HyGrid may also receive *Inflation Reduction Act* tax credits
10 and also expects it to generate environmental attributes. The Company has
11 proposed to true-up these revenues and defer the difference for future recovery
12 or credits to customers.²⁷

13 **Q. What is the total investment for these proposals?**

14 A. In Table 1, I show proposed investments for the KEDNY projects. The PMR
15 costs represent a large and increasing capital spending category, as compared
16 to the RNG interconnections.

²⁴ KEDLI Direct Testimony of GIOP, p. 84.

²⁵ *Id.*

²⁶ *Id.*, p. 83

²⁷ KEDLI Direct Testimony of the GIOP Panel, p. 81-84.

1 *Table 1. Proposed investments by fiscal year: KEDNY (\$million)*

	FY24	FY25	FY26	FY27	FY28
PMR	\$156.5	\$186.7	\$223.4	\$251.5	\$269.9
RNG Interconnections	\$15.7	\$2.2	\$9.2	\$1.8	\$1.8
Subtotal	\$172.2	\$188.9	\$232.6	\$253.3	\$271.7
Total Capital Forecast	\$829.4	\$958.7	\$992.8	\$975.5	\$978.6
Percent of total	21%	20%	23%	26%	28%

2 *Source: KEDNY Exhibit GIOP-1 C&U.*

3 Table 2 shows KEDLI’s proposed project investments. Of the three categories
 4 shown here, the PMR program represents the vast majority of proposed
 5 investment spending. PMR, RNG interconnections, and HyGrid combined
 6 constitute almost half of capital spending.

7 *Table 2. Proposed investments by fiscal year: KEDLI (\$million)*

	FY24	FY25	FY26	FY27	FY28
PMR	\$242.6	\$270.1	\$287.6	\$297.8	\$311.1
RNG Interconnections		\$2.7	\$4.9	\$2.3	\$2.3
HyGrid	\$6.3	\$6.8			
SubTotal	\$248.9	\$279.6	\$292.5	\$300.1	\$313.4
Total Capital Forecast	\$509.1	\$653.2	\$712.3	\$720.1	\$641.7
Percent of total	49%	43%	41%	42%	49%

8 *Source: KEDLI Exhibit GIOP-1 C&U*

9 **Q. Please describe the Companies’ proposed performance incentive related to**
 10 **the cost of PMR.**

11 A. The Companies propose a unit cost productivity incentive for the PMR
 12 program to challenge them to complete leak-prone pipe (LPP) replacement in a

1 “more efficient manner.”²⁸ With the proposed mechanism, each company
2 would only be eligible to receive this incentive if it achieves its minimum LPP
3 replacement targets for each rate year.²⁹ As proposed, the company could
4 achieve a positive revenue adjustment of up to 10 basis points if the company
5 achieves the unit cost savings for LPP replacement, following a set schedule
6 with decreasing unitary costs.

7 **Q. Please describe the Companies’ proposed performance incentive related to**
8 **LPP replacement.**

9 A. The Companies propose a negative incentive, with 15 basis points at risk, for
10 not meeting minimum LPP replacement mileage targets.³⁰

²⁸ KEDLI Direct Testimony of the GIOP Panel, p. 23.

²⁹ Ibid.

³⁰ KEDNY and KEDLI Gas Safety Panel, p. 37.

1

2 **4. CONCERNS WITH THE COMPANIES' APPROACH TO GAS**
3 **INFRASTRUCTURE PLANNING AND INVESTMENTS**

4 **4.1. Overall Approach**

5 **Q. Do you have concerns with the Companies' overall approach to planning**
6 **for gas infrastructure?**

7 A. Yes. In testimony in this rate case, the CLCPA panel repeatedly refers to
8 National Grid's CEV.³¹ The Companies' rate plan, including the investments
9 highlighted above, aligns with the CEV. However, the CEV is not consistent
10 with the requirements of the Gas Planning Order or the CLCPA.

11 **Q. What is the CEV?**

12 A. The CEV provides a high-level overview of National Grid's preferred strategy
13 for responding to climate change regulations and legislation enacted by the
14 states in which it operates. The CEV does not include critical details about the
15 key assumptions and analyses that National Grid used to develop it and that are
16 required to substantiate the reasonableness of the results.

³¹ KEDLI and KEDNY Direct Testimony of Climate Leadership and Community Protection Act Panel, p. 10-12, 40.

1 National Grid’s vision focuses on leveraging its “existing gas and electric
2 networks to achieve fossil-free heat fairly, affordably, and reliably for our
3 customers and communities.”³² By emphasizing use of the existing gas system,
4 it reflects a generally *status quo* approach, one that includes some minor
5 adjustments to National Grid’s business around the fringes. For example,
6 National Grid considers changes to the fuel that runs through its existing pipe
7 infrastructure. As a somewhat larger change to its business model, it also
8 considers implementation of geothermal networks.³³

9 **Q. What are your concerns with the CEV?**

10 A. The CEV is inconsistent with the work of the CAC, as reflected in the
11 Integration Analysis and final Scoping Plan. Further, implementation of the
12 CEV would impose excessive costs on customers, and because of these high
13 costs, would effectively preclude attainment of the legislated targets of the
14 CLCPA.

15 **Q. Please explain.**

16 A. Per § 75-0109(2)(c), within four years of CLCPA’s enactment, the Department
17 of Environmental Conservation is charged with promulgating regulations to
18 ensure compliance with the CLCPA’s statewide emissions reduction limits.

³² National Grid. April, 2022. Our Clean Energy Vision: A Fossil-free Future for Cleanly Heating Homes and Businesses (CEV).

³³ CEV, p. 7.

1 These regulations must reflect, in substantial part, the findings of the Scoping
2 Plan.

3 Supporting the Scoping Plan, the Integration Analysis found that there are
4 multiple pathways to achieve the CLCPA emissions limits. This study found
5 that some resources, including widespread building electrification,
6 decarbonized electricity, and aggressive energy efficiency, are key, because all
7 of the scenarios projected to achieve the emissions reductions required by the
8 CLCPA include large amounts of these resources.³⁴ This analysis also found
9 that:

10 “the largest reductions [in emissions] are achieved through
11 building and transportation electrification. Because of the
12 extremely clean power sector in New York, even in the
13 Reference Case, electrification of fossil fuel consuming
14 devices has a large GHG reduction benefit, both due to
15 increased efficiency of electric devices and due to a fuel
16 switch from fossil combustion to relatively clean electric
17 generation. *Even in Scenario 2 [Strategic Use of Low-Carbon
18 Fuels], the reductions achieved by low carbon fuels are
19 relatively small, due to the treatment of low-carbon fuels in
20 the Climate Act gross emissions accounting framework.”*³⁵
21 [emphasis added.]

22 The Integration Analysis did not model any scenarios with more than 10
23 percent of buildings having fuel backup.³⁶ Also, exclusive use of alternative

³⁴ Draft Scoping Plan, p. 6 and 84.

³⁵ *Id.*, p. 27.

³⁶ Scenarios 3 (Accelerated Transition Away from Combustion) and 4 (Beyond 85% Reduction) see no fuel backup of heat pumps in buildings. Even the Integration Analysis’s Scenario 2, Strategic Use of Low-Carbon Fuels,

1 gases in buildings is very limited in the Integration Analysis: across all three
2 CLCPA-compliant scenarios, only 7 percent or less of total residential building
3 space heating equipment stock runs on alternative gases.³⁷ Instead, the
4 Integration Analysis relies on electric heat pumps for the vast majority of space
5 heating stock. In Scenario 2, 70 percent of heat pumps are air source heat
6 pumps *with no fuel backup*, and 20 percent are ground source heat pumps. In
7 Scenarios 3 and 4, 77 percent of heat pumps are air source *with no fuel backup*,
8 and the remaining 23 percent are ground source heat pumps.³⁸

9 In stark contrast to the findings of the Integration Analysis, National Grid
10 assumes—but provides no justification for assuming—that much greater use of
11 low carbon fuels would be CLCPA-compliant in its CEV. Specifically, National
12 Grid assumes that in 2050, 25 percent of buildings would have electric heating
13 systems with gas backup, 25 percent would use alternative gases only, and the
14 remaining half would use only electric heat pumps.³⁹

15 **Q. Do you have other concerns with the CEV?**

16 A. Yes. The lack of transparency into the CEV’s underpinnings severely impedes
17 stakeholders’ ability to verify National Grid’s claims about this plan’s

assumed only 10 percent of heat pumps would have fuel backup. (IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs.xls, Scenario Detail tab.)

³⁷ IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs.xls, tabs S2_Space heating-Res, S3_Space heating-Res, and S4_Space heating-Res.

³⁸ IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs.xls, Scenario Detail tab.

³⁹ CEV, p. 6.

1 feasibility, affordability, emissions reductions, or compliance with law. As a
2 result, I do not have confidence in the findings of the CEV and do not advise
3 using its conclusions in the context of resource decision-making.

4 Further, while I was not able to verify National Grid's inputs and assumptions,
5 I identified several critical flaws that call into question whether the CEV is a
6 viable, reasonable-cost plan for complying with the CLCPA.

7 **Q. Can you provide any examples of these critical flaws?**

8 A. Yes. National Grid's CEV relies extensively on RNG and hydrogen, which will
9 result in substantial increases in supply and capital costs, as well as problematic
10 air quality and health impacts (as discussed further in Sections 4.2.1 and 4.2.2).
11 These increases may drive customers to defect from the gas system, which will
12 leave the utility with unrecovered fixed costs and prompt it to seek further rate
13 increases. This could spiral into a rate crisis, in which the Companies would be
14 unable to recover their costs, and which would result in devastating
15 consequences for customers, particularly those who are most vulnerable.

16 As another example, National Grid assumes that much of the gas distribution
17 system will stay in place for the half of buildings that have "fossil-free" gases or
18 electric heating systems with gas furnace backup in the CEV. It is not clear,
19 however, to what extent National Grid considered targeted electrification with

1 pipe retirement,⁴⁰ which would avoid costs of maintaining and operating those
2 sections of gas distribution system and investments to replace leak-prone pipe.
3 National Grid’s focus on continued reliance on gas infrastructure and expensive
4 fuels such as hydrogen is concerning when electrification is viable, less
5 expensive, much more efficient, and would better position National Grid to help
6 the state achieve the requirements of the CLCPA.

7 Also, as discussed further in Section 4.3 below, National Grid’s assumption
8 about the percent of hydrogen that could be safely blended into the existing
9 distribution system does not reflect recent research suggesting that only a much
10 lower share of hydrogen is safe.⁴¹ Given the safety concerns with a higher share
11 of hydrogen, National Grid should factor in the need to replace infrastructure
12 and customer-owned equipment in a more comprehensive assessment of
13 strategies in all gas planning.

14 In the CEV, National Grid claims an outsized share of emissions for the state
15 as a whole. This assumption is unreasonable, given the high cost and lack of
16 technologies to decarbonize some other sectors and end uses (e.g., industrial

⁴⁰ In their testimony, the Companies appear to use the term “retirement” to mean “replacement” of pipes. By retirement, I mean removing the pipe from service and not installing a new pipe in its place.

⁴¹ Penchev, M., T. Lim, M. Todd, O. Lever, E. Lever, S. Mathaudhu, A. Martinez-Morales, and A.S.K. Raju. 2022. Hydrogen Blending Impacts Study Final Report. Agreement Number: 19NS1662. California Public Utilities Commission. Available at: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF>. See also, Melaina, M., Antonia, O., Penev, M. 2013. Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues. National Renewable Energy Laboratory Technical Report NREL/TP-5600-51995. Available at: <https://www.nrel.gov/docs/fy13osti/51995.pdf>.

1 processes, heavy duty transportation). A more reasonable approach is to reduce
2 emissions from the combustion of gas delivered to buildings by *at least* 85
3 percent by 2050. Also, it appears that the company did not take into account
4 the variation in emissions reductions of different types of renewable natural
5 gas (RNG). Likewise, the assumptions surrounding hydrogen do not appear to
6 reflect the uncertainty about the efficiency of production, safety, and climate
7 and other pollution impacts of using this fuel in this application.

8 I also note that the CEV appears to assume more RNG than is likely to be
9 available and does not adequately reflect the risk that hydrogen markets do not
10 develop as anticipated.

1 Finally, National Grid’s emissions accounting does not comply with CLCPA
2 emission accounting or methodology provided by the CAC. The CEV uses
3 emissions accounting based on the 100-year global warming potential (GWP)
4 of carbon emissions,⁴² though the CLCPA requires that emissions be calculated
5 using 20-year global warming potential (GWP-20).⁴³ The CEV undercounts
6 emissions impacts by using an accounting method with a longer time-horizon
7 for the warming impact of emissions. National Grid also specifically accounts
8 for RNG as having net zero emissions rather than emitting 117 lbs.
9 CO₂e/MMBtu, as under CLCPA-compliant accounting methods.⁴⁴ This raises
10 concerns given National Grid’s significant reliance on RNG in the CEV as
11 noted above.

12 **Q. What do you conclude regarding the CEV?**

13 A. The CEV ignores very large costs that could fall on ratepayers, as well as
14 negative health and air quality impacts. In light of these poor economics, the
15 CEV is not a reasonable plan for achieving the CLCPA emissions reduction
16 targets. Given these deficiencies and the lack of detail on its modeling and
17 assumptions, it is not appropriate to use the CEV for resource decisions in the
18 context of this rate case, or in any other proceeding.

⁴² CEV at Figure 7, p. 13.

⁴³ Climate Leadership and Community Protection Act. 2019

⁴⁴ Climate Action Council July 22, 2021 meeting presentation, slide 26.

1 **Q. The Companies also produced a CLCPA study. Do you find similar issues**
2 **with this study?**

3 A. Yes. National Grid's CLCPA study is somewhat more transparent than the
4 CEV. However, it suffers from the same critical flaws I describe above,
5 including but not limited to unrealistic assumptions about the building sector's
6 share of emissions, reliance on more expensive fuels like RNG and hydrogen,
7 and a focus on retaining the existing distribution system, despite the high costs
8 of doing so.

9 **Q. Are the proposed investments in this rate case consistent with National**
10 **Grid's CLCPA study and the CEV?**

11 A. Yes. As described in Section 3.2 of this testimony, the proposed investments
12 reflect a *status quo* approach to the existing system. They also include
13 investments to promote the use of RNG and hydrogen.

14 **4.2. Affordability of Proposed Investments**

15 **Q. Turning to the investments proposed in this rate case, what concerns do**
16 **you have about the affordability of the Companies' proposed investments?**

17 A. My concerns relate to (1) commodity cost increases, (2) capital cost increases,
18 and (3) impacts on rates as customers defect from the gas system or reduce

1 consumption in response to the first two categories. I address each of these
2 concerns in the remainder of Section 4.2.

3 **4.2.1. Increase in commodity costs**

4 **Q. How will the price of supply change under the Companies' proposed**
5 **investments?**

6 A. The Companies' proposed investments to enable blending of hydrogen and RNG
7 into supply will increase overall commodity costs.

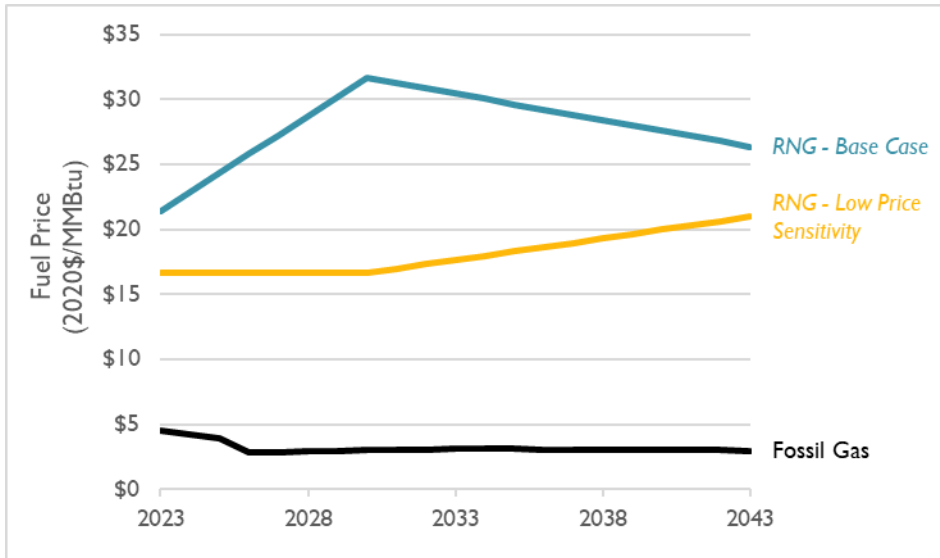
8 **Q. What are the projected costs of RNG?**

9 A. RNG costs far more than fossil gas. For its Base Case, the Integration Analysis
10 assumes a price of RNG (in 2020\$) of about \$23 per MMBtu in 2024, rising to
11 over \$31 per MMBtu in 2030 before declining to about \$24 per MMBtu in
12 2050. For comparison, this price is 5 to 10 times the Integration Analysis'
13 projected cost of residential fossil gas in its Reference case.⁴⁵ Even the
14 Integration Analysis's low-price sensitivity for RNG projects the price of this
15 fuel will run between 4 to 5 times the price of fossil gas.⁴⁶

⁴⁵ IA-Tech-Supplement-Annex-1-Input-Assumptions-2022.xls, 'Key Fuels Price Range' and 'Fuel Prices (Low Carbon Fuels)' tabs.

⁴⁶ Id.

1 Figure 1. Projected price of RNG and fossil gas in the Integration Analysis



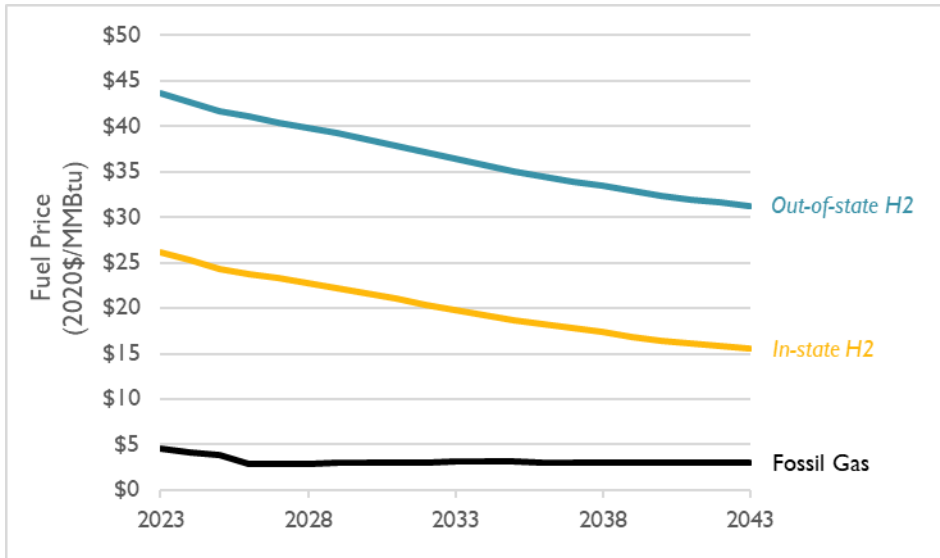
2

3 **Q. What are the projected costs of hydrogen?**

4 A. Hydrogen is currently very expensive. The Integration Analysis assumes a
5 price of over \$25 per MMBtu for in-state hydrogen, declining to about \$22 per
6 MMBtu in 2030 (2020\$). This price does not assume the *Inflation Reduction*
7 *Act* Production Tax Credit for hydrogen, which has not been implemented and
8 is pending guidance from the Treasury Department on how the credit would be
9 applied.

10 As modeled in the Integration Analysis, the price of hydrogen is roughly seven
11 times the Reference case price of residential fossil gas in 2030.

1 *Figure 2. Projected price of hydrogen and fossil gas in the Integration Analysis*



2

3 **Q. How much hydrogen is it reasonable to assume can be blended into**
4 **pipeline gas?**

5 A. Conventionally, it was assumed that 20 percent hydrogen by volume,
6 equivalent to about 7 percent by energy, is safe to blend into pipeline gas.

7 **Q. What level of emissions reduction could that represent?**

8 A. This means that GHG emission reductions would be capped at a 7 percent
9 reduction. Blending limits that are safe with current infrastructure may, in fact,
10 be lower,⁴⁷ which would make emission reductions even smaller. Hydrogen

⁴⁷ Penchev, M., T. Lim, M. Todd, O. Lever, E. Lever, S. Mathaudhu, A. Martinez-Morales, and A.S.K. Raju. 2022. Hydrogen Blending Impacts Study Final Report. Agreement Number: 19NS1662. California Public Utilities Commission. Available at: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF>. See also, Melaina, M., Antonia, O., Penev, M. 2013. Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues. National Renewable Energy Laboratory Technical Report NREL/TP-5600-51995. Available at: <https://www.nrel.gov/docs/fy13osti/51995.pdf>.

1 would be expensive, use large quantities of electricity, and not deliver much
2 benefit for building heat, especially compared with direct use of electricity for
3 heating with heat pumps which are two to three times more efficient than
4 heating with gas furnaces; and when accounting for energy input for water
5 electrolysis to produce hydrogen, the efficiency of heat pumps looks even
6 better.

7 **4.2.2. Proposed increase in capital costs**

8 **Q. Do the costs associated with the Companies' proposed capital investments**
9 **reflect the entire costs associated with their strategy for reducing GHGs?**

10 A. No. For the Companies to pursue their strategy for reducing GHGs, they will
11 likely need many more capital investments beyond the HyGrid and RNG
12 investments proposed in this case. These may include many additional
13 hydrogen and RNG production facilities and interconnections.

14 **Q. Do the Companies' proposed capital investments in HyGrid reflect all the**
15 **costs associated with their plan to blend hydrogen into pipelines?**

16 A. No. Hydrogen blending also requires replacement of metal pipes in the existing
17 system, which would speed up the need for expensive pipeline replacement.
18 KEDLI plans to increase hydrogen blends to 20 percent. Both utilities appear
19 to be replacing pipes to allow for hydrogen blending. KEDLI indicated that the

1 “gas delivery system in Point Lookout is fed by a 60 psi main and comprises
2 seven miles of gas mains. By the time blending operations commence, that
3 pipeline will have been replaced with HDPE piping. The research from Stony
4 Brook University, NREL, and others have concluded that HDPE piping used in
5 gas distribution systems is compatible with hydrogen regardless of blend
6 level." The Stony Brook study interim results "confirm the compatibility of the
7 polyethylene pipes and grades of protected steel used by KEDLI with H2
8 blending."⁴⁸ Likewise, KEDNY’s mileage count of leak-prone pipe "includes
9 about 0.8 miles of [leak-prone pipe] over the rate years to make Coney Island
10 area ready for Hydrogen blend."⁴⁹ The costs of this pipe replacement might be
11 avoided but for the hydrogen blending that the Companies are proposing. Cost
12 recovery for pipe replacement occurs for decades, meaning that customers
13 could be saddled with high rates for many years or that the Companies could
14 be faced with stranded assets. Conversely, paired pipe retirement and
15 electrification of customer loads on the retired pipe would avoid expensive
16 pipe replacement costs and provide customers with long-term savings.

⁴⁸ Direct Testimony of KEDLI GIOP Panel p. 79, 82.

⁴⁹ KEDNY Exhibit GIOP-5 p. 167.

1 **Q. Do the Companies’ proposed capital investments in PMR reflect all the**
2 **costs associated with their plan to continue using the gas distribution**
3 **system?**

4 A. No. As discussed further below, reliance on gas backup heating as a
5 decarbonization strategy will require continued investments in the gas system
6 as pipes that are currently in good condition age or are damaged. This will
7 keep rates high for customers.

8 **Q. The Companies indicate that they are committed to considering non-**
9 **pipeline alternatives. Does this commitment offset the PMR investments?**

10 A. Probably not. The Companies have not identified any NPAs yet, and hence do
11 not provide specific avoided costs, lengths of pipe, or any other critical
12 information for comparing with pipe replacement.⁵⁰ Even if they had, their
13 commitment to NPAs appears to be very small—only five projects—compared
14 to the massive investment they propose for PMR.

15 **Q. Why haven’t the Companies identified any NPAs at this point?**

16 A. That is not clear. However, other utilities are successfully identifying and
17 implementing NPAs, including Con Edison.⁵¹ KEDLI’s and KEDNY’s service

⁵⁰ Response to NRDC-020.

⁵¹ For example, Con Edison put out a market solicitation for the Soundview Area project in the Bronx in December 2021 with the goal of avoiding traditional system upgrades and projects. In 2022, the Commission approved the amortization period and shareholder incentive mechanism for multiple

1 areas are not so unique that they cannot leverage NPAs. Fundamentally, this
2 points to a problem with the Companies' overall approach to how much pipe
3 needs replacing versus retiring with NPAs.

4 **Q. What other concerns do you have with the Companies proposed**
5 **investments in PMR?**

6 A. The Gas Infrastructure and Operations Panel (GIOP) talks about how PMR is
7 seeing increases in costs, such as with paving costs. Especially considering this
8 context in which costs of pipe replacement are increasing, the continued
9 emphasis on PMR makes no sense for ratepayers.

10 **Q. How could the Companies defer or avoid investments in PMR?**

11 A. The Companies could limit the budget for the MRP to emergent issues with
12 cast iron and bare steel pipe that is either actively leaking or considered high
13 risk for leaking. Such issues could be identified using frequent and
14 comprehensive surveys of the system. For example, Con Edison committed to
15 surveying one third of its gas system for leakage every year.

area load relief NPA projects, including the Soundview Area project. Based on Con Edison's current plans, the Soundview NPA portfolio of projects is required to reduce at least 1,136 Dth/dy of peak gas demand. All measures are to be installed and operational by November 1, 2024. Please see, Consolidated Edison Company of New York. 2022. Non-Pipeline Alternatives Implementation Plan. Case 20-G-0131. Available at: <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B6A490BBB-0E8B-41F9-9040-9342758D8AE2%7D>.

1 Also, the Companies could more aggressively pursue NPAs, including paired
2 pipe retirement and electrification of customer loads on the retired pipe.

3 Wherever possible, NPAs should be prioritized over traditional infrastructure
4 investment. Doing so will require adequate lead time for soliciting NPAs and
5 reconsideration of traditional infrastructure project start dates, which the
6 Companies generally set in Rate Year 1.

7 **4.2.3. Impact on rates**

8 **Q. Please describe the impact these increases in supply and capital costs are**
9 **likely to have on rates.**

10 A. Synapse conducted modeling to better understand the rate, financial, and
11 emissions impacts of the Companies' proposed investments. Using the Gas Rate
12 Model (GRM),⁵² Synapse modeled two scenarios to isolate the impacts of the
13 proposals described above on revenue requirements and rates. These scenarios
14 include: (1) a case that included both capital expenditures and operating
15 expenditures for the Companies' proposed investments, specifically the PMR,

⁵² The GRM allows Synapse to project gas utility rates based on different scenarios for utility investment, sales, and financial models. Synapse used input data from annual utility reports to state regulators, alongside data from the Pipeline and Hazardous Materials Safety Administration (for gas pipeline investment data) and rate cases (such as depreciation and cost-of-service studies) to build a model of the past up to the present. The model tracks utility plant in service, depreciation, capital additions and retirements, operations and maintenance, and income taxes. It accounts for capital structure and changes in tax rates. Looking forward from the present, the model allows testing scenarios for different levels of investment and customer growth or decline, pipeline replacement programs, early retirements, stranded costs, and changes in depreciation rates. Synapse has developed ways to map changes in customer numbers to changes in miles of pipeline in service and other aspects of capital plant.

1 hydrogen, and RNG programs, (“Companies’ Preferred Scenario”) and (2) a
2 case that removed the investments listed above and included no blend of
3 hydrogen or RNG (“No New Investments”).

4 **Q. Please describe the Companies’ Preferred Scenario.**

5 A. The Companies’ Preferred Scenario extends the PMR programs until the
6 Companies have replaced all of their leak-prone pipes, around 2045. It assumes
7 hydrogen prices consistent with the Integration Analysis in-state prices and
8 base case RNG prices. The modeling does not assume use of out-of-state
9 hydrogen, which will be much more expensive; however, some hydrogen
10 could come from out-of-state, thus increasing costs. The scenario assumes no
11 changes to the Companies’ capital structure from the most recently approved
12 rate case in cases 19-G-0309 and 19-G-0310. Lastly, it holds the Companies’
13 capital and operational expenses constant in real dollar terms throughout the
14 study period. For both companies, it assumes an equity ratio of 48 percent and
15 a return on equity (ROE) of 8.8 percent. For KEDLI, it assumes an after-tax
16 weighted average cost of capital (WACC) of 6.21 percent and an after-tax
17 WACC of 6.22 percent for KEDNY.

18 **Q. Please describe the No New Investments scenario.**

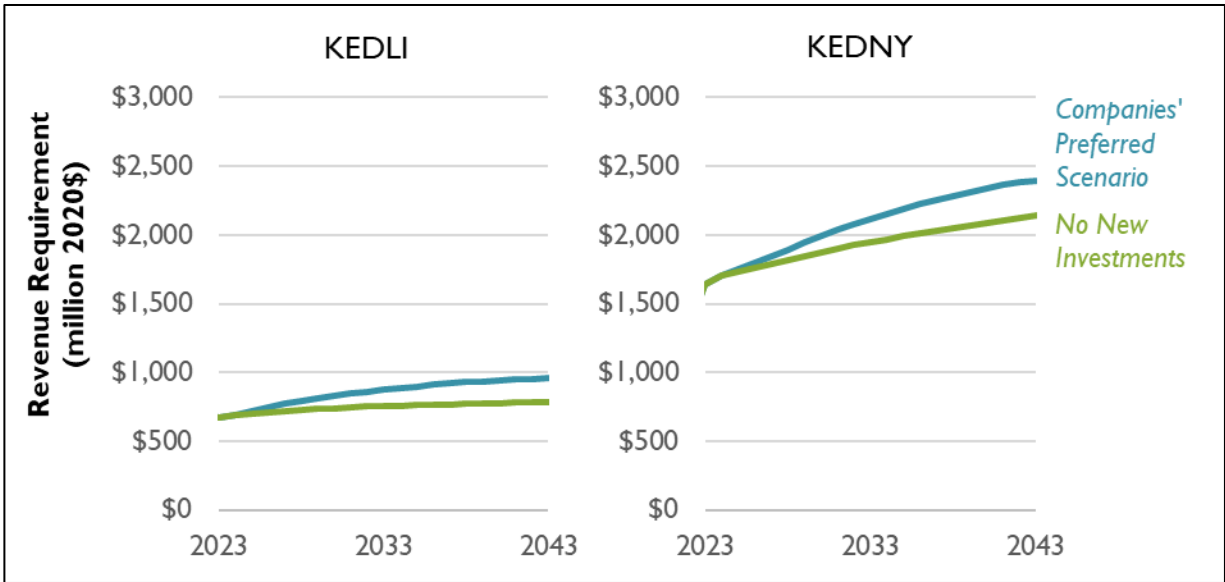
19 A. This case removes the investments in PMR. It also does not include hydrogen
20 or RNG blending, and the associated capital and operating expenses.

1 Otherwise, the assumptions are the same, including allowing reactive
2 investments in main replacements for active leaks.

3 **Q. What does the modeling show?**

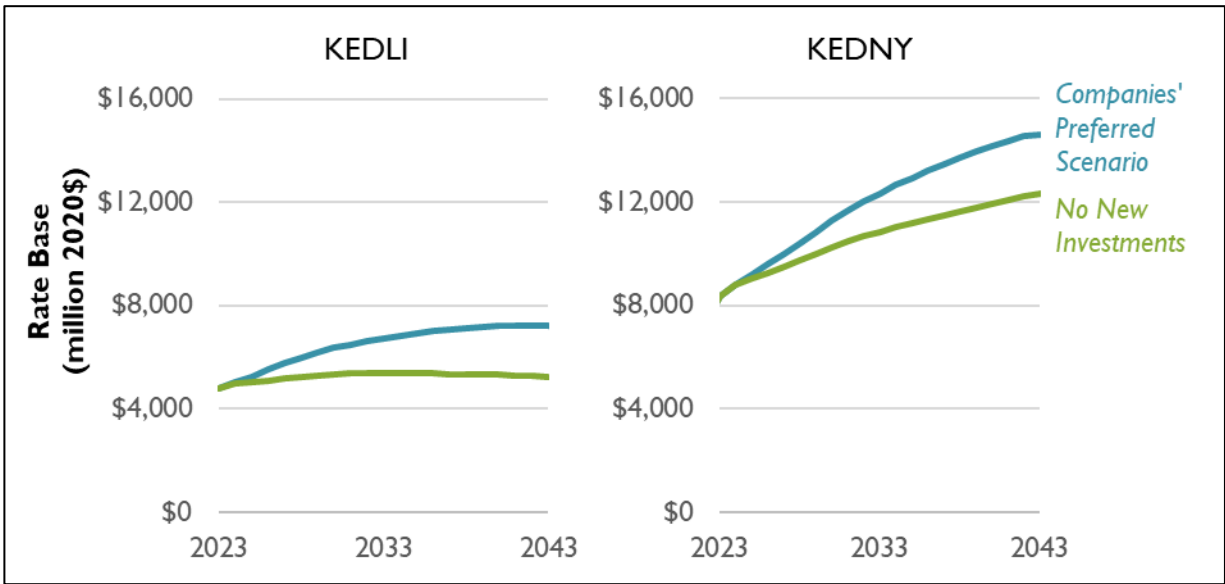
4 A. Based on these inputs, both companies would see substantial revenue
5 requirement and rate base growth for the next 20 years, as shown in Figure 3
6 and Figure 4. Pipe replacements have a long timeline for cost recovery, and the
7 magnitude of PMR investments results in a roughly 22 percent increase in
8 KEDLI's revenue requirement over the next 20 years in the scenario with the
9 proposed investment, compared with modest growth in the No New
10 Investments case. Likewise, KEDLI's rate base would see a roughly 38 percent
11 increase over the next 20 years in the Companies' Preferred Scenario relative
12 to the No New Investments case. Similarly, these proposed investments would
13 result in an increase of 11 percent to KEDNY's revenue requirement over the
14 next 20 years, and an increase of KEDNY's rate base by 18 percent.

15 *Figure 3. Revenue requirement under both scenarios*



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3 *Figure 4. Rate base under both scenarios*

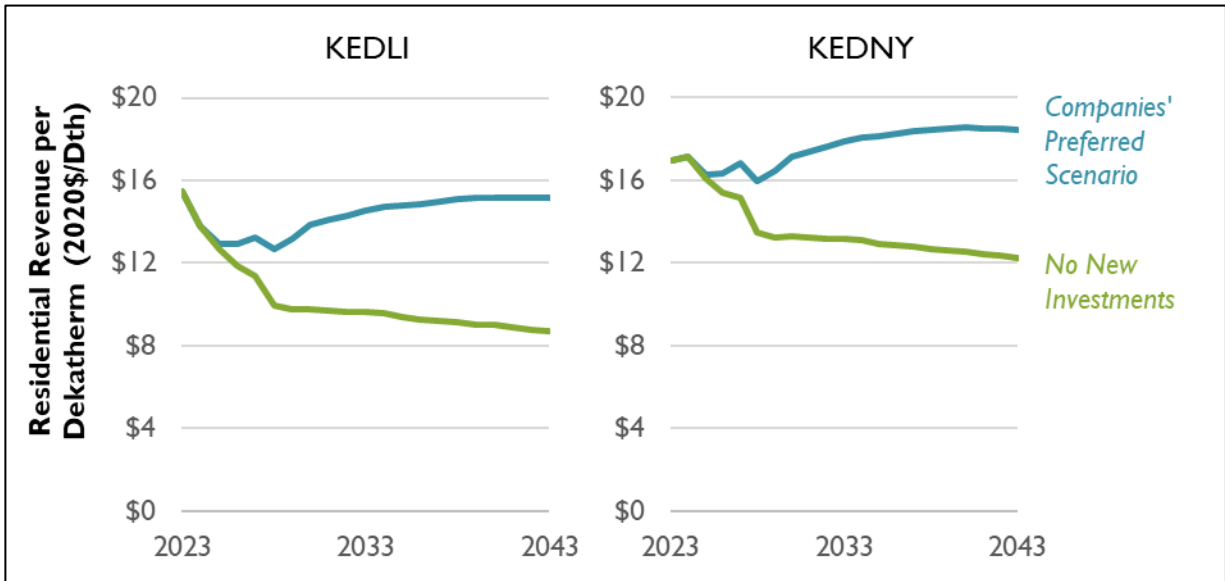


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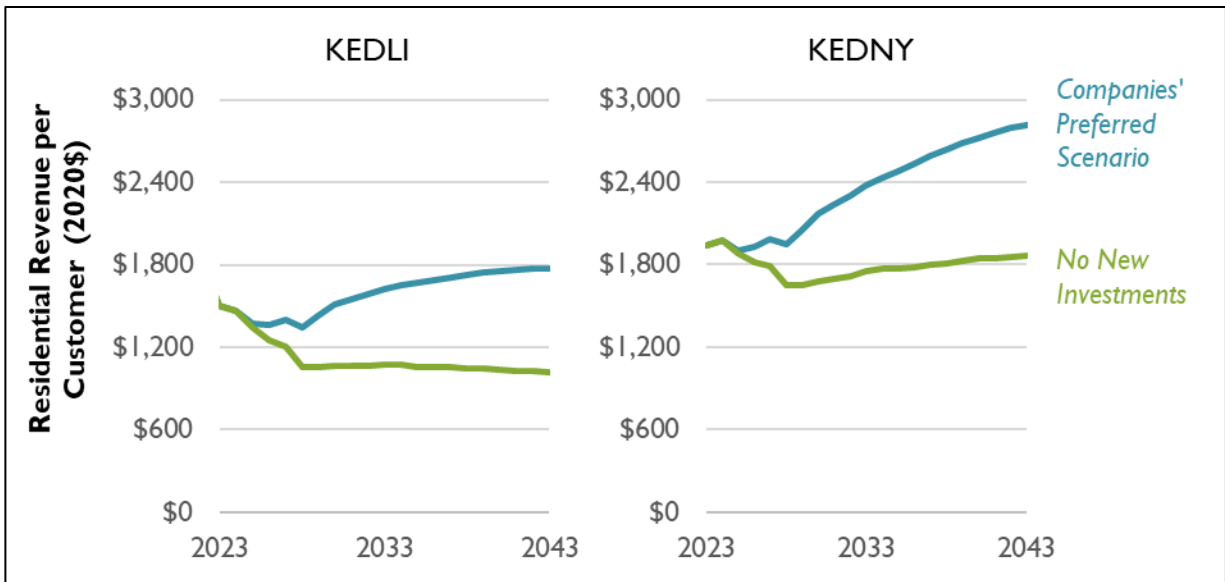
5 Figure 5 shows residential revenue per dekatherm, as an approximation of
 6 rates. Revenue per dekatherm is the utility's annual revenue requirement

1 (including fuel costs, return on rate base, and depreciation and operating
 2 expenses), divided by the projected amount of gas sold to customers. Likewise,
 3 Figure 6 shows revenue per customer, an approximation of annual customer
 4 energy bills, calculated as the utility's annual revenue requirement divided by
 5 the projected number of customers.

6 *Figure 5. Residential revenue per dekatherm*



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 9 *Figure 6. Residential revenue per customer*



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For both revenue per dekatherm (rates) and revenue per customer (energy bills), KEDLI’s customers would see a 74 percent increase under the Companies’ Preferred Scenario by 2043, while KEDNY’s customers would see a 52 percent increase in rates and bills.

Q. What do you conclude?

A. The Companies’ proposed investments, coupled with the high commodity costs associated with RNG and hydrogen, will result in substantial increases in rates.

Q. Why are the proposed increases in rates concerning?

A. These proposed increases in rates must be considered against the backdrop of local, state, and national policy and economics. Residential and commercial

1 customers have choices for building heating. There are many drivers for
2 customers to switch their loads to electric, including federal heat pump
3 incentives,⁵³ Local Law 97,⁵⁴ and state decarbonization policies and
4 incentives.⁵⁵ Also, customers are concerned about the health impacts of gas.
5 Combined with these other factors, the gas rate increases will drive customers
6 to defect from the gas system or to dramatically reduce consumption. This
7 reduced demand will leave the utilities with unrecovered fixed costs and/or
8 reduced returns to investors, prompting them to seek rate increases from an
9 increasingly small customer base. A rate crisis could ensue. The resulting high
10 energy bills would burden those with the least means to electrify their end uses,
11 including renters and low and moderate income customers.

⁵³ The IRA offers Efficiency Tax Credits for 30 percent of the cost of qualified energy efficiency projects, up to \$2,000 for heat pump water heaters. (American Council for an Energy-Efficient Economy. 2022. "Policy Brief: Home Energy Upgrade Incentives." Available at: https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_9-27-22.pdf) The IRA 25C tax credit covers electric upgrades needed to switch to heat pumps. The IRA also created the High-Efficiency Electric Home Rebate Program. Under this program, households earning less than 80 percent of the area median income are eligible for a rebate of up to \$1,750 for heat pump water heater installation; households earning up to 150 percent of the area median income can receive a rebate of up to \$875 for that measure. Income-eligible households can use the tax credit and claim the rebate. (House Committee on Ways & Means and House Committee on Energy & Commerce. 2022. "The Inflation Reduction Act: Information on Energy Rebates and Tax Credits Available to Constituents to Help Them Save Money." Available at: https://larsen.house.gov/uploadedfiles/11.29.22_inflation_reduction_act_ira_energy_rebate_and_tax_credit_information_fact_sheet.pdf)

⁵⁴ Local Law 97 supports efficiency retrofits, including oil or gas to electric heating. (Local Laws of the City of New York for the Year 2019: Local Law No. 97 of 2019 (April 2019), https://www.nyc.gov/assets/buildings/local_laws/1197of2019.pdf)

⁵⁵ Under the Clean Heating and Cooling Communities Campaign, participants receive no-cost support to switch to clean, efficient heat pump system and away from oil or gas. (New York State Energy Research and Development Authority (NYSERDA). Clean Heating and Cooling Communities Campaign. <https://www.nyserd.org/All-Programs/Clean-Heating-and-Cooling-Communities>) Also, the New York State Clean Heat program provides rebates for installing cold-climate, electric heat pumps that can be combined with IRA incentives. (NYS Clean Heat. <https://cleanheat.ny.gov/>)

1 **4.3. CLCPA Compliance**

2 **4.3.1. Strategy for Decarbonizing Gas System**

3 **Q. What concerns do you have about the Companies’ strategy to rely on**
4 **widespread hybrid heating rather than full building electrification?**

5 **A.** As discussed in Section 4.1, the Integration Analysis did not consider hybrid
6 heating as a primary strategy for achieving decarbonization and CLCPA
7 targets. However, National Grid identifies hybrid electric-gas heating systems
8 as a pillar of its vision for fossil-free heat.⁵⁶ Widespread hybrid heating is not a
9 viable and cost-effective strategy for CLCPA compliance, because it requires
10 dependence on large quantities of expensive, alternative fuels, including
11 hydrogen. Green hydrogen is extremely energy-intensive; the amount of
12 renewable energy needed to produce green hydrogen is staggering,⁵⁷ and that
13 fuel should be reserved for strategic application in hard-to-electrify sectors.
14 In light of the emissions and economic problems with hydrogen and RNG use
15 in the proposed application, there is cause for concern that the Companies are
16 pursuing a path that would not achieve CLCPA targets and are increasing
17 stranded-cost risk down the road—when choices will be more costly and more

⁵⁶ CLCPA Panel, Exhibit CLCPA-2.

⁵⁷ Heating buildings with hydrogen would require on the order of 5 times the renewable energy to heat the same buildings with heat pumps powered by renewable electricity. See, e.g., the Hydrogen Science Coalition, <https://h2sciencecoalition.com/data-resources/>.

1 limited. This approach delays the adoption of better available options in favor
2 of costly fuel options that will lead to increased rates and increase the risk of
3 unmanageable customer defection later on. Instead, a strategy of minimizing
4 hybrid heating using alternative fuels and reducing the size of the gas system
5 leaves options open in the future.

6 **Q. Have the Companies considered whether their proposed strategies provide**
7 **least-cost or even low-cost solutions for decarbonization?**

8 A. No. The Companies did not compare the costs of different GHG-mitigation
9 measures.⁵⁸ As I testified along with my colleague Dr. Asa Hopkins in the Con
10 Edison rate case, pipeline replacement there compared very unfavorably with
11 electrification on the basis of dollars per ton of CO₂e saved.⁵⁹ Like Con
12 Edison, KEDNY also has high pipe replacement costs— an average of \$4.5
13 million per mile.⁶⁰

14 Likewise, the HyGrid and RNG interconnections are high-cost approaches to
15 reducing GHG emissions.

16 Notably, the Companies' demand for low-carbon fuels would contribute to an
17 increase in the price of such fuels for other sectors that cannot easily electrify

⁵⁸ Response to NRDC-020.

⁵⁹ Direct Testimony of Alice Napoleon and Asa Hopkins, PhD on Behalf of Natural Resources Defense Council.
May 20, 2022. Case 22-E-0064 and 22-G-0065.

⁶⁰ KEDNY Direct Testimony of GIOP panel C & U, p. 15.

1 or for which alternative decarbonization technologies do not exist – the
2 specific applications for which these fuels should strategically be reserved.
3 This will make it harder for New York to meet the economy-wide CLCPA
4 requirements at reasonable cost.

5 **Q. What other concerns do you have about the Companies’ reliance on**
6 **hydrogen as part of their strategy for complying with the CLCPA?**

7 A. National Grid intends to partly replace fossil natural gas with “green
8 hydrogen” and describes it as having enormous potential as a source of clean
9 energy. However, hydrogen has recently been determined to have a larger
10 global warming potential (GWP) than was previously understood, with experts
11 now estimating a 20-year GWP of hydrogen between 22.2 and 52.4, with a
12 central value of 37.3.⁶¹ The same study found that the 100-year GWP
13 (GWP100) of hydrogen is 8.8 to 14.4, with a central value of 11.6. Unlike
14 earlier studies that estimated lower central GWP values for hydrogen, newer
15 studies included the combined effects in the troposphere and stratosphere using
16 global 3D models, which revealed the higher GWP. This increased estimate
17 raises concerns whether reliance on hydrogen will enable National Grid to
18 achieve CLCPA targets.⁶²

⁶¹ Sand, M., Skeie, R.B., Sandstad, M. et al. A multi-model assessment of the Global Warming Potential of hydrogen. *Commun Earth Environ* 4, 203 (2023). <https://doi.org/10.1038/s43247-023-00857-8>.

⁶² Id.

1 Hydrogen is assumed to be a green option because it would be produced using
2 renewable energy, but it is unlikely to have zero GHG emissions. The potential
3 for leaks limits the GHG benefits from hydrogen. While combustion of
4 hydrogen would not produce carbon dioxide, hydrogen's GWP matters
5 because hydrogen will leak from pipes and end-use equipment, just as methane
6 leaks from the existing gas system. As a very small molecule, hydrogen leak
7 rates will be higher than those for methane in the same pipe or equipment.
8 Additionally, the combustion of hydrogen creates significant local air pollution
9 from nitrogen oxides, which pose a human health risk.⁶³

⁶³ Cellek, M. and Pınarbaşı, A. Investigations on performance and emission characteristics of an industrial low swirl burner while burning natural gas, methane, hydrogen-enriched natural gas and hydrogen as fuels. *International Journal of Hydrogen Energy* 43, 2 (2018). <https://doi.org/10.1016/j.ijhydene.2017.05.107>.

1 It appears that KEDLI intends to generate hydrogen using power from the grid
2 to back up local renewables. It is important to ensure that the electricity
3 operating the electrolyzers to create hydrogen is actually renewable. Use of
4 fossil generation to power hydrogen production could increase, or even greatly
5 increase, GHG emissions.⁶⁴ To avoid such outcomes, grid-connected
6 electrolysis should be held to standards regarding additionality, deliverability,
7 and hourly matching.⁶⁵

8 **Q. Do you have similar concerns about emissions associated with RNG?**

9 A. Yes. Some types of RNG are not low-emissions. The wastewater treatment
10 RNG that the Companies are seeking to procure may only provide slight
11 reductions in emissions relative to fossil gas.⁶⁶ And if RNG methane leaks
12 from pipes, it has the same potential for climate damages as fossil gas.

13 Likewise, similar to the emissions when fossil gas is burned, the combustion of
14 RNG results in emissions of criteria pollutants, which have negative health
15 impacts.

⁶⁴ See Joint Comments to Department of the Treasury re Implementation of the IRA 45V clean hydrogen tax credits as it relates to guidelines for emissions accounting of grid-connected electrolyzers, <https://www.nrdc.org/sites/default/files/2023-03/joint-letter-45v-implementation-20230223.pdf>.

⁶⁵ Id. See also, Ricks, Wilson, Xu, Qingyu, & Jenkins, Jesse D. (2023). Minimizing emissions from grid-based hydrogen production in the United States. Environmental Research Letters. <https://iopscience.iop.org/article/10.1088/1748-9326/acacb5/meta>; Zeyen, Elisabeth, Riepin, Iegor, & Brown, Tom. (2022). Hourly versus annually matched renewable supply for electrolytic hydrogen (0.1). Zenodo. <https://doi.org/10.5281/zenodo.7457441>.

⁶⁶ See, e.g., ICF. 2019. Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment.

1 **Q. Will the Companies' proposal to invest in RNG interconnection deliver**
2 **GHG emission reductions to their customers?**

3 A. No. Despite suggestions to the contrary,⁶⁷ the proposal will not deliver
4 emission reduction benefits associated with the environmental attributes of the
5 RNG to customers. The Companies are not proposing to retain or purchase any
6 renewable energy credits or other environmental attributes associated with the
7 methane from the RNG facility.⁶⁸ Because the Companies are not retaining or
8 purchasing these attributes, neither the Companies nor their customers can
9 claim credit towards compliance with state climate policy. If out-of-state
10 entities purchase these attributes, these buyers can claim the emissions
11 reductions towards their obligations, and New York would not benefit.
12 However, the Companies' customers would still be on the hook for the cost of
13 the interconnection facility.⁶⁹

⁶⁷ The Companies claim that these projects will result in downstream and upstream emissions reductions. (KEDLI Direct Testimony of GIOP, p. 77; KEDNY Direct Testimony of GIOP panel, p. 79-81)

⁶⁸ KEDNY Direct Testimony of GIOP panel, p. 81-83.

⁶⁹ For comparison, on the electric side, the Clean Energy Standard obligates load-serving entities to procure renewable energy certificates (RECs) for their retail customers. Use of the RECs for compliance effectively retires the REC. If an LSE sells RECs to another party, the LSE and its customers forfeit the ability to make any claims about using renewable energy. (US Environmental Protection Agency. Renewable Energy Certificate Monetization. Available at: <https://www.epa.gov/greenpower/renewable-energy-certificate-monetization>)

1 **4.3.2. Advanced Leak Detection**

2 **Q. Do you have other comments on proposed investments to support policy**
3 **compliance?**

4 A. Yes. As noted above, the Companies are considering changes to the Advanced
5 Leak Detection program, including use of satellite imagery.⁷⁰ However, there
6 are reasons to be skeptical of implementing this unproven technology. In the
7 District of Columbia, Washington Gas Light’s (WGL) program using satellites
8 for leak detection was dismally inaccurate. The Public Service Commission of
9 The District of Columbia found that WGL’s use of satellite technology was
10 only 20.51 percent accurate in finding leaks that were backed up by a ground-
11 based survey.⁷¹ Accordingly, the New York Public Service Commission
12 should be wary of proposals to implement satellite-based technology.

⁷⁰ Direct Testimony of Gas Safety Panel p. 22-24.

⁷¹ Public Service Commission of The District of Columbia, Order in Formal Case No. 1154. March 10, 2023.
Available at: <https://edocket.dcpssc.org/apis/api/Filing/download?attachId=187364&guidFileName=dc591ab7-78f0-445c-8a98-512e431e6188.pdf>.

1 **5. CONCERNS WITH OTHER ASPECTS OF THE COMPANIES’**
2 **PROPOSAL**

3 **5.1. LPP Performance Incentives**

4 **Q. Do you have concerns with the proposed performance incentive for PMR**
5 **unitary cost?**

6 A. Yes. This proposed incentive would provide another incentive motivating the
7 Companies to increase investment in the gas system rather than reduce it. The
8 Companies already have strong incentives to put into rate base and earn a
9 return on the new pipes that replace LPP. This proposed incentive would
10 provide the Companies with rewards to make investments that they are already
11 making. And critically, these investments are likely not in the public interest.

12 **Q. Do you have concerns with the proposed negative performance incentive**
13 **for not meeting LPP minimum targets?**

14 A. Yes. Similar to the proposed unitary cost incentive, a negative incentive for
15 failure to achieve LPP targets would provide the Companies with stronger
16 incentives to make investments that they are already making and that are likely
17 not in the public interest.

1 **Q. Why do you say the proposed incentives would reward the Companies for**
2 **investments that are likely not in the public interest?**

3 A. If implemented, the proposed incentives will encourage the Companies to meet
4 and exceed the proactive LPP replacement thresholds. These thresholds and
5 LPP replacement in general support keeping the distribution system as is,
6 rather than retiring pipes by electrifying or otherwise addressing the connected
7 loads. As discussed earlier in this testimony, investments that keep the existing
8 gas distribution system at the current scale are at odds with the state's
9 decarbonization policy, will put unreasonable costs on customers, and could
10 trigger a rate crisis.

11 **Q. What do you recommend?**

12 A. The Companies' proposed incentive mechanisms should not be approved.
13 Instead, to reorient the Companies toward a pathway that is aligned with
14 decarbonization targets, the Companies should limit its incentive mechanisms
15 to those for 1) leak detection and repair and 2) successful implementation of
16 NPAs.

1 **5.2. Term of Rate Plan**

2 **Q. Earlier, you noted that the Companies provided a proposal for the Rate**
3 **Year plus three years of data to facilitate settlement. What would the**
4 **impact of a four year term be?**

5 A. A longer term, such as four years, would serve to cement the Companies’
6 proposed strategy, making it more difficult and more expensive to change
7 course. In the interim, the Companies will replace more LPP, and gas
8 customers may replace end-use equipment in-kind based on messaging from
9 the Companies that they plan to continue using the existing distribution system
10 using lower carbon fuels. Customers who install heat pumps are less likely to
11 install ones that will serve their full building heating loads, adding expense
12 later on when the existing gas backup systems reach the end of their useful life,
13 and the size of the heat pump needs to be increased to serve the full heating
14 load. In this way, the transition to the options that are aligned with CLCPA
15 targets (including full building electrification) would become more costly
16 overall, and especially for those facing high barriers to electrification.

17 The final strategy for decarbonizing the Companies’ load will almost certainly
18 differ from what National Grid outlined in its CLCPA study or the CEV, since
19 the Companies have not completed their Long-Term Gas Plan and the related

1 process, and the Department of Environmental Conservation has yet to
2 promulgate sector-specific reduction mandates pursuant to the CLCPA.

3 **Q. What do you recommend regarding the term of the rate plan?**

4 A. If the PSC approves a rate plan, it should be for one or two years only.

5 **Q. Does this conclude your testimony?**

6 A. Yes.