BEFORE THE NEW YORK STATE
PUBLIC SERVICE COMMISSION

In the Matter of a Review of the Long-Term Gas System Plans of Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc.	)	**Case 23-G-0147**

COMMENTS OF SIERRA CLUB AND EARTHJUSTICE ON THE INITIAL GAS SYSTEM LONG-TERM PLAN OF THE CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. AND ORANGE & ROCKLAND UTILITIES, INC.

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Sierra Club and Earthjustice ("Commenters") respectfully submit the following comments on the initial long-term plan ("LTP") of Consolidated Edison Company of New York, Inc. ("Con Ed") and Orange and Rockland Utilities, Inc. ("Orange & Rockland") (collectively, "the Companies"). As detailed below, the Companies should adopt as their long-term plan the Deep Electrification pathway but make certain modifications explained below in order to maximize financial and environmental benefits while also minimizing risk to their customers. The Companies should reject the proposed Hybrid pathway, which relies on unrealistic assumptions regarding low-carbon fuels and will continue the State's reliance on the gas distribution system at significant financial risk to customers and health risk to New Yorkers. In addition, in developing the LTP, the Companies failed to assess viable industrial decarbonization opportunities and ignored the opportunity to significantly scale up their Non-Pipeline Alternative ("NPA") program. Instead, the Companies pursue a costly Main Replacement Program which will inevitably lead to stranded assets for the remaining customers on the gas system. Finally, the LTP fails to comprehensively assess the impacts of the LTP on disadvantaged communities in the Companies' service territories.

As a result of these deficiencies, the LTP is inconsistent with the Companies' obligations under the Public Service Commission's Gas Planning Order and prevents the Companies' achievement of deeper emission reductions required by 2050 under New York's climate law. In subsequent modeling used to revise this initial LTP, the Companies must address these shortcomings, be more transparent with their assumptions and correct the inaccurate assumptions detailed below, including by incorporating the specific recommendations identified in the attached comments by Strategen.

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I. BACKGROUND

A. The CLCPA Requires Steep Greenhouse Gas Emission Reductions and an Equitable Transition to a Clean Energy Economy.

Recognizing that "[c]limate change is adversely affecting economic well-being, public health, natural resources, and the environment of New York," in 2019 the Legislature passed the Climate Leadership and Community Protection Act to strengthen and codify New York's statewide mandates for emissions reductions and require the accelerated adoption of renewable energy. 2019 Sess. Laws of N.Y. Ch. 106 (S. 6599) § 1 (hereinafter "CLCPA"). The Legislature enacted the CLCPA to mitigate the existing harms of climate change and prevent even greater harm in the future. *Id*. § 2(a) ("The severity of current climate change and the threat of additional and more severe change will be affected by the actions undertaken by New York and other jurisdictions to reduce greenhouse gas emissions.").

Across all sectors of the economy, the CLCPA requires that by 2030, greenhouse gas ("GHG") emissions be reduced 40% from the level they were at in 1990, and that by 2050 emissions be reduced 85% from the 1990 level. ECL § 75-0107(1)(a)–(b). The CLCPA also codified the goal of achieving net zero emissions by 2050. *Id*. § 75-0109(4)(a)–(b); CLCPA § 4. For the electric sector specifically, the CLCPA mandates that 70% of electricity demand be met by renewable energy by 2030 and that the electric demand system in New York be zero-emission by 2040. PSL § 66-p(2)(a)–(b).

In addition to requiring the state to rapidly reduce greenhouse gas emissions, the CLCPA contains a number of provisions to ensure an equitable transition to a clean energy economy. The statute directs state agencies to ensure that at least 35% of the benefits of clean energy and energy efficiency funding accrues to disadvantaged communities. ECL § 75-0117. The CLCPA defines disadvantaged communities as "communities that bear burdens of negative public health

effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate- income households" and tasks a new entity called the Climate Justice Working Group ("CJWG") with developing criteria to identify such communities. ECL §§ 75-0101(5), 75-0111(1)(b).

In October 2021, New York State identified interim disadvantaged communities that could be used until the CJWG identified the communities that qualify as "disadvantaged" for purposes of the CLCPA.[1] The CJWG then issued draft disadvantaged community criteria in December 2021 and held a public comment period from March 9 to August 5, 2022.[2] The CJWG issued the final disadvantaged community criteria on May 27, 2023, after more than two years of deliberation.[3] New York State has also developed a map of disadvantaged communities based on the final criteria.[4]

The final list of disadvantaged communities encompasses census tracts that scored in the top 28.9% of their regional or statewide percentile rank based on a combination of forty-five health, climate, environmental, and demographic indicators.[5] Additionally, for purposes of meeting the 35% investment floor only, disadvantaged communities include any households reporting annual total income at or below 60% of State Median Income or that are otherwise categorically eligible for low-income programs.[6]

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[1] *See* Notice of Denial of Title V Air Permit: Astoria Gas Turbine Power – Astoria, Queens County (Oct. 27, 2021) at 17, *available at* https://www.dec.ny.gov/docs/permits_ej_operations_pdf/nrgastoriadecision102721.pdf.
[2] *Disadvantaged Communities Criteria*, N.Y. State, (2023), https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria.
[3] *Id*.
[4] *Id*.
[5] N.Y. Dep't Env't Conservation, *Climate Justice Working Group Meeting*, at slides 19, 28 (Mar. 23, 2023), https://climate.ny.gov/-/media/Project/Climate/Files/CJWGMeeting03272023Presentation.pdf.
[6] *Id*. at slide 13.

B. The Climate Action Council's Scoping Plan Affirms the Need to Downsize the Gas System and Rapidly Electrify New York's Building Sector.

The CLCPA created a new entity called the Climate Action Council tasked with developing a Scoping Plan to provide a roadmap for New York to meet the statute's requirements. ECL § 75-0103. Following nearly two years of input from technical advisory panels, the Climate Justice Working Group, and members of the public, the Climate Action Council finalized and approved its Scoping Plan in December 2022. Recognizing that on-site fuel combustion in residential, commercial, and industrial buildings currently generates 32% of New York's total GHG emissions,[7] the Scoping Plan reflects the need to rapidly move away from fossil fuel combustion and towards electrifying buildings to meet the CLCPA's greenhouse gas reduction requirements. The Scoping Plan recommends that New York prohibit fossil fuel combustion in new construction after 2025 for buildings that are three stories or fewer, and after 2028 for larger buildings, benchmarks that Governor Hochul has adopted by including the All-Electric Building Act in her executive budget.[8]

The Scoping Plan confirms the need to downsize the gas distribution system in the coming years.[9] The Climate Action Council recommends utility-specific forecasts for reducing gas sales, decreasing the number of gas customers over time and applying greater scrutiny to investments in the gas distribution system to ensure that investments do not result in stranded assets that make it even more expensive to reduce greenhouse gas emissions in the future.[10]

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[7] N.Y. State Climate Action Council, *New York State Climate Action Council Scoping Plan* 175 (Dec. 2022), https://climate.ny.gov/resources/scoping-plan/ (hereinafter "Scoping Plan").
[8] Scoping Plan at 187; FY 2024 New York State Executive Budget: Transportation, Economic Development and Environmental Conservation Article VII Legislation, at 254 (Jan. 31, 2023), https://www.budget.ny.gov/pubs/archive/fy24/ex/artvii/ted-bill.pdf.
[9] *Id.* at 350.
[10] *Id.* at 360, 362.

The Scoping Plan pairs downsizing the gas distribution system with electrification, envisioning that by 2030, one to two million energy-efficient homes will be electrified with heat pumps and that heat pumps will provide space heating and cooling for 10 to 20% of commercial space statewide.[11] Additionally, the Scoping Plan specifies that the majority of new purchases for space and water heating should be heat pumps starting this decade, and from 2030 on, more than 250,000 homes should be retrofitted or constructed to be energy-efficient and ready to install heat pumps for heating, cooling, and hot water.[12] The Scoping Plan also determined that by 2050, 85% of homes and commercial spaces should be electrified with efficient heat pumps and thermal energy networks.[13]

The Scoping Plan also sets out benchmarks that existing buildings must meet to achieve the CLCPA's requirements, which make clear that in the coming years the State must move away from reliance on gas. Specifically, the Scoping Plan calls for phasing out fossil fuel combustion in existing buildings by prohibiting the replacement of fossil fuel combustion equipment, requiring the installation of non-fossil fuel alternatives instead, beginning by the following dates:

- By 2030: no replacement of residential equipment for fossil fuel combustion for heating, cooling, and hot water;
- By 2035: no replacement of large equipment for fossil fuel combustion for heating, cooling, and hot water;

[11] Scoping Plan at 179. Governor Hochul has also announced a plan to achieve two million electrified or electrification-ready homes by 2030. *See* NYSERDA, Press Release, Governor Hochul Announces Plan to Achieve 2 Million Climate-Friendly Homes by 2030 (Jan. 5, 2022), https://www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-01-05-Governor-Hochul-Announces-Plan-to-Achieve-2-Million-Climate-Friendly-Homes-By-2030.
[12] Scoping Plan at 179.
[13] *Id*. at 180.

- By 2035: no replacement of fossil fuel equipment for cooking and clothes drying.[14]

C. The Gas Planning Order Requires Utilities to Take Ambitious Steps Towards Meeting CLCPA Targets.

The Public Service Commission ("PSC" or "Commission") initiated the Gas Planning Proceeding with an eye towards "the need to reduce the emissions associated with gas delivery systems in order to support the achievement of the CLCPA's GHG emissions targets."[15] The PSC's May 12, 2022 Gas Planning Order ("the Gas Planning Order") requires utilities such as the Companies to develop twenty-year plans that forecast demand and set forth how the utility will address demand, and take steps towards meeting the CLCPA's greenhouse gas reduction and equity mandates.[16]

The Gas Planning Order provides that "planning must be conducted in a manner consistent with the [CLCPA]."[17] Although the Gas Planning Order was issued before the Climate Action Council approved the final Scoping Plan, the PSC "recognize[d] the role of natural gas in greenhouse gas ("GHG") emissions and [took] action in this proceeding to prepare for the [Climate Action Council] recommendations to the benefit of all New Yorkers."[18] The Gas Planning Order accordingly "set up a flexible planning process that can incorporate the [Climate Action Council] recommendations when they are finalized, while requiring [local distribution companies] to develop plans to limit infrastructure build."[19] The PSC described the Gas Planning Order as establishing "a foundational process through which the Commission can act to ensure

[14] *Id.*at 190.
[15] Order on Implementation of the Climate Leadership and Community Protection Act at 24, NY PSC Case No. 22-M-0149 (May 12, 2022) (hereinafter "CLCPA Order").
[16] *See generally* Order Adopting Gas System Planning Process, NY PSC Case No. 20-G-0131 (May 12, 2022) (hereinafter "Gas Planning Order").
[17] *Id.* at 4.
[18] *Id.* at 5.
[19] *Id.*at 19.

that the [local distribution companies] reduce GHG emissions in accord with the CLCPA and in contemplation of the [final Scoping Plan]."[20] In issuing the Gas Planning Order, the PSC recognized that "rationally, meeting the CLCPA's emissions targets for the entire economy will require emissions reductions from the gas distribution system."[21] According to the Gas Planning Order, the gas planning process "aligns" with the Climate Action Council's determination that greater scrutiny of investments in traditional gas infrastructure "is warranted to ensure that utilities do not exacerbate the problem of stranded assets and make it more expensive to fully decarbonize the fossil gas sector."[22] The PSC recently affirmed that the gas planning process should ensure that gas utilities "reduc[e] gas infrastructure and GHG emissions in a manner consistent with the CLCPA."[23]

To that end, the Gas Planning Order provides that each LTP must include at least one "no infrastructure" option "in which the utility would include a mix of demand response measures and other non-pipes alternatives" unless the utility can show that a "no infrastructure" scenario is not feasible for a particular project or portion of its long-term plan.[24] NPAs include electrification and load-reducing measures such as energy efficiency that can avoid the need for new investments. As the PSC has recognized, NPAs are more consistent with the CLCPA targets than building new infrastructure.[25] In the recent Con Edison 2023 rate case, the PSC affirmed that "[t]he long-term plan must include clear quantitative and qualitative explanations for why Con Edison made a particular choice between traditional capital projects and any NPAs,

[20] *Id.* at 57.
[21] *Id.* at 4.
[22] *Id.* at 19.
[23] Order Adopting Terms of Joint Proposal and Establishing Electric and Gas Rate Plans with Additional Requirements at 92, PSC Case No. 22-G-0065 (July 20, 2023) (hereinafter "Order Adopting Joint Proposal")
[24] Gas Planning Order at 35, 36–37.
[25] *Id.* at 36.

including [benefit cost analyses] and, for each alternative considered, an evaluation of estimated bill impacts, the net present value of estimated costs, and emissions impacts."[26]

The Gas Planning Order also directs utilities, in their long-term plans, to identify disadvantaged communities in their service territories and explain the impacts on those communities of any proposed projects.[27] The Gas Planning Order further provides that a long-term plan must explain how the utility will ensure that an appropriate portion of the benefits of any NPAs—such as energy efficiency, demand response, and electrification—flow to disadvantaged communities.[28] The PSC further explains in the Con Edison 2023 rate case that "the Gas Planning Proceeding . . . will ensure that the State's gas delivery utilities provide uniform information about GHG emissions and disadvantaged communities" and that "factors in determining whether to replace [leak-prone pipes] or implement an NPA, such as health impacts from the use of natural gas" should be "raised in the Gas Planning Proceeding."[29]

II. THE COMPANIES SHOULD PURSUE THE DEEP ELECTRIFICATION PATHWAY, WITH MODIFICATIONS TO NEAR TERM CAPITAL EXPENDITURES ON PIPE REPLACEMENT, TO MAXIMIZE BENEFITS AND MINIMIZE RISKS TO THEIR CUSTOMERS

In their initial LTP, the Companies appropriately recognize the need to comply with the CLCPA's mandates and downsize their gas system. They acknowledge that their commitments will require them to "reimagine" their gas delivery system, including, among other things, achieving "substantial reductions" in gas consumption, "significant growth" in electric heating and "meaningful increases in overall building efficiency," while "shrinking the geographic scope of the gas delivery system to focus on serving customers with substantial challenges to heating

[26] Order Adopting Joint Proposal at 110.
[27] Gas Planning Order at 40.
[28] *Id.*
[29] Order Adopting Joint Proposal at 94, 110–11.

electrification."[30] The Companies also recognize the tension between current subsidies for gas line extensions (the so-called 100-ft. rule) and the need to reverse the growth in gas customer base to comply with the CLCPA.[31] And they identify the pursuit of NPAs as necessary to mitigate the need for gas infrastructure investment.[32]

Despite the Companies' apparent recognition of the need to accelerate electrification and downsize the gas distribution system, they have put forth an initial plan that is disturbingly agnostic about the approach they take. The Companies identify two widely divergent pathways—a Deep Electrification pathway that prioritizes widespread electrification and a Hybrid pathway that prioritizes low-carbon fuels—yet indicate that they "are not expressing a preference for either the Hybrid or Deep Electrification pathway for development through this [LTP]."[33] At the June 21 stakeholder meeting, the Companies explained that the two pathways represent bookends for long-term planning and that the scenario they pursue will depend on how technology and costs change in the future. Such an approach is unworkable.

While the Companies are correct that "uncertainty in the trajectory of technology, policy, and customer adoption" necessitates some degree of planning flexibility,[34] as Strategen explains, "the Companies should focus on making investments that minimize costs and regret."[35] Here, the Deep Electrification and Hybrid pathways are largely incompatible with one another, and it is not possible to pursue both in a cost-effective manner. Continuing to make substantial capital investments in a system that the Companies acknowledge is likely to shrink substantially is expensive and highly risky. The expense and risk are particularly acute for pipe replacements,

[30] Gas System Long-Term Plan at 2, NY PSC Case No 23-G-0147 (May 31, 2023) (hereinafter "Initial LTP").
[31] *Id.* at 5.
[32] *Id.*
[33] *Id.* at 4.
[34] *Id.* at 2.
[35] Strategen, Sierra Club & Earthjustice, A Review of Consolidated Edison and Orange & Rockland's Initial Long-Term Plan at 4, NY PSC Case No. 23-G-0147 (Aug. 21, 2023) (hereinafter "Strategen").

which, as discussed below in Section VI, should be avoided and minimized either through non-pipe alternatives or far less costly repairs. Indeed, systematically replacing gas pipes as if the system is going to remain at its current size for the next eighty years is the *least cost-effective* way to proceed. In addition, as explained below and in the accompanying comments by Strategen, relying heavily on low-carbon fuels to accomplish necessary decarbonization is fraught with risk and uncertainty.

As detailed in Strategen's comments, the Companies' Deep Electrification pathway is generally a more prudent approach than the Hybrid pathway, although it should be further refined to minimize capital investments in an increasingly obsolescent gas pipeline system. As an initial matter, only the Deep Electrification pathway pursues emission reductions at a rate commensurate with what is required by the CLCPA. Whereas the Hybrid pathway achieves only a 61% reduction in emissions between 2022 and 2042, the Deep Electrification pathway would achieve an 82% reduction,[36] much more in line with the economy-wide 85% reduction off a 1990 baseline required by the CLCPA.

The Deep Electrification pathway is also more consistent with the Climate Action Council's final Scoping Plan than is the Hybrid pathway. As Strategen explains, the Deep Electrification pathway takes the first step toward the final Scoping Plan's recommendation that 85% of homes and commercial space be electrified through heat pumps and thermal energy networks by 2050.[37] It also tracks more faithfully with the Governor's commitment to electrify one million homes and make another million homes electrification ready by 2030.[38]

[36] Initial LTP at 4.
[37] Strategen at 9.
[38] N.Y. Gov. Kathy Hochul, *Achieving the New York Dream: 2023 State of the State* 121 (Jan. 2023).

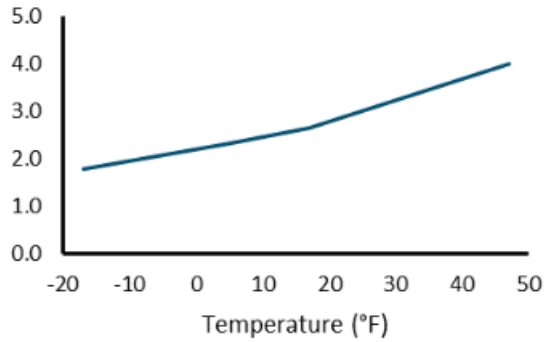
Finally, as Strategen shows, the Deep Electrification pathway "presents a lower-risk approach for decarbonization."[39] This pathway relies on "existing and mature" electrification technologies like heat pumps[40] rather than the speculative fuels discussed in Section IV. In addition, electric appliances, including heat pumps, are heavily incentivized through the Inflation Reduction Act,[41] further mitigating the risk of an electrification-based pathway. And their cost-effectiveness compared to gas appliances is likely to improve in the future as heat pump performance and cost-effectiveness continue to improve.[42] As Strategen documents, significant investments are being made in research and development that are already paying dividends; in response to the Department of Energy Residential Cold Climate Heat Pump Challenge, Trane demonstrated heat pump performance at temperatures as low as -23 degrees Fahrenheit.[43] Indeed, as PA Consulting observes in its Initial Report, the Companies' modeling does not adequately account for the evolving competition between the economics of gas appliances and electric appliances, which PA views as "a potentially very important dynamic feedback loop" because it "links electrification to reduced gas volumes and to increased gas retail rates, and the impact of evolving gas and electric rates on economics of various appliances (e.g., heat pumps) on customers' switching decision."[44]

The Companies' modeling of heat pumps also understates their capabilities in several important ways that, when corrected, further solidify Deep Electrification as the preferable pathway. First, as Strategen documents, the Companies' assumptions regarding heat pump

[39] Strategen at 9.
[40] *Id.*
[41] *Id.*
[42] *Id.* at 10.
[43] *Id.*
[44] PA Consulting Grp., *Initial Report – NY Long Term Gas Planning* at 11, 38, 43, NY PSC Case No. 23-G-0147 (July 14, 2023) (hereinafter "PA Initial Report").

coefficients of performance ("COP") are "not in line with the best available data."[45] While the Companies assume a range of 2 to 2.9 for average heat pump COP, cold climate heat pump COP exceeds 3 over a wide range of temperatures, as illustrated in the figure below.

Figure 1: Cold Climate Heat Pump COP[46]



The underestimation of heat pump COP is particularly concerning given that average temperatures across the winter season are above 30 degrees Fahrenheit in New York City, temperatures at which cold climate heat pump COPs exceed the range identified by the Companies.[47]

Further, as Strategen explains, the Companies' failure to assume any increase in heat pump performance over the time period of this long-term plan is "an unreasonable assumption that is incongruous with the historical development of heat pump technology."[48] Indeed, heat pump performance "has steadily improved over the last fifty years," and the ability of heat pumps to accommodate cold weather heating needs is likely to be "accelerated" due to an influx of public and private funding for technological innovation.[49]

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[45] Strategen at 11.
[46] Tory Clark et al., Energy & Env't Econ., *BGE Integrated Decarbonization Strategy* 70 (Oct. 2022), https://www.ethree.com/wp-content/uploads/2022/10/BGE-Integrated-Decarbonization-White-Paper_2022-11-04.pdf.
[47] *See* Strategen at 13.
[48] *Id*.
[49] *Id.*

Overall, the Deep Electrification pathway is a low-risk approach to decarbonizing the Companies' gas system and the only approach that is reasonably calibrated to achieve the deep emission reductions necessitated by the CLCPA. However, to responsibly manage costs, the Companies' approach to pipe replacement must be modified even in this pathway. As Strategen explains, "[t]he Companies forecast significant spending over the next decade in all the examined scenarios," including the Deep Electrification pathway,[50] yet "the need for extensive delivery system infrastructure in the Deep Electrification pathway is incongruous with forecasted demand," which is projected to decline significantly during the planning period.[51] The Companies project a 78% reduction in gas throughput and a 62% reduction in customers between 2023 and 2042.[52] As Strategen notes, "[s]uch significant reductions should be accompanied by a reduction in the size of the system."[53] In the Companies' LTP, however, it is not. Through 2030, the Companies forecast $7 billion in new capital investments under the Deep Electrification pathway, only slightly below the $9 billion forecast for the same period in the Reference pathway, which assumes only a 22% reduction in gas throughput through 2042.[54]

Making large capital investments in a system with shrinking customer base and declining throughput is a not tenable approach. As Strategen explains, the need for the Companies to recover increasing capital costs over fewer therms and customers will result in rate increases and risk these assets becoming stranded.[55] While the former risk can be mitigated to some degree by modifying depreciation methods—e.g., using a units of production method rather than a straight-line depreciation method—that does not avoid the risk of asset stranding.[56]

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[50] Strategen at 16.
[51] *Id*.
[52] DPS-3-77 Att. 1 (Attached as Exhibit A)
[53] Strategen at 16.
[54] *Id*.
[55] *Id*. at 17.
[56] *Id*. at 18.

At the same time, as Strategen's comments detail, capital costs can be effectively managed while maintaining gas system reliability through the period of system downsizing. First, the Companies can evaluate and, where appropriate and cost-effective, pursue NPAs that do not necessitate long-lived capital investments in the pipeline system.[57] Second, where NPAs are not viable, the Companies can pursue cost-conscious pipeline repairs rather than expensive full pipe replacements. As Strategen notes, a recent study by the Washington D.C. Department of Energy and Environment "found that the utility's action to repairs the largest leaks in the study resulted in 'the one-time cost of these repairs to ratepayers to be between one tenth and one hundredth of the cost of pipeline replacement on that street.'"[58] "Such cost savings are critical in reducing customer rate impacts."[59]

The Companies must not delay taking meaningful actions to reduce the size of their investments in the pipeline system.[60] Instead, the Companies should immediately: (i) prioritize NPAs and repairs over pipeline replacements;[61] (ii) comply with Pipeline and Hazardous Materials Safety Administration Maximum Allowable Operation Pressure Reconfirmation regulations through pipeline derating and targeted pipe retirement;[62] and (iii) look to leverage NPAs as an alternative to public improvement projects.[63] The Companies should also take steps to deter oil-to-gas conversions, which are authorized for another five years under the Deep Electrification pathway despite the risk of creating stranded assets.[64] Until the obligation to serve

[57] See infra Section VI; Strategen at 18.
[58] Strategen at 18 (quoting Bob Ackley, Nathan Phillips, Wash. D.C. Dep't Energy Env't, *Strategic Electrification in Washington, D.C.: Neighborhood Case Studies of Transition from Gas to Electric-based Building Heating* (Dec. 14, 2022), https://edocket.dcpsc.org/apis/api/Filing/download?attachId=186471&guidFileName=a9254ec8-d08f-46ed-af0e-31b28d707139.pdf.).
[59] *Id.* at 18–19.
[60] *Id*. at 19.
[61] *Id.* at 20.
[62] *Id.* at 21.
[63] *Id.* at 22.
[64] *Id.*

is eliminated, Strategen suggests that the Companies "heavily incentivize oil customers to electrify."[65]

The final LTP should specify the Companies' intent to pursue the Deep Electrification pathway with the modifications regarding capital investments identified in Strategen's comments.

III. THE COMPANIES MUST BE MORE TRANSPARENT REGARDING THE ASSUMPTIONS USED TO DEVELOP THEIR LONG-TERM PLAN

The Companies' initial LTP also lacks critical detail regarding the assumptions that informed it. These assumptions should be clarified in the final LTP so that stakeholders and the public can understand how the Companies arrived at the conclusions they did. While Commenters have significant reservations regarding the substance of National Fuel Gas Distribution Corporation's ("NFG") recently filed Long-Term Plan, it bears note that NFG was more transparent regarding the assumptions that underpin its plan. NFG's plan was accompanied by a technical appendix (Appendix A) that included the assumptions NFG relied on regarding scenario inputs for energy efficiency (home energy reports and weatherization), electrification (broken down by residential, small commercial, and large multi-family, university, and industrial), industrial process energy efficiency, thermal energy networks, renewable natural gas, and hydrogen.[66]

Here, the Companies' Appendix B provides limited information about the technical assumptions underpinning the Plan. For example, for new business in the Hybrid pathway, the appendix simply states that "New business is assumed to continue through 2030, but at lower levels than the Reference Case."[67] Similarly, for oil-to-gas conversions in the Hybrid pathway,

[65] *Id.*
[66] Nat'l Fuel Gas Distrib. Corp. Final Long-Term Plan at App. A NY PSC Case No. 22-G-0610 (July 17, 2023).
[67] Initial LTP at App. B-2.

the appendix provides that "[o]il-to-gas conversions continue through 2030; however, some oil customers elect to electrify instead."[68]

Strategen's comments identify a number of substantive assumptions that should be detailed and explained in the final LTP. These include:

- Electrification measures cost curve
- Electrification measures energy use and performance in accordance with NEEP specifications
- Heat pump performance increase over the planning horizon
- Electrification incentive costs
- Electrification measure ramp rates
- Energy efficiency measure costs
- Energy efficiency measures energy savings
- Energy efficiency measures ramp rates[69]

In addition, given the impacts that the Deep Electrification pathway will have on the electric system, Strategen recommends detailing and explaining additional electric sector assumptions including:

- Electricity price forecast
- Annual electricity demand forecasts
- Peak demand forecasts for every summer and winter season[70]

Commenters request that the Companies identify and explain the assumptions they made regarding each of these measures and forecasts in the revised LTP.

[68] *Id.*
[69] Strategen at 15.
[70] *Id.*

IV. THE COMPANIES SHOULD REJECT THE HYBRID PATHWAY BECAUSE ITS RESTS ON UNREASONABLE ASSUMPTIONS ABOUT LOW-CARBON FUELS, WOULD NOT ACHIEVE NEEDED GHG CUTS, AND WOULD THREATEN PUBLIC HEALTH

The initial LTP, and in particular the Hybrid pathway, relies on combustion of alternative fuels including renewable natural gas ("RNG"), hydrogen, synthetic natural gas, and certified natural gas. Even if certain alternatives might reduce GHG emissions in the short term, they will not allow New York to achieve its climate mandates.[71] Because of financial and technological barriers, alternative combustion fuels do not provide a viable decarbonization pathway and will not lead to the necessary downsizing of the gas system. Additionally, using the distribution system in order to transport alternative combustion fuels will not achieve the GHG emission reductions required by the CLCPA, and will not address co-pollutants from combustion that threaten public health, especially in disadvantaged communities.

A. The LTP Contains Inaccurate Assumptions About the Costs and Availability of Alternative Fuels.

The initial LTP, especially the Hybrid pathway, unrealistically relies on alternative combustion fuels becoming available in sufficient quantities and at competitive prices. As the Companies acknowledge, if low-carbon fuels "do not materialize in a meaningful way, the gas system will need to be phased out in the long-term to achieve carbon neutrality."[72] Rather than rolling the dice on the risky proposition that alternative fuels will become widely available at competitive prices, the Companies should invest in electrification, a cost-effective and proven solution.

[71] The Commission has acknowledged as much, stating in the CLCPA Implementation Proceeding and the Con Ed rate case that RNG could serve "as a tool to reduce the carbon content of gas as the State implements strategies for long-term decarbonization and transition of the gas system, [and] to continue to meet the energy needs of hard to electrify customers." Order Adopting Joint Proposal at 127 (quoting CLCPA Order at 28).
[72] Initial LTP at 61.

Renewable Natural Gas

The Companies' initial LTP forecasts significant use of RNG, including 37% of 2042 supply in the Hybrid pathway and 13% of 2042 supply in the Deep Electrification scenario.[73] The Gas Planning Order concluded that the Scoping Plan recommendations should determine RNG's role in utilities' supply portfolios,[74] and the Scoping Plan treats RNG with caution, for good reason.[75] RNG is far too scarce and expensive to meet gas demand. Projected production costs for RNG produced in New York State range from $10 to more than $50 per million Btu ("MMBtu"), as compared to $3.50 to $5 per MMBtu for fossil gas.[76] A recent report found that replacing fossil gas with RNG across New York would cost ratepayers $25 billion annually on top of current gas expenses.[77] Moreover, the bioenergy feedstocks from which RNG is derived are limited; the amount of cropland needed to produce sufficient RNG to substitute for all fossil methane gas in New York would require twice the amount of cropland currently used in the state.[78] The LTP uses an average price of $19.26 per MMBtu for RNG, which rests on the assumption that the majority of the RNG used will come from landfill gas, the least expensive feedstock, without justifying that assumption.[79]

Additionally, the Companies unrealistically assume they can purchase "the full amount [of RNG] produced by anaerobic digestion in [their] service territories" and "their representative share of RNG produced by anaerobic digestion from the Mid-Atlantic and the rest of the Eastern

[73] *Id*. at 4.
[74] Gas Planning Order at 33–34.
[75] *See* Scoping Plan at 351 (noting that the availability of RNG is currently small and urging analysis of full lifecycle GHG and co-pollutant emissions impacts).
[76] Michael J. Walsh & Michael E. Bloomberg, Building Decarbonization Coal., *The Future of Gas in New York State*, 28 (Mar. 2023) (hereinafter "BDC Report").
[77] *Id.* at 40.
[78] *Id.* at 28, 41.
[79] Initial LTP at App. C-5.

U.S."[80] Specifically, in the Hybrid pathway, Con Edison anticipates sourcing 43.1 TBtu of RNG in 2042 while O&R forecasts sourcing 6.4 TBtu.[81] It is unreasonable for the Companies to project such high availability of RNG sources locally and from the Mid-Atlantic and Eastern United States. The Companies would fall well short of their RNG needs if other gas utilities pursue similarly aggressive RNG adoption, as they are likely to do. For example, National Grid's CLCPA study projects sourcing over 100 TBtu per year by 2040,[82] drawing from the entire Eastern United States, despite this representing several times more than National Grid's proportional share of theoretically available RNG in the East.[83] Nor would monopolizing all available RNG be sufficient. Acquiring all the RNG within the Companies' service territories would not even provide 10% of the Companies' projected 2042 fuel needs in the Hybrid pathway.[84] Furthermore, natural gas utilities are not the only industries vying for RNG; competition from other industries will impact both the available supply and the cost.

The Hybrid pathway also relies on the acquisition of RNG feedstocks that require thermal gasification for production, a resource that is not commercially available today. A 2019 American Gas Foundation report stated that "[t]here is considerable uncertainty around the costs for thermal gasification of feedstocks, as the technology has only been deployed at pilot scale to

[80] Initial LTP at 50.
[81] Initial LTP at App. C-7. Note: SC and EJ-2-11 Attachment 1 (attached as Exhibit B) displays different RNG usage from the initial LTP Appendix (39.3 TBtu for Con Edison and 5.7 TBtu for O&R in the Hybrid Pathway).
[82] *KEDNY/KEDLI and NMPC CLCPA Studies, Meeting #2 – Scenarios and Assumptions*, Slide 30 (Aug. 9, 2022), https://www.nationalgridus.com/media/pdfs/other/clcpa-study-final-presentation-materials-2nd-stakeholder-meeting-8-9-22.pdf.
[83] Using the American Gas Foundation's optimistic RNG forecast and National Grid's proportional share of gas consumption in the Eastern U.S., only approximately 40 TBtu of RNG would be available to National Grid's New York gas utilities. *See* Comments of Sierra Club at 4, PSC Case Nos. 20-E-0380 & 20-G-0381 (Dec. 7, 2022). Notably, even this 40 TBtu well exceeds the potential RNG projects the company identified through a national Request for Information. National Grid New York Climate Leadership and Community Protection Act Study at 31, NY PSC Cases 20-E-0380 & 20-G-0381 (Mar. 17, 2023).
[84] Strategen at 35.

date or in the advanced stages of demonstration at pilot scale."[85] Thermal gasification produces tar, which damages methanation equipment, acting as a barrier to commercialization.[86] Therefore, the Hybrid pathway represents a gamble not only on the availability of RNG but also on technological advances in thermal gasification that allow for the cost-effective procurement of RNG sources within the Companies' service territories.

Green Hydrogen

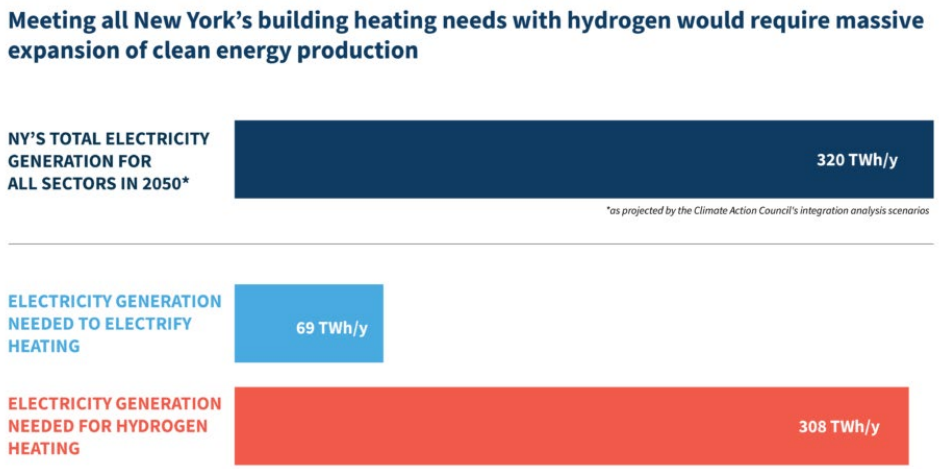
In the Hybrid pathway, the Companies would also employ significant amounts of green hydrogen, an expensive and scarce fuel. The Companies' initial LTP projects hydrogen prices to drop to an average of $9.31/MMBtu by 2031.[87] This projection is based on the DOE's Hydrogen Shot, an ambitious plan to reduce the cost of clean hydrogen to $1/kg by 2031, which the DOE acknowledges is based on "stretch" research and development goals—far from a guarantee.[88] Additionally, this price does not include the cost of system upgrades that would be needed to accommodate the high blending levels proposed by the LTP. ConEd forecasts acquiring 6.4 TBtu of hydrogen by 2042 in the Hybrid pathway, roughly equating to a 15% blend by volume.[89] Similarly, O&R forecasts roughly 15% blending by volume in 2042 in the Hybrid pathway.[90] These blends would require significant investments in system upgrades and increased operations and management spending to ensure the safe delivery of hydrogen.[91]

Even if green hydrogen's cost declines, it is inherently less cost-effective than electricity since the green hydrogen production process requires electricity as an input. Energy is lost in the

[85] Am. Gas Found., *Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment* 56 (Dec. 2019), https://gasfoundation.org/wp-content/uploads/2019/12/AGF-2019-RNG-Study-Full-Report-FINAL-12-18-19.pdf.
[86] Strategen at 36.
[87] Initial LTP at App. C-6.
[88] Strategen at 32.
[89] *Id*. at 30.
[90] *Id*.
[91] *Id*.

chemical reaction that produces hydrogen, and therefore, a significant expansion in renewable electric generation would be necessary to supply the hydrogen quantities the Companies forecast in the Hybrid pathway.[92] As demonstrated in the chart below, using electricity directly to power end use appliances is far more efficient than using electricity to create green hydrogen.

Figure 2: Efficiency of Electricity in Direct Use Versus Conversion to Green Hydrogen[93]



Synthetic Natural Gas

Although the LTP does not model any synthetic natural gas ("SNG") during the planning period, the Hybrid pathway indicates that SNG will be critical in achieving emissions reductions beyond 2042.[94] Due to the supply and technical limitations discussed above, the Companies cannot solely rely on hydrogen and RNG to meet customer demands in the Hybrid pathway, and SNG would be the only other fuel that could allow the Companies to decarbonize their entire gas networks through low-carbon fuels.

[92] *Id*. at 32.
[93] Olivia Prieto & Mike Henchen, *Low-Carbon Fuels Have a Limited Role to Play in New York's Buildings*, Rocky Mountain Inst. (May 25, 2022), https://rmi.org/low-carbon-fuels-have-a-limited-role-to-play-in-new-yorks-buildings/.
[94] Initial LTP at 3.

However, relying on advancements in SNG as the long-term solution for decarbonization is unreasonable because the fuel is in the early stages of technological development and is unlikely to become cost-competitive. SNG is produced through a process called methanation that combines green hydrogen, produced from renewable-powered electrolyzers, with carbon dioxide (CO_2), sourced from carbon capture technology.[95] None of these processes operate at scale today and only a handful of small-scale methanation pilots exist worldwide.[96] The Hybrid pathway is only viable if green hydrogen becomes cost competitive, carbon capture becomes cost competitive, the methanation process becomes cost competitive, and electricity prices are low.[97] As detailed in Strategen's comments, assuming that all four of these conditions will come to pass is highly speculative and risky, and therefore, the Hybrid scenario's reliance on SNG renders it infeasible.[98]

Certified Natural Gas

Finally, the Companies project the adoption of certified gas as a means for decarbonization in both the Hybrid and Deep Electrification pathways. Certified gas is fossil gas that theoretically has fewer upstream emissions. The end-use combustion of certified gas results in the same amount of emissions as non-certified fossil gas. Both the Hybrid and Deep Electrification pathways assume that certified gas becomes 100% of the fossil gas supply by 2033.[99] In the LTP, the Companies state that "[c]ertified gas reduces the upstream emissions factor associated with natural gas usage by 47%"[100] and only costs a premium of $0.10 per MMBtu,[101] a small fraction of the total cost of gas. However, there is no guarantee that certified

[95] Strategen at 38.
[96] *Id*.
[97] *Id*.
[98] *Id*.
[99] Initial LTP at App. C-7.
[100] *Id.* at 67.
[101] *Id.* at 52.

natural gas will be cost-effective, as evidenced by Con Edison's current pilot project to "determine if the certified natural gas market has developed enough to provide meaningful and verifiable emission reductions upstream of our gas distribution system *at a reasonable cost to customers*."[102] Even putting aside the lack of emissions benefits associated with certified natural gas (discussed below), it is not a cost-effective proposition.

B. The Production and Combustion of Alternative Fuels is GHG-Intensive and Will Not Achieve Climate Benefits.

The Companies cannot rely on alternative fuels without a meaningful assessment of the resulting climate impacts. The Scoping Plan specifies that before alternative fuels are considered for the gas system, it is important to ensure that "there are demonstrated . . . GHG benefits" and that "any use of alternative fuels, including green hydrogen and renewable natural gas, does not result in increased leaks and emissions within the entire life cycle of the development and use of alternative fuels."[103] The CLCPA requires the LTP to account for the gross lifecycle of GHGs associated with such fuels' production and use,[104] and the New York State Energy Research and Development Authority ("NYSERDA") has confirmed that combustion emissions from alternative fuels such as RNG must be accounted for when comparing emissions reductions with the CLCPA reduction mandates.[105] A full accounting will almost certainly show that the alternative fuels that the Companies rely on will actually not produce real climate benefits, and will only prolong the life of a gas system that needs to be substantially downsized.

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[102] Gas Infrastructure, Operations and Supply Panel Rebuttal Testimony at 63–64, NY PSC Case No. 22-G-006 (June 17, 2022) (emphasis added).
[103] Scoping Plan at 361.
[104] N.Y. Dep't Env't Conservation, 2022 Statewide GHG Emissions Report: Summary Report, 4 (2022), https://www.dec.ny.gov/docs/administration_pdf/ghgsumrpt22.pdf.
[105] NYSERDA, Fossil and Biogenic Fuel Greenhouse Gas Emission Factors 2, 5 (Sept. 2022), https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/22-23-Fossil-and-Biogenic-Fuel-Greenhouse-Gas-Emission-Factors.pdf.

Renewable Natural Gas

Because RNG is chemically identical to fossil gas,[106] its leakage and combustion emits the same level of GHGs. Additionally, RNG created from intentionally produced methane always results in net GHG emissions increases because of the inevitability of methane leakage during transport.[107] Leakage is likely to be even higher when RNG is transported from out of state. Truly capturable waste methane—for example, from landfills—represents less than one percent of gas demand, and therefore, intentional cultivation of an enormous amount of RNG would be required to fully decarbonize the Companies' gas supply.[108] And even landfill methane raises climate concerns because monetizing landfill gas creates the perverse incentive to increase the amount of organic waste in landfills (and therefore demand for additional landfill space), embedding subsequent pollution rather than addressing the root cause.

Arguments that RNG produces net zero GHG emissions are premised on the assumption that it is produced using methane that would otherwise be emitted through other means. In reality, the vast majority of RNG is intentionally cultivated through energy-intensive processes that emit GHGs and produce the risk of fugitive methane emissions.[109] Indeed, the initial LTP relies heavily on RNG produced through anaerobic digestion, which can incentivize unsustainable practices such as concentrated animal feeding operations that ultimately increase methane emissions.[110]

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[106] U.S. Dep't of Energy, *Natural Gas Fuel Basics*, Alt. Fuels Data Ctr., https://afdc.energy.gov/fuels/natural_gas_basics.html. (last visited Aug 15, 2023).
[107] Emily Grubert, *At Scale, Renewable Natural Gas Systems Could Be Climate Intensive: The Influence of Methane Feedstock and Leakage Rates*, 15 Env't Rsch. Letters 084041, at 4 (2020), https://doi.org/10.1088/1748-9326/ab9335.
[108] Sasan Saadat, Matt Vespa, & Mark Kresowik, Earthjustice & Sierra Club, *Rhetoric vs. Reality: The Myth of "Renewable Natural Gas" for Building Decarbonization* 9 (July 2020).
[109] BDC Report at 33–34.
[110] *Id.*; Initial LTP at 50.

Additionally, the initial LTP would incorporate a significant amount of RNG produced out-of-state, which achieves no GHG reductions for purposes of the CLCPA. As discussed above, a small portion of the RNG potential that the Companies count on originates in New York State. New York's GHG emissions accounting system attributes any avoided emissions from the use of RNG to the sector that provided the RNG feedstock, and attributes net emissions to the sector in which the RNG is combusted.[111] Any emissions reductions achieved through the use of RNG produced out of state therefore cannot count towards the Companies' GHG reduction goals because the emissions accounting system that the State uses to measure and enforce the CLCPA's GHG limits only reflects emissions reductions that occur in New York.[112]

Green Hydrogen

Nor can hydrogen achieve the decarbonization required. Only very low levels of hydrogen can be blended into natural gas systems. In 2022, the California Public Utilities Commission ("CPUC") completed a hydrogen blending feasibility study that involved a literature review, modeling, and experimental work.[113] The study confirmed that hydrogen causes embrittlement and blistering of cathodically sealed pipes[114] and even synthetic pipes show deteriorating performance with increased hydrogen blending. The study found limitations in material integrity for mixtures of 20% hydrogen by energy.[115] Based on the analyses conducted, the CPUC concluded that a "systemwide blending injection scenario becomes concerning as

[111] N.Y. Dep't Env't Conservation, New York 2022 Statewide GHG Emissions Report: Summary Report, at 4 (2022).
[112] *Id*.
[113] Miroslav Penchev et al., Univ. of Cal., Riverside, *Hydrogen Blending Impacts Study Final Report* 2 (July, 18, 2022), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF.
[114] *Id.* at 16–17.
[115] *Id.* at 3.

hydrogen blending approaches 5% by volume,"[116] far lower than the 15% proposed for the Hybrid pathway scenario.[117]

The result is that hydrogen blending would have a minimal impact, if any, on overall GHG emissions.[118] Additionally, the vast majority of hydrogen in the United States is gray hydrogen produced by the energy-intensive process of steam methane reformation, which emits significant GHGs.[119] Less than one percent of hydrogen is produced via electrolysis and only about 0.02% qualifies as green hydrogen, meaning that it is produced from electrolysis powered purely by renewable electricity.[120] Green hydrogen production is currently limited to demonstration projects, with projects "mostly in the single-digit MW scale,"[121] and a recent analysis found that U.S. companies are falling short of the Department of Energy's goals for hydrogen production.[122] Moreover, as discussed above, green hydrogen production is inherently energy-intensive and far less efficient than using electricity directly. The minimal green hydrogen in production should be conserved for use in sectors that cannot be electrified, not blended with gas to be combusted in New Yorkers' homes.[123]

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[116] *Id.* at 4.
[117] Strategen at 31.
[118] Miroslav Penchev et al., *supra* note 113.
[119] Sasan Saadat & Sara Gersen, Earthjustice, *Reclaiming Hydrogen for a Renewable Future* 10 (Aug. 2021).
[120] *Id.* at 7; Int'l Renewable Energy Agency, *Green Hydrogen Cost Reduction: Scaling up Electrolysers to Meet the 1.5°C Climate Goal* 18 (Dec. 2020), https://irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Green_hydrogen_cost_2020.pdf; *see also* Int'l Energy Agency, *Decarbonising Industry with Green Hydrogen* (Nov. 17, 2020), https://www.iea.org/articles/decarbonising-industry-with-green-hydrogen (defining "'green' hydrogen" as hydrogen produced "using electricity generated from renewable energy sources").
[121] Int'l Renewable Energy Agency, *supra* note 120 at 18.
[122] David Iaconangelo, *U.S. to Miss DOE's Hydrogen Goals by Wide Margin – Report*, Energywire (June 28, 2023), https://subscriber.politicopro.com/article/eenews/2023/06/28/u-s-to-miss-does-hydrogen-goals-by-wide-margin-report-00103826.
[123] *See* NYSERDA & N.Y. State Dep't Env't Conservation, Integration Analysis Technical Supplement 52 (attached as Appendix G to Scoping Plan) (noting that hydrogen can play a critical role in decarbonizing sectors that are difficult to electrify).

Synthetic Natural Gas

SNG is also unlikely to achieve real climate benefits. As discussed, green hydrogen production is an energy-intensive process that is inherently less efficient than using electricity directly where feasible. Because green hydrogen is a component of SNG, SNG production is similarly a highly inefficient use of energy. Additionally, because CO_2 is also a component of SNG, if SNG were to become commercially viable, its production could incentivize GHG-intensive practices by creating or expanding a market for CO_2.

Certified Natural Gas

Under both the Deep Electrification and Hybrid pathways, certified gas becomes 100% of the fossil gas supply by 2033.[124] In the LTP, the Companies state that "[c]ertified gas reduces the upstream emissions factor associated with natural gas usage by 47%,"[125] but there is no guarantee that certified gas actually achieves meaningful GHG reductions. As discussed above, Con Edison is currently piloting a certified gas project precisely to "determine if the certified natural gas market has developed enough to provide meaningful and verifiable emission reductions upstream."[126] Additionally, no agreed-upon national standard for the certification process exists and the reliability of emissions reductions claims is uncertain.[127]

More importantly, certified natural gas is still fossil gas, and will only prolong reliance on the gas distribution system that needs to be downsized. Investments in certified natural gas would be better spent on alternatives that truly reduce GHGs and can decarbonize over the long term, such as electrification.

[124] Initial LTP at App. C-7.
[125] *Id.* at 67.
[126] Gas Infrastructure, Operations and Supply Panel Rebuttal Testimony, *supra* note 102, at 63-64.
[127] Strategen at 41.

C. The Combustion of Alternative Fuels Emits Co-Pollutants that Threaten Public Health and Exacerbate Environmental Disparities in Violation of the CLCPA.

The LTP must assess the health impacts of the decarbonization measures considered. Addressing health impacts associated with co-pollutants is a paramount objective of the CLCPA. For example, the statute requires the State to report on both GHG and co-pollutant emissions reductions, as well as "local benefits and impacts of any reductions in co-pollutants" related to GHG cuts[128] and directs State agencies to prioritize co-pollution reductions in disadvantaged communities.[129] The CLCPA instructed the Climate Action Council to consider the public health impacts of co-pollutants in developing the Scoping Plan.[130] Accordingly, the Scoping Plan specifically calls for additional analyses of the co-pollutant emissions and health impacts of alternative fuels such as RNG and green hydrogen prior to investments in such fuels for use in gas system planning, and recommends that before alternative fuels are used in the gas system, the State ensure that there are demonstrated health quality, health, and GHG benefits including avoided pollution in disadvantaged communities.[131]

The Companies cannot rely on alternative fuels without a full assessment of those fuels' co-pollutant and health impacts. Multiple tools exist to analyze these impacts: for example, as detailed in NYSERDA's comments on NFG's revised LTP, the Climate Action Council's Integration Analysis applies EPA's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool to conduct air quality analysis and evaluate public health outcomes associated with the Scoping Plan.[132]

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[128] ECL § 75-0119(2)(c), (g).
[129] CLCPA § 7(3).
[130] ECL § 75-0103(14)(b)(i).
[131] Scoping Plan at 351, 361.
[132] Comments of the New York State Energy Research and Development Authority (NYSERDA) at 2, NY PSC Case No. 22-G-0610 (June 15, 2023); *See also*, Scoping Plan App. G.

Indoor fuel combustion in New York poses grave health threats. In 2017, 1,940 premature deaths were caused by pollution from fuel combustion in buildings in New York, more than any other state.[133] This public health threat is even more acute in Con Ed's service territory; the vast majority of those deaths, 1,114, took place in New York City.[134] Because certified natural gas, SNG, and RNG are primarily methane, [135] their combustion will produce the same local pollutants as conventional fossil gas. These alternative fuels, when combusted, therefore produce: dangerous indoor levels of nitrogen oxides (NOx), which cause and exacerbate asthma and impair lung function; particulate matter, which can lead to premature death; carbon monoxide, which inhibits cellular respiration; and carcinogens including formaldehyde and benzene.[136] Nor will blending any of these fuels with hydrogen make them safe; hydrogen combustion produces up to six times as much NOx as methane combustion, and can therefore pose an even greater threat to human health.[137]

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[133] Talor Greunwald & Stephen Mushegan, *New York Emits More Building Air Pollution Than Any Other State*, Rocky Mountain Inst. (May 18, 2021), https://rmi.org/new-york-emits-more-building-air-pollution-than-any-other-state/.

[134] *Id*.

[135] Sasan Saadat et al., *Rhetoric vs. Reality*, *supra* note 108 at 16.

[136] *Id*.; Yannai S. Kashtan et al., *Gas and Propane Combustion from Stoves Emits Benzene and Increases Indoor Air Pollution*, 57 Env. Science & Tech. 9653 (2023), https://pubs.acs.org/doi/pdf/10.1021/acs.est.2c09289; Christopher W. Tessum et al., *$PM_{2.5}$ Polluters Disproportionately and Systematically Affect People of Color in the United States*, 7 Sci. Advances eabf4491, at 1–2 (2021), https://www.science.org/doi/pdf/10.1126/sciadv.abf4491. NOx is a pollutant that damages heart and respiratory function, impairs lung growth in children, and leads to higher rates of emergency room visits and premature death. Further, the State's Department of Health has identified the reduction of air pollution, including ozone, as a key indicator to drive improvements in asthma rates and public health outcomes throughout the state. The New York State Prevention Agenda 2019–2024 notes the "extensive evidence" linking ozone with respiratory and cardiovascular illness and death and establishes a goal to "reduce exposure to outdoor air pollutants," with an emphasis on vulnerable groups. *See* N.Y. State Dep't of Health, New York's State Health Improvement Plan: Prevention Agenda 2019-2024, at 72–73 (updated June 30, 2023), https://www.health.ny.gov/prevention/prevention_agenda/2019-2024/docs/ship/nys_pa.pdf; *see also Nitrogen Dioxide & Health*, Cal. Air Res. Bd., https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health (visited June 3, 2023).

[137] Mehmet Salih Cellek & Ali Pinarbasi, *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*, 43 Int'l J. Hydrogen Energy 1194, 1205 (2017), https://www.sciencedirect.com/science/article/abs/pii/S0360319917319791.

The local pollution generated from indoor fuel combustion poses a particular threat to communities of color, which are disproportionately impacted by deadly pollutants such as particulate matter.[138] A recent study by WE ACT for Environmental Justice found that low-income communities and communities of color that are already overburdened by air pollution and poor housing conditions are disproportionately impacted by negative health outcomes associated with gas stoves.[139] Low-income populations typically live in homes that are smaller, have inadequate mechanical ventilation, and contain aging stoves with less efficient combustion—all factors that result in higher indoor pollution levels.[140] Exposure to indoor air pollution is exacerbated for families that lack adequate heating and therefore use gas stoves for supplementing heating in the winter.[141] The health impacts disproportionately fall on families of color; in New York, nearly nineteen percent of childhood asthma cases can be attributed to a household's gas stove, and in New York City, Black and Latinx children and young adults comprise eighty percent of hospital visits for asthma.[142] Disadvantaged Communities, [143] which the State designated based on demographic information and existing environmental burdens, are therefore among the communities most exposed to indoor air pollution from fuel combustion.

The Companies' plan to rely on certified natural gas, RNG, hydrogen, and synthetic natural gas—which, at bottom, entails continuing to combust methane in homes—would exacerbate health harms, worsen environmental disparities, and run afoul of the CLCPA's requirement to reduce co-pollutants in disadvantaged communities.[144]

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[138] Christopher W. Tessum et al., *supra* note 136.
[139] WE ACT for Env't Justice, *Out of Gas, In With Justice* 2, 16 (Jan. 31, 2023), https://www.weact.org/wp-content/uploads/2023/02/Out-of-Gas-Report-FINAL.pdf.
[140] *Id*. at 16.
[141] *Id.*
[142] *Id*. at 2.
[143] *See Disadvantaged Communities Criteria, supra* note 2.
[144] CLCPA § 7(3).

D. Decarbonizing Through Alternative Fuels Will Lead to Ballooning Rates and Stranded Assets

The Scoping Plan confirms the need to downsize the gas distribution system in the coming years.[145] The Climate Action Council recommended utility-specific forecasts for reducing gas sales and decreasing the number of gas customers over time as well as applying greater scrutiny to investments in the gas distribution system to ensure that investments do not result in stranded assets and make it even more expensive to reduce GHG emissions in the future.[146] Attempting to decarbonize through alternative combustion fuels only serves to prop up an unsustainable gas distribution system and make it more difficult to achieve a managed downsizing.

A recent report by Groundwork Data found that replacing fossil gas with RNG across New York would cost ratepayers $25 billion annually, on top of the current expense of maintaining the gas pipeline system.[147] Even in a hybrid scenario that relies on a mix of electrification and pipelines, the high costs of alternative fuels will drive up customers' gas bills.[148] Moreover, in a hybrid scenario, per-customer costs will increase as fewer ratepayers shoulder the costs of maintaining the distribution system.[149] Because exiting the gas system requires upfront investments in energy efficiency and electrification measures, the system costs will increasingly fall to low-income ratepayers.[150] By contrast, a managed transition that moves away from pipeline gas in phases through targeted pruning—and frontloads investments in low-

[145] Scoping Plan at 350.
[146] *Id.* at 360, 362.
[147] BDC Report at 40.
[148] *Id.* at 46–48.
[149] *Id.*
[150] *Id.* at 26–27, 46–48.

to moderate-income households and disadvantaged communities—will avoid ballooning costs and minimize burdens to ratepayers.[151]

Groundwork Data's findings are supported by a report published this June by the American Council for an Energy-Efficient Economy ("ACEEE"), which studied the impacts of electrification and gas decarbonization on distribution costs nationwide.[152] ACEEE concluded that an unmanaged transition in which electrification occurs on a household-by-household basis is the costliest scenario, whereas strategic pipeline replacement would reduce costs to ratepayers.[153] Replacing a gas distribution line and helping customers electrify could save utilities up to $1,300 per customer, according to ACEEE.[154]

For these reasons, the Companies should reject the Hybrid pathway and adopt the Deep Electrification pathway, with modifications discussed in Strategen's comments and below.

V. THE LTP SHOULD ASSESS INDUSTRIAL DECARBONIZATION OPPORTUNITIES

The LTP should assess opportunities for industrial customers to decarbonize through energy efficiency and electrification. According to the initial LTP, industrial customers represent 19% of O&R's gas usage.[155] However, O&R's volume forecast does not break out specific industries and O&R has no stated plan for achieving industrial decarbonization.[156] As ACEEE has detailed in a new *State Industrial Decarbonization Policy Handbook for Utilities*, utilities have a role to play in supporting decarbonization of the industrial sector, including through policy input, utility-sponsored programs, and incentives.[157]

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[151] *Id*. at 53–54.
[152] *See* Stephen Nadel, ACEEE, *Impact of Electrification and Decarbonization on Gas Distribution Costs* (June 2023), https://www.aceee.org/sites/default/files/pdfs/U2302.pdf.
[153] *Id*. at iv, 17, 27.
[154] *Id*. at 17–18.
[155] Initial LTP at 26.
[156] SC and EJ 1-3 (Attached as Exhibit C).
[157] Pavitra Srinivasan et al., ACEEE, *State Industrial Decarbonization Policy Handbook for Utilities* (June 2023).

The industrial sector has several options for decarbonization, including electrification and energy efficiency measures.[158] Although heat pumps are often discussed primarily as solutions in the residential and commercial sectors, industrial heat pumps can also provide process heat for low-temperature industrial needs. In fact, Southern California's air regulator recently adopted a zero-emissions standard for commercial ovens.[159]

A growing body of research demonstrates that heat pumps and electrification of process heat present significant opportunities to decarbonize industrial uses.[160] According to the U.S. Department of Energy, decarbonization efforts in the industrial sector include electrification of process heat using advanced heat pumps and electrification of high-temperature range processes such as those found in iron, steel, and cement making.[161] A recent research report by ACEEE noted that several commercially available heat pumps can reach temperatures of 160 degrees Celsius (320 degrees Fahrenheit), a range that would cover 44% of existing heat needs.[162] These industrial heat pumps can save up to 32% of the source energy for process heat, and can have extremely short paybacks (2–3 years) in situations where electricity has a cost advantage over natural gas.[163]

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[158] *See, e.g.*, *id*. at 16, 19; Iwona Cameron et al., Ricardo Energy & Env't, *Decarbonisation Road Map for the European Food and Drink Manufacturing Sector* (Jul. 2021), https://www.fooddrinkeurope.eu/wp-content/uploads/2021/09/Decarbonising-the-European-food-and-drink-manufacturing-sector_v2.pdf; U.S. Dep't of Energy, Industrial Decarbonization Roadmap Fact Sheet (2022), https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap%20Fact%20Sheet.pdf; M. Jibran S. Zuberi et al., *Bottom-Up Assessment of Industrial Heat Pump Applications in U.S. Food Manufacturing,* 272 Energy Conversion & Mgmt. 116349 (2022).

[159] *See* S. Coast Air Quality Mgmt. Dist., Proposed Amended Rule 1153.1, Emissions of Oxides of Nitrogen from Commercial Food Ovens (June 30, 2023).

[160] *See, e.g.*, U.S. Dep't of Energy, Industrial Decarbonization Roadmap Fact Sheet (2022), https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap%20Fact%20Sheet.pdf; M. Jibran S. Zuberi et al., *Bottom-Up Assessment of Industrial Heat Pump Applications in U.S. Food Manufacturing,* 272 Energy Conversion & Mgmt., 116349 (2022).

[161] U.S. Dep't of Energy, Industrial Decarbonization Roadmap Fact Sheet at 3.

[162] Ed Rightor et al., ACEEE, *Industrial Heat Pumps: Electrifying Industry's Process Heat Supply*, at vii, 2 (Mar. 2022), https://www.aceee.org/sites/default/files/pdfs/ie2201.pdf.

[163] *Id.* at vii.

To better understand the limitations and potential options or opportunities to electrify the industrial sector within its service territory, O&R should separate its industrial customers into subsectors such as (1) food manufacturing including dairy and meat processing; (2) automotive; (3) chemical; (4) power generation; (5) textile; (6) pulp and paper; (7) cement; (8) asphalt; (9) stone; (10) wood processing; and (11) steel: primary or secondary. Identifying the industrial customers by subsector will allow O&R and stakeholders to determine viable and cost-effective options to electrify and reduce their GHG emissions. Industrial heat for manufacturing processes is a significant source of emissions, and because of the heterogeneity of the manufacturing sector and the variety of different production methods on a process level, it is important for O&R to assess, develop, and identify the optimal industrial decarbonization pathways for its customers.

The revised LTP should identify which subsector of O&R's industrial customers would be best suited for industrial heat pumps, identify specific barriers associated with side-scale applications of industrial heat pumps, and then provide a plan for how O&R will address these challenges and identify the targeted actions needed, including further research, development, demonstration and deployment.

VI. TO MEANINGFULLY REDUCE GHG EMISSIONS WHILE MINIMIZING CUSTOMER BILL IMPACTS, THE COMPANIES MUST SCALE UP THE NPA PROGRAM AND SIGNIFICANTLY MODIFY THE MAIN REPLACEMENT PROGRAM

To meet New York State's ambitious CLCPA mandates and meaningfully reduce GHG emissions, the Companies must reject the Hybrid pathway and proceed with the Deep Electrification pathway with some modifications. Both the Hybrid and Deep Electrification pathways incorporate a shift in the use of the Companies' existing natural gas distribution systems in favor of utilizing NPAs; however, the Hybrid pathway relies on maintaining more

traditional fossil fuel infrastructure.[164] The Companies acknowledge that as more customers electrify and transition off the gas system, costs for the remaining gas customers will rapidly increase, yet neither pathway explains how they intend to manage those costs.[165] The Companies should update the Deep Electrification pathway by aggressively scaling up their NPA program and deferring the Main Replacement Program ("MRP") and other capital-intensive investments in the gas system in favor of more active leak detection, methane capture, and selective repair of the most consequential leaks in order to minimize the costs to the remaining gas customers.

As the Companies recognize, the Commission directed all utilities to identify the locations of specific segments of the MRP that "could be abandoned in favor of NPAs and where infrastructure projects may be needed in the near future to maintain reliability."[166] The Commission encouraged utilities to take a "neighborhood approach" and develop "a comprehensive and strategic plan that simultaneously removes leaking or leak-prone infrastructure and employs programs such as weatherization and demand response along with electrification."[167] The Climate Action Council, Staff, and the Commission have all emphasized the importance of identifying strategic opportunities to retire existing pipelines as demand declines, when repairing and replacing the MRP program.[168] The Companies also filed proposed NPA frameworks in August 2022 in the Gas Planning Proceeding, which included proposed suitability criteria, cost recovery mechanisms, and incentives. The Companies anticipate that adoption of these frameworks will facilitate the development and implementation of NPAs in their service territories. Con Edison "has already taken steps to integrate NPAs into its utility

[164] Initial LTP at 64–65.
[165] *Id.* at 6.
[166] Gas Planning Order at 39.
[167] *Id*.
[168] Scoping Plan at 358; Gas Planning Order at 39.

planning process" and its rate cases and O&R "has begun the process of integrating NPAs into its planning process."[169]

Commenters commend the Companies' intention to transition customers away from fossil fuel use by (1) advocating for the elimination of subsidies for new mains or services associated with new gas connections and (2) pursuing NPAs that mitigate the need for gas infrastructure investments.[170] However, despite the planning and progress the Companies have had with their NPAs, the Companies' capital forecasts do not reflect significant use of NPAs.[171] The Companies still anticipate spending several billion dollars in distribution pipeline replacement and upgrades and nearly a billion dollars in transmission projects through 2030.[172] The Companies assume that, for their Deep Electrification pathway, "main replacement programs end by 2031 (Con Edison and O&R); routine CapEx in rate case through 2024 (O&R) and 2025 (Con Edison) then proportional to main mileage."[173] Even more, Con Edison forecasts $2.28 billion in leak-prone pipe replacements and nearly a quarter of a billion dollars in system reinforcement spending through 2030 in the Deep Electrification pathway.[174] O&R forecasts over a quarter of billion dollars in main replacements and reliability investments through 2030 in the Deep Electrification pathway, or 75% of its capital budget over that span.[175] Over that same period, O&R forecasts $10 million towards NPAs, only 3% of its capital spending. From 2031–2042, NPA spending accounts for 2% of O&R's capital spending, despite a considerable decrease in

[169] Initial LTP at 30.
[170] *Id.* at 5.
[171] Strategen at 25.
[172] DPS 1-26 Att. 1 (attached as Exhibit D)
[173] Initial LTP at 72 fig. 49.
[174] Strategen at 25.
[175] *Id.*

overall spending.[176] The Companies' capital forecasts in each pathway reflect considerable pipeline investments and negligible commitments to NPAs.[177]

The high costs of gas system replacements must be managed and strategically reduced where possible. The Companies are in a unique position compared to their sister utilities in the state because they serve customers in urban, suburban, and rural neighborhoods. Gas distribution maintenance and capital costs can vary based on the density of housing, and other buildings.[178] In urban areas, such as New York City, many homes and buildings are served per mile of pipes while rural areas, such as communities in O&R's service territory, have much longer pipe runs between buildings.[179] When evaluating potential Main Replacement Projects that could be replaced with an a NPA, the Companies should be considering population density along with the number of remaining customers on the gas system. In a 2023 Groundwork Data report on New York State, Michael Walsh and Michael Bloomberg identified capital costs and miles of new and replacement pipe by utility, over the past decade.[180] Costs varied, but the average cost per mile in a rural community was $849,000; in the suburbs, the average cost per mile was $1.85 million; and in an urban community, the average cost per mile was $5.5 million.[181] Even more, in rural areas there are 2.5 times more feet of pipe per customer than in suburban areas. And in urban areas, there are half the feet of pipe per customer than in suburban areas.[182] Given this information, when the Companies consider NPA projects and conduct a benefit-cost analysis, their modeling must be transparent in how they evaluate and compare: (1) the price to repair or replace per foot or mile of pipe; (2) how many customers are served per foot or mile of pipe; (3)

[176] *Id.* at 25–26.
[177] *Id*. at 26.
[178] ACEEE, *Impacts of Electrification and Decarbonization on Gas Distribution Costs*, at 18.
[179] *Id.*
[180] BDC Report at 15, tbl. 1.
[181] ACEEE, *Impacts of Electrification and Decarbonization on Gas Distribution Costs*, at 18–19.
[182] *Id.* at 19.

the upfront costs to electrify; (4) the decrease in gas demand; and (5) the avoided long-term costs to maintain the distribution line. In its revised LTP, the Companies must explain and model how the Deep Electrification pathway will achieve a rapid transition to electrification using NPAs while meeting the energy needs of its customers and preventing ballooning bills for ratepayers.

Pipe replacement costs could be reduced or deferred by strategically targeting certain neighborhoods for electrification. Ramping up NPAs would allow the decommissioning of specific gas lines and could mitigate the cost increases for the remaining gas customers. The Companies' strategic long-term planning should begin now, before the impacts of cost growth balloon, and should include innovative financial structures, community or neighborhood targeting, and region-specific decarbonization solutions.

VII. THE LTP FAILS TO SUFFICIENTLY ASSESS IMPACTS ON AND DIRECT INVESTMENTS TO DISADVANTAGED COMMUNITIES

The Companies fail to discuss how the pathways considered in the LTP will impact disadvantaged communities and fail to funnel at least 35% of the benefits of energy efficiency and clean energy funding to disadvantaged communities as required by the Gas Planning Order[183] and the CLCPA.[184] The Gas Planning Order directs utilities to identify disadvantaged communities in their service territories, assess the impacts on those communities of any proposed projects, and explain how the utilities will ensure that an appropriate portion of the benefits of any NPA will accrue to those communities.[185] While the Companies' LTP identifies disadvantaged communities in each service territory, it fails to address the impacts the Company's proposed projects will have on those communities or how benefits will flow to them.

[183] Gas Planning Order at 39–40.
[184] ECL § 75-0117.
[185] Gas Planning Order at 39–40.

The Gas Planning Order requires utilities to "explain the impacts to disadvantaged communities of any proposed projects."[186] The Companies fail to fulfill this mandate. The Disadvantaged Communities sections of the LTP briefly note the challenges disadvantaged communities face;[187] however, neither Company assesses the impacts on disadvantaged communities of the pathways described in the LTP.[188]

The LTP discusses several decarbonization options, including electrification and low-carbon fuels, but the Companies do not mention how any proposed measures will affect disadvantaged communities. The LTP in general, and the Hybrid pathway in particular, would disproportionately burden disadvantaged communities through the combustion of alternative fuels. Indoor fossil fuel combustion disproportionately impacts low-income communities and communities of color.[189] As discussed above, the combustion of RNG, hydrogen, SNG, and certified natural gas pose the same or worse health threats as fossil gas combustion. Because disadvantaged communities are by definition already overburdened by pollution and negative health outcomes, reliance on alternative combustion fuels will disproportionately burden disadvantaged communities by prolonging a system that harms their health. Our energy system cannot continue to place disproportionate burdens on disadvantaged communities; a new paradigm is needed and can be provided by electrification.

The Hybrid and Deep Electrification pathways both involve transitioning customers away from gas, to differing extents.[190] The revised LTP must assess the impact of this shift on disadvantaged communities. If Companies do not strategically manage the transition away from

[186] *Id.* at 40.
[187] Initial LTP at 19.
[188] *See id.* at 16–19, 26–27.
[189] WE ACT for Env't Justice, *supra* note 139, at 2, 16.
[190] Initial LTP at 4.

pipeline gas, fixed costs would remain relatively stagnant while fewer customers remain to pay those costs. As PA Consulting notes, under the Gas Planning Order the Companies must provide the calculated bill impacts of their plans.[191] Because exiting the gas system requires upfront investments in electrification and efficiency, in an unmanaged transition low-income households will be the last to remain in the system and shoulder the ballooning system maintenance costs, which could result in disproportionate burdens on disadvantaged communities.[192]

Further, in laying out multiple pathways instead of one,[193] the Companies obfuscate their actions' potential effects on disadvantaged communities. In the LTP, the Companies set forth pathways "that represent potential end states."[194] The Companies explicitly state that they "are not expressing a preference for either the Hybrid or Deep Electrification pathway."[195] A stated goal of the Gas Planning Order is to ensure stakeholders can engage in the future of New York's natural gas infrastructure.[196] To achieve this goal, the Gas Planning Order requires utilities to detail their plans and how those plans will affect disadvantaged communities.[197] The Companies have neither committed to a plan nor explained such a plan's impacts on disadvantaged communities, making it impossible for stakeholders to assess the LTP's compliance with CLCPA Section 7(3) and running afoul of the Gas Planning Order. The Companies' revised LTP must address how the Companies' proposed projects will impact disadvantaged communities.

Additionally, the CLCPA directs state agencies—and the Gas Planning Order directs utilities—to ensure that at least 35% of the overall benefits of spending on clean energy and

[191] PA Initial Report at 40; Gas Planning Order at 45.
[192] BDC Report at 44–45.
[193] Initial LTP at 4.
[194] *Id.* at 3.
[195] *Id.* at 4.
[196] Gas Planning Order at 1–2.
[197] *Id.* at 40.

energy efficiency programs flow to disadvantaged communities.[198] The LTP falls far short of this mandate.

The Companies mention an internal Environmental Justice Working Group and Executive Steering Committee and list policy commitments to disadvantaged communities.[199] However, the Companies provide no information on how they will deliver on these commitments. Appendix A, the Companies' single-page "Environmental Justice Policy Statement," also provides no information on the LTP's benefits to disadvantaged communities. Instead, Appendix A states the Companies will "[b]enchmark with [environmental justice] best practices to evaluate opportunities to enhance community engagement strategies" and consider how GIS mapping can bring consistency to planning "[i]n the coming years."[200] The Gas Planning Order requires utilities to use their LTPs to explain how an appropriate portion of benefits from NPAs will flow to disadvantaged communities.[201] Instead, the Companies have used their LTP to explain how they might work towards achieving this requirement, due now, "[i]n the coming years."[202]

In the Disadvantaged Communities sections of the LTP, the Companies note that some customers receive discounts from the Companies' Energy Affordability Programs.[203] However, the CLCPA requires the utilities to direct benefits to disadvantaged communities from "clean energy and energy efficiency programs," and the Companies cannot point to existing energy affordability programs to fulfill this mandate.[204] While the affordability programs provide consumers with discounted energy bills, they do not incentivize cleaner or more efficient energy

[198] ECL § 75-0117; Gas Planning Order at 40.
[199] Initial LTP at 19.
[200] *Id.* at App. A-1.
[201] Gas Planning Order at 40.
[202] Initial LTP at App. A-1.
[203] *Id*. at 19, 27.
[204] ECL § 75-0117.

usage, and therefore do not bring the Companies closer to achieving the CLCPA's requirement of ensuring at least 35% of clean energy and energy efficiency investments accrue to disadvantaged communities. PA Consulting agrees with the above assessment, noting that the "Companies did not provide insight on how the [LTP] ensures at least 35% of benefits are directed to disadvantaged communities."[205]

The Companies can direct investments in clean energy or energy efficiency programs to disadvantaged communities in several ways. Since the Companies provide electric and gas services to their customers, assisting gas customers with electrification should be one way to invest in disadvantaged communities. Additionally, the Companies should prioritize disadvantaged communities in weatherization and energy efficiency efforts.

The Companies should also assess potential opportunities to direct benefits from public funding to disadvantaged communities in their service territories. For example, in December 2022, Governor Hochul awarded $52 million to create Regional Clean Energy Hubs throughout the state to help New Yorkers in underserved and disadvantaged communities enroll in energy efficiency and clean energy programs.[206] The Association for Energy Affordability, Inc. received $8.9 million, Neighborhood Housing Services of Queens received $6.6 million, and WE ACT for Environmental Justice received $3.8 million to establish Regional Clean Energy Hubs in the Companies' service territories.[207] The Companies should work with these organizations to enroll more customers in energy efficiency and clean energy programs, targeting members of disadvantaged communities. The Companies' revised LTP must include a complete discussion of

[205] PA Initial Report at 10, 12, 41, 44.
[206] NYSERDA, Press Release, Governor Hochul Announces $52 Million in Awards for Regional Clean Energy Hubs to Connect New York Communities with Clean Energy Resources (Dec. 9, 2022), https://www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-12-09-Governor-Hochul-Announces-$52-Million-for-Clean-Energy-Hubs.
[207] *Id.*

the Companies' plan to ensure an appropriate amount of benefits from clean energy or energy efficiency programs will flow to disadvantaged communities.

Finally, Con Ed states it will file a "Disadvantaged Communities Report" as required by a recently approved Joint Proposal in Con Ed's 2023 rate case.[208] According to Con Ed, the Report will provide data on Con Ed's "investments, engagement and workforce development efforts in" disadvantaged communities.[209] Con Ed claims the Report will go "far beyond current legal requirements."[210] Whether this Report will bring Con Ed any closer to explaining the burdens or benefits of Con Ed's proposed projects on disadvantaged communities is unclear, since Con Ed has yet to share any of the data. What is clear, however, is that providing data in the future cannot substitute for Con Ed's present duty to explain the burdens and benefits of its proposed projects on disadvantaged communities.

The final disadvantaged community criteria do not differ significantly from the draft criteria issued in December 2021, and even earlier, the State had provided interim criteria that could be used for CLCPA compliance. The Companies have had nearly two years to identify disadvantaged communities in their services territories and develop a plan to address burdens and direct benefits. They have fallen far short of these requirements in the initial LTP. The revised LTP must include a discussion of the impacts on disadvantaged communities and how the Companies plan to ensure that disadvantaged communities receive at least 35% of the benefits of energy efficiency and clean energy investments.

[208] Order Adopting Joint Proposal at 139–140.
[209] Initial LTP at 19.
[210] Order Adopting Joint Proposal at 140.

VIII. CONCLUSION

As set forth above, Sierra Club and Earthjustice have serious concerns about the LTP, which fails to identify what pathway the Companies will be pursuing. In revising the LTP, the Companies must correct inaccurate assumptions and address the deficiencies discussed above. The Companies should adopt the Deep Electrification pathway with the modifications discussed above and in Strategen's accompanying comments, and reject the Hybrid pathway.

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Exhibit A

Company Name: Con Edison and O and R Utilities
Case Description: PSC Statewide Gas Planning Proceeding
Case: 23-G-0147

Response to DPS Interrogatories – Set DPS-3
Date of Response: June 23, 2023
Responding Witness: N/A

Question No. :77
Please provide the buildup of the data comprising the annual charges for representative gas customers in Figure 6, for both the nominator (Gas system and fuel supply) and the values in the denominator (assumed volumes) for all projected years between 2023 and 2050 in excel format. Please provide the buildup of the Gas system and fuel supply cost by all components (e.g, fuel cost, various investments driving the CapEx)

Response

Please see attachment DPS-3-77 Att. 1.

INVESTMENTS ($M)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Reference	1,109	1,157	1,138	1,162	1,180	1,123	1,108	1,090	1,022	1,012	1,005	1,003	981	946	925	904	892	647	312	309	309	309	309	308	308	308	308	217
Hybrid	1,109	1,157	1,138	1,030	1,026	967	786	786	751	737	728	720	700	602	597	592	579	565	345	342	340	337	334	331	329	326	324	321
Deep Electrification	1,109	1,164	1,121	918	905	836	475	465	443	308	299	292	252	144	137	129	121	114	106	98	91	83	75	68	60	52	44	37
DEEP Dep.	1,109	1,164	1,121	918	905	836	475	465	443	308	299	292	252	144	137	129	121	114	106	98	91	83	75	68	60	52	44	37

RATE BASE ($M)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Reference	10,087	10,801	11,471	12,136	12,785	13,344	13,854	14,314	14,674	14,996	15,285	15,547	15,762	15,918	16,029	16,094	16,123	15,884	15,296	14,702	14,107	13,517	12,931	12,347	11,766	11,187	10,609	9,943
Hybrid	10,087	10,801	11,471	12,004	12,506	12,920	13,127	13,403	13,623	13,807	13,967	14,102	14,201	14,186	14,153	14,100	14,019	13,909	13,565	13,212	12,853	12,495	12,136	11,776	11,413	11,047	10,678	10,304
Deep Electrification	10,087	10,808	11,460	11,882	12,267	12,560	12,470	12,521	12,538	12,411	12,275	12,129	11,941	11,643	11,338	11,023	10,699	10,364	10,020	9,665	9,305	8,947	8,589	8,232	7,874	7,515	7,154	6,789
DEEP Dep.	10,025	10,620	11,085	11,269	11,365	11,321	10,868	10,527	10,129	9,568	8,981	8,367	7,696	6,908	6,103	5,282	4,444	3,590	2,718	1,831	934	33	(871)	(1,779)	(2,692)	(3,608)	(4,529)	(5,456)

GAS VOLUME (thousands of DT)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Reference	220,389	222,522	221,151	218,655	214,695	213,015	211,312	209,238	207,619	205,241	202,360	199,357	196,336	193,206	189,818	186,452	182,990	179,494	176,240	172,929	169,804	166,477	163,149	160,821	158,494	157,166	154,839	152,511
Hybrid	220,389	220,549	218,996	217,048	214,590	211,391	206,126	200,083	196,221	191,843	186,945	181,486	174,271	167,031	159,675	152,479	145,544	138,690	133,524	129,015	124,318	120,034	116,218	113,110	110,288	107,837	105,599	103,289
Deep Electrification	220,389	216,587	210,317	202,773	194,048	184,038	171,664	158,419	150,929	142,977	134,542	125,606	115,143	104,633	94,040	83,611	73,429	63,321	54,273	49,492	41,443	34,381	28,062	21,893	16,539	12,289	8,536	6,384
DEEP Dep.	220,389	216,587	210,317	202,773	194,048	184,038	171,664	158,419	150,929	142,977	134,542	125,606	115,143	104,633	94,040	83,611	73,429	63,321	54,273	49,492	41,443	34,381	28,062	21,893	16,539	12,289	8,536	6,384

Customer Count	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Reference	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	998,215	984,178	970,098	955,680	941,291	927,188	912,851	898,526
Hybrid	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	987,585	970,111	952,637	935,163	917,689	900,215	882,740	865,266	847,792	830,318
Deep Electrification	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	970,834	914,224	857,613	801,003	744,393	687,782	631,172	574,562	517,951	461,341	404,731	348,120	291,510	234,900	178,289	121,679	65,069	40
DEEP Dep.	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	970,834	914,224	857,613	801,003	744,393	687,782	631,172	574,562	517,951	461,341	404,731	348,120	291,510	234,900	178,289	121,679	65,069	40

INVESTMENTS ($M)

UTILITY	Pathway	TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CECONY	REFERENCE	CAPITAL	$988	$1,030	$1,007	$1,040	$1,071	$1,022	$1,015	$1,003	$982	$973	$966	$964	$956	$926	$905	$884	$873	$628	$293	$291	$291	$291	$291	$291	$291	$291	$291	$201
CECONY	REFERENCE	REG ASSET	$59	$64	$65	$56	$43	$35	$27	$21	$18	$18	$18	$18	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ORU	REFERENCE	CAPITAL	$63	$63	$63	$63	$63	$63	$62	$62	$22	$21	$21	$21	$20	$20	$20	$19	$19	$19	$18	$18	$18	$17	$17	$17	$17	$16	$16	$16
ORU	REFERENCE	REG ASSET	$0	$0	$3	$3	$3	$3	$3	$3	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0
CECONY	HYBRID	CAPITAL	$988	$1,030	$1,007	$906	$915	$865	$691	$698	$710	$696	$688	$681	$675	$581	$577	$572	$560	$546	$327	$325	$322	$320	$318	$316	$314	$312	$310	$308
CECONY	HYBRID	REG ASSET	$59	$64	$65	$56	$43	$35	$27	$21	$18	$18	$18	$18	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ORU	HYBRID	CAPITAL	$63	$63	$63	$65	$65	$65	$64	$64	$23	$23	$22	$22	$21	$20	$20	$19	$19	$18	$18	$17	$17	$16	$16	$15	$15	$14	$14	$13
ORU	HYBRID	REG ASSET	$0	$0	$3	$3	$3	$3	$3	$3	$1	$1	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CECONY	DEEP	CAPITAL	$988	$1,030	$1,007	$816	$822	$788	$436	$431	$426	$292	$285	$278	$240	$136	$129	$122	$114	$107	$100	$93	$86	$78	$71	$64	$57	$49	$42	$35
CECONY	DEEP	REG ASSET	$59	$71	$66	$53	$34	$23	$14	$9	$6	$5	$4	$4	$3	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ORU	DEEP	CAPITAL	$63	$63	$46	$47	$47	$24	$24	$23	$10	$10	$10	$9	$9	$8	$8	$7	$7	$7	$6	$5	$5	$4	$4	$4	$3	$3	$2	$2
ORU	DEEP	REG ASSET	$0	$0	$2	$2	$2	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CECONY	DEEP w/ Depreciation	CAPITAL	$988	$1,030	$1,007	$816	$822	$788	$436	$431	$426	$292	$285	$278	$240	$136	$129	$122	$114	$107	$100	$93	$86	$78	$71	$64	$57	$49	$42	$35
CECONY	DEEP w/ Depreciation	REG ASSET	$59	$71	$66	$53	$34	$23	$14	$9	$6	$5	$4	$4	$3	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ORU	DEEP w/ Depreciation	CAPITAL	$63	$63	$46	$47	$47	$24	$24	$23	$10	$10	$10	$9	$9	$8	$8	$7	$7	$7	$6	$5	$5	$4	$4	$4	$3	$3	$2	$2
ORU	DEEP w/ Depreciation	REG ASSET	$0	$0	$2	$2	$2	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

O&M ($M)

UTILITY	Pathway	TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CECONY	REFERENCE	O&M	174.0	182.7	190.1	193.9	197.7	193.9	193.8	193.7	193.6	193.6	193.6	193.6	193.6	193.7	193.8	193.9	194.0	189.6	189.8	189.9	189.9	189.9	189.9	189.9	189.9	189.9	189.9	189.9
ORU	REFERENCE	O&M	25.9	26.1	26.1	26.0	25.9	25.8	25.6	25.4	25.2	24.9	24.7	24.5	24.2	23.9	23.6	23.4	23.1	22.8	22.6	22.3	22.1	21.9	21.7	21.5	21.3	21.0	20.8	20.6
CECONY	HYBRID	O&M	174.0	182.7	190.1	191.4	193.8	191.6	190.2	186.1	181.8	177.5	173.2	169.0	164.7	160.6	156.4	152.2	148.1	179.2	172.2	167.1	161.9	156.8	151.7	146.5	141.4	136.3	131.2	126.1
ORU	HYBRID	O&M	25.9	26.1	26.1	26.0	25.9	25.8	25.6	25.2	24.8	24.4	24.0	23.6	23.1	22.7	22.3	21.9	21.5	21.1	20.7	20.3	19.9	19.5	19.0	18.6	18.2	17.8	17.4	17.0
CECONY	DEEP	O&M	174.0	182.7	190.1	191.5	193.8	191.6	189.1	181.4	173.7	164.9	157.2	149.5	136.4	128.7	121.0	113.3	105.6	92.0	82.4	74.7	67.0	59.3	51.6	43.9	36.2	28.5	20.8	13.5
ORU	DEEP	O&M	25.9	26.1	26.1	26.0	25.9	25.8	25.6	24.8	24.0	23.2	22.4	21.6	20.8	20.1	19.3	18.5	17.7	16.9	16.1	15.3	14.5	13.7	12.0	11.4	10.9	10.9	10.9	8.5
CECONY	DEEP w/ Depreciation	O&M	174.0	182.7	190.1	191.5	193.8	191.6	189.1	181.4	173.7	164.9	157.2	149.5	136.4	128.7	121.0	113.3	105.6	92.0	82.4	74.7	67.0	59.3	51.6	43.9	36.2	28.5	20.8	13.5
ORU	DEEP w/ Depreciation	O&M	25.9	26.1	26.1	26.0	25.9	25.8	25.6	24.8	24.0	23.2	22.4	21.6	20.8	20.1	19.3	18.5	17.7	16.9	16.1	15.3	14.5	13.7	12.0	11.4	10.9	10.9	10.9	8.5

ABANDONMENT & REMOVAL COSTS ($M)

UTILITY	Pathway	TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CECONY	REFERENCE		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ORU	REFERENCE		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CECONY	HYBRID		-	-	-	-	-	-	-	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9
ORU	HYBRID		-	-	-	-	-	-	-	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
CECONY	DEEP		-	-	-	-	-	-	-	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3
ORU	DEEP		-	-	-	-	-	-	-	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5
CECONY	DEEP w/ Depreciation		-	-	-	-	-	-	-	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3	122.3
ORU	DEEP w/ Depreciation		-	-	-	-	-	-	-	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5

SUPPLY COST ($/MMBTU)

UTILITY	Pathway	TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
CECONY	REFERENCE		4.74	4.90	4.94	5.12	5.26	5.46	5.55	5.58	5.60	5.60	5.62	5.60	5.66	5.75	5.81	6.01	6.06	6.26	6.30	6.36	6.60	6.81	7.00	7.06	7.21	7.26	7.41	7.51
ORU	REFERENCE		4.74	4.90	4.94	5.12	5.26	5.46	5.55	5.58	5.60	5.60	5.62	5.60	5.66	5.75	5.81	6.01	6.06	6.26	6.30	6.36	6.60	6.81	7.00	7.06	7.21	7.26	7.41	7.51
CECONY	HYBRID		4.74	4.90	4.96	5.15	5.30	5.51	5.61	5.97	6.45	6.79	7.15	7.50	7.95	8.47	9.00	9.56	10.16	11.07	11.28	11.48	11.81	12.10	13.46	14.76	16.13	17.49	18.89	20.33
ORU	HYBRID		4.74	4.90	4.96	5.15	5.30	5.51	5.61	5.93	6.40	6.72	7.06	7.39	7.81	8.29	8.76	9.26	9.77	10.58	10.76	10.95	11.25	11.51	12.96	14.38	15.89	17.40	18.93	20.51
CECONY	DEEP		4.74	4.90	4.96	5.15	5.30	5.66	5.76	5.83	5.91	5.98	6.05	6.10	6.23	6.42	6.59	6.79	7.02	7.45	7.70	7.87	8.37	8.90	9.54	10.31	11.52	13.17	16.22	19.26
ORU	DEEP		4.74	4.90	4.96	5.15	5.30	5.66	5.76	6.47	6.59	6.71	6.84	6.96	7.17	7.44	7.70	7.98	8.30	8.79	9.06	9.36	9.95	10.58	11.35	12.21	13.38	14.75	16.51	19.26
CECONY	DEEP w/ Depreciation		4.74	4.90	4.96	5.15	5.30	5.66	5.76	5.83	5.91	5.98	6.05	6.10	6.23	6.42	6.59	6.79	7.02	7.45	7.70	7.87	8.37	8.90	9.54	10.31	11.52	13.17	16.22	19.26
ORU	DEEP w/ Depreciation		4.74	4.90	4.96	5.15	5.30	5.66	5.76	6.47	6.59	6.71	6.84	6.96	7.17	7.44	7.70	7.98	8.30	8.79	9.06	9.36	9.95	10.58	11.35	12.21	13.38	14.75	16.51	19.26

Exhibit B

Company Name: Con Edison and O and R Utilities
Case Description: PSC Statewide Gas Planning Proceeding
Case: 23-G-0147

Response to Sierra Club/Earth Justice Interrogatories – Set SC and EJ-2
Date of Response: July 11, 2023
Responding Witness: N/A

Question No. :11
In reference to page 50 of the LTP, which states, "We assume that Con Edison and O&R use their representative share of RNG produced by anaerobic digestion from the MidAtlantic and the rest of the Eastern U.S., in addition to the full amount produced by anaerobic digestion in our service territories, which is 44 TBTU total in an 'achievable deployment' pathway where only 33% of total RNG feedstock is captured (ICF RNG Technical Potential Study)":
a. Please provide all supporting analysis used to determine ConEd's "representative share" of RNG.
b. Please provide the total amount of achievable RNG in the area (referenced as "Mid-Atlantic and the rest of the Eastern U.S.") from which ConEd seeks to source RNG. Please exclude the 44 TBTU in ConEd's service territory.
c. Please provide the representative share of RNG that ConEd seeks to acquire in each year of the LTP.
d. What industries and sectors are factored in the "representative share"?

Response
See "SC and EJ-2-11-Att. 1". Please note that the 44 TBTU of RNG referred to all RNG assumed to be available to CEI from anaerobic digestion facilities within our service territories and throughout the Eastern U.S.

Note: our representative share of RNG consumption from outside of our service territories is based on our 2020 share of gas consumption

Source	Region	2020 Gas Consumption	% of Eastern U.S.	% of Mid-Atlantic	% of NYS	% of Hudson Valley
NYC Carbon Neutral Study	Eastern U.S.	5,964	100%			
NYC Carbon Neutral Study	Mid-Atlantic	1,789	30%	100%		
Patterns and Trends - New York State Energy Profile - NYSERDA	NYS	937	16%	52%	100%	
NYSERDA IA	Lower Hudson Valley	108	2%	6%	12%	
NYC GHG Inventory	NYC (CECONY + NGRID)	340	5.7%	19%	36%	
Energy Management	NYC - CECONY	142	2%	8%	15%	
Energy Management	Westchester	38	1%	2%	4%	35%
Energy Management	CECONY Total	179	3%	10%	19%	
10-K	ORU	26	0.43%	1%	3%	24%

Calculating our share of RNG from outside our service territories (TBTU):

							v scenario from Carbon Neutral NYC		subtracts out amount produced within our service territories	
Notes	Source	Region	Production Type	Feedstock	Technical Potential (max potential)	Acheivable Potential	NYC Share of Acheivable Potential, mid scenario (excludes TG)	NYC + Westchester Share of Achievable Potential	CECONY Share of Achievable Potential (removed Nat Grid)	ORU Share of Achievable Potential
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Anaerobic Digestion	Animal Manure	997.6	177.2	10.1	11.2	5.9	0.8
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Anaerobic Digestion	Food Waste	222.5	29.8	1.7	1.9	1.0	0.1
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Anaerobic Digestion	Landfill Gas	730.7	398.2	22.7	25.2	13.3	1.7
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	53.5	14.0	0.8	0.9	0.5	0.1
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Thermal Gasification	Agricultural Residue	797.7	173.7	0.0	0.0	0.0	0.0
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Thermal Gasification	Energy Crops	1777.7	229.8	0.0	0.0	0.0	0.0
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Thermal Gasification	Forestry and Forest Product Residue	391.7	140.4	0.0	0.0	0.0	0.0
achievable potential excludes Mid-Atlantic	ICF	Eastern U.S.	Thermal Gasification	Municipal Solid Waste	1078.3	308.8	0.0	0.0	0.0	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Anaerobic Digestion	Animal Manure	99.3	24.7	4.7	5.2	2.7	0.3
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Anaerobic Digestion	Food Waste	50.1	8.9	1.7	1.9	0.3	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Anaerobic Digestion	Landfill Gas	143.4	95.8	18.2	20.2	7.9	1.3
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	14.4	5.8	1.1	1.2	0.0	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Thermal Gasification	Agricultural Residue	42.1	8.9	0.0	0.0	0.0	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Thermal Gasification	Energy Crops	84.3	9.5	0.0	0.0	0.0	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Thermal Gasification	Forestry and Forest Product Residue	24.9	9.5	0.0	0.0	0.0	0.0
includes NYC, Westchester, ORU	ICF	Mid-Atlantic	Thermal Gasification	Municipal Solid Waste	242.7	91.6	0.0	0.0	0.0	0.0

Note: it's been assumed that we do not source RNG from thermal gasification facilities outside of our service territories

35.97 TBTU of total RNG assumed to be available to CEI from the Mid-Atlantic and the rest of the Eastern US (does not include RNG from within our service territories)

Calculating RNG within our service territories (TBTU):

Notes	Source	Region	Production Type	Feedstock	Technical Potential (max potential)	Acheivable Potential	RNG available in our service territories	
	NYSERDA	NYS	Anaerobic Digestion	Animal Manure	20.2	9.1		
	NYSERDA	NYS	Anaerobic Digestion	Food Waste	6.1	3.4		
	NYSERDA	NYS	Anaerobic Digestion	Landfill Gas	50.5	19.3		
	NYSERDA	NYS	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	7.1	2.4		
	NYSERDA	NYS	Thermal Gasification	Agricultural Residue	24.4	7.3		
	NYSERDA	NYS	Thermal Gasification	Energy Crops	69.1	18.6		
	NYSERDA	NYS	Thermal Gasification	Forestry and Forest Product Residue	42.2	4.8		
	NYSERDA	NYS	Thermal Gasification	Municipal Solid Waste	52.7	24.9		
	NYSERDA	NYC (CECONY + NGRID)	Anaerobic Digestion	Animal Manure	7.3	0.0	0.0	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Anaerobic Digestion	Food Waste	2.2	1.4	0.6	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Anaerobic Digestion	Landfill Gas	18.3	6.1	2.5	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	2.6	1.5	0.6	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Thermal Gasification	Agricultural Residue	8.8	0.0	0.0	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Thermal Gasification	Energy Crops	25.1	0.0	0.0	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Thermal Gasification	Forestry and Forest Product Residue	15.3	0.0	0.0	removed Nat Grid
	NYSERDA	NYC (CECONY + NGRID)	Thermal Gasification	Municipal Solid Waste	19.1	10.8	4.5	removed Nat Grid
	NYSERDA	Hudson Valley	Anaerobic Digestion	Animal Manure	2.3	0.1		
	NYSERDA	Hudson Valley	Anaerobic Digestion	Food Waste	0.7	0.4		
	NYSERDA	Hudson Valley	Anaerobic Digestion	Landfill Gas	5.8	0.6		
	NYSERDA	Hudson Valley	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	0.8	0.1		
	NYSERDA	Hudson Valley	Thermal Gasification	Agricultural Residue	2.8	0.3		
	NYSERDA	Hudson Valley	Thermal Gasification	Energy Crops	7.9	0.9		
	NYSERDA	Hudson Valley	Thermal Gasification	Forestry and Forest Product Residue	4.9	0.2		
	NYSERDA	Hudson Valley	Thermal Gasification	Municipal Solid Waste	6.1	3.0		
	NYSERDA	Westchester	Anaerobic Digestion	Animal Manure	0.8	0.0	0.0	
	NYSERDA	Westchester	Anaerobic Digestion	Food Waste	0.2	0.1	0.1	
	NYSERDA	Westchester	Anaerobic Digestion	Landfill Gas	2.0	0.2	0.2	
	NYSERDA	Westchester	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	0.3	0.0	0.0	
	NYSERDA	Westchester	Thermal Gasification	Agricultural Residue	1.0	0.1	0.1	
	NYSERDA	Westchester	Thermal Gasification	Energy Crops	2.8	0.3	0.3	
	NYSERDA	Westchester	Thermal Gasification	Forestry and Forest Product Residue	1.7	0.1	0.1	
	NYSERDA	Westchester	Thermal Gasification	Municipal Solid Waste	2.1	1.1	1.1	
	NYSERDA	ORU	Anaerobic Digestion	Animal Manure	0.6	0.0	0.0	
	NYSERDA	ORU	Anaerobic Digestion	Food Waste	0.2	0.1	0.1	
	NYSERDA	ORU	Anaerobic Digestion	Landfill Gas	1.4	0.1	0.1	
	NYSERDA	ORU	Anaerobic Digestion	Wastewater Resource Recovery Facilitie	0.2	0.0	0.0	
	NYSERDA	ORU	Thermal Gasification	Agricultural Residue	0.7	0.1	0.1	
	NYSERDA	ORU	Thermal Gasification	Energy Crops	1.9	0.2	0.2	
	NYSERDA	ORU	Thermal Gasification	Forestry and Forest Product Residue	1.2	0.1	0.1	
	NYSERDA	ORU	Thermal Gasification	Municipal Solid Waste	1.5	0.7	0.7	

Results (TBTU):

Assumed RNG potential

Production Type	Feedstock	CEI share outside of service territories	CEI share within service territories
Anaerobic Digestion	Animal Manure	9.7	0.1
Anaerobic Digestion	Food Waste	1.5	0.8
Anaerobic Digestion	Landfill Gas	24.2	2.9
Anaerobic Digestion	Wastewater Resource Recovery Facilitie	0.5	0.7
Thermal Gasification	Agricultural Residue	0.0	0.2
Thermal Gasification	Energy Crops	0.0	0.5
Thermal Gasification	Forestry and Forest Product Residue	0.0	0.1
Thermal Gasification	Municipal Solid Waste	0.0	6.3
	Total	**36.0**	**11.6**
			47.5

Assumed RNG potential by region

NYC	8.3		
Westchester	2.0	O&R	1.3
Mid-Atlantic	10.9	Mid-Atlantic	1.7
Eastern U.S.	20.7	Eastern U.S.	2.7
Total CECONY	**41.8**	**Total O&R**	**5.7**
			47.5

Note: updated from ~51 TBTU in May 31st filing

Exhibit C

Company Name: Con Edison and O and R Utilities
Case Description: PSC Statewide Gas Planning Proceeding
Case: 23-G-0147

Response to Sierra Club/Earth Justice Interrogatories – Set SC and EJ-1
Date of Response: July 13, 2023
Responding Witness: N/A

Question No. :3
What is the projected industry growth in Orange & Rockland's service territory?
a. Please identify what type of industry, by subsector (for example, but not limited to, food manufacturing, meat processing, dairy processing, chemical manufacturing, paper production) Orange & Rockland anticipates will expand in its service territory.
b. Please explain how Orange & Rockland will decarbonize the industrial sector and identify what technology and/or method will be applied for each projected industrial subsector.

Response

a. Our volume forecast does not break out specific industries. While the Company does not explicitly break out food manufacturing, meat processing, dairy processing, chemical manufacturing or paper production in this forecast, Orange & Rockland industrial customers are captured in its service class (SC). A five-year compounded annual growth rate from the last forecast for the SC capturing these types of customers is **negative** 1.1%.

   The peak demand forecast is not broken out by service class. However, it does have two segments for large new commercial customers and oil to gas conversions that will capture industrial customers. The 20-year compounded annual growth rate for these two segments is approximately **negative** 7%

b. O&R's industrial sector will ultimately decarbonize through efforts made by the customer, local and state legislatures, and the trades and HVAC sectors. The New York State budget has enacted regulations that ultimately preclude the use of new natural gas construction for large commercial and residential buildings by 2027. As such, that sector's growth will be limited to exceptions or projects that were developed in prior years and decarbonization will be afforded through energy efficiency and electrification of those buildings. Electrification will only lead to meaningful decarbonization if electricity supply is from renewable sources of energy and the loss of refrigerant from heat pumps and the manufacturing of refrigerant is kept to a very low amount.

Exhibit D

Company Name: Con Edison and O and R Utilities
Case Description: PSC Statewide Gas Planning Proceeding
Case: 23-G-0147

Response to DPS Interrogatories – Set DPS-1
Date of Response: June 15, 2023
Responding Witness: N/A

Question No. :26
Please provide in excel format, the annual bill impact and net present value (NPV) cost analysis for traditional and alternative projects considered under the baseline and scenario plans (including a sensitivity that assumes full value of any new gas assets depreciated by 2050).
a.Please identify any deviations from uniform accounting practices and existing rate plans.
b. Please identify any assumptions in which discretion was applied, given a lack of other guidance

Response

Please see attachment DPS-1-26 Att. 1. Within section V of the Companies May 31st Gas System Long-Term Plan filing, accelerated depreciation is analyzed using a shortened standard lifecycle of gas investments. This section discusses the approach, previous analysis, as well as comparison to the Reference, Hybrid, and Deep Electrification scenarios. Please see response DPS-1-27 for global assumptions used in the bill impact calculations.

Investments CECONY

Reference

TYPE	Program Name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
CAPITAL	Leak Prone Main Replacement Program (MRP/GIRRP)	$370	$419	$440	$455	$474	$471	$471	$471	$471	$471	$468	$468	$468	$468	$468	$465	$465	$273	$0	$0
CAPITAL	Non Leak Prone Main Replacement Program (DIME)	$8	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9
CAPITAL	Service Replacement	$110	$109	$109	$114	$121	$113	$113	$113	$113	$113	$113	$113	$113	$113	$113	$113	$113	$69	$14	$14
CAPITAL	Pressure Control Projects	$20	$27	$27	$20	$20	$20	$20	$20	$15	$11	$9	$6	$5	$4	$3	$2	$2	$1	$1	$1
CAPITAL	Regulator Station Projects	$9	$9	$9	$9	$9	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6	$6
CAPITAL	Supply Mains Projects	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Large Diameter Gas Main Program	$7	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9
CAPITAL	Transmission/Generation Projects	$118	$124	$102	$93	$93	$93	$93	$93	$93	$93	$93	$93	$93	$70	$52	$39	$29	$22	$17	$12
CAPITAL	Meter Program (50%) / NGD (50%)	$60	$66	$64	$60	$60	$64	$65	$59	$55	$58	$64	$70	$68	$66	$66	$64	$64	$65	$68	$70
CAPITAL	Customer Connections	$66	$60	$54	$79	$79	$39	$31	$25	$20	$16	$13	$10	$8	$6	$5	$4	$3	$3	$0	$0
CAPITAL	System Reinforcement Program/Winter Load Relief	$36	$32	$33	$42	$42	$37	$37	$37	$30	$25	$20	$17	$15	$13	$12	$11	$10	$9	$9	$9
CAPITAL	Public Improvement	$127	$133	$139	$143	$149	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152	$152
CAPITAL	Low Carbon Fuels	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	LNG Projects	$39	$21	$5	$1	$1	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4
CAPITAL	Tunnel Projects	$9	$8	$3	$3	$3	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5
CAPITAL	AMI - Gas Meters	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Information Technology Projects	$3	$3	$4	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
REG ASSET	CES Programs	$59	$64	$65	$56	$43	$35	$27	$21	$18	$18	$18	$18	$4	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Gas Distribution Programs	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total		$1,047	$1,094	$1,072	$1,096	$1,114	$1,057	$1,042	$1,024	$1,000	$990	$983	$981	$960	$926	$905	$884	$873	$628	$293	$291
Total	w/ out reg assets	$988	$1,030	$1,007	$1,040	$1,071	$1,022	$1,015	$1,003	$982	$973	$966	$964	$956	$926	$905	$884	$873	$628	$293	$291
Total	w/ out Public Improvement	$920	$961	$933	$953	$965	$905	$890	$872	$848	$838	$831	$829	$808	$774	$753	$732	$721	$476	$141	$139

Hybrid Pathway

TYPE	Program Name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
CAPITAL	Leak Prone Main Replacement Program (MRP/GIRRP)	$370	$419	$440	$321	$318	$314	$242	$239	$239	$238	$238	$237	$236	$236	$235	$234	$233	$233	$70	$70
CAPITAL	Non Leak Prone Main Replacement Program (DIME)	$8	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9
CAPITAL	Service Replacement	$110	$109	$109	$114	$121	$113	$91	$91	$91	$91	$91	$91	$91	$91	$91	$91	$91	$91	$36	$36
CAPITAL	Pressure Control Projects	$20	$27	$27	$20	$20	$20	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5
CAPITAL	Regulator Station Projects	$9	$9	$9	$9	$9	$6	$6	$6	$6	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2
CAPITAL	Supply Mains Projects	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Large Diameter Gas Main Program	$7	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$0	$0	$0	$0
CAPITAL	Transmission/Generation Projects	$118	$124	$102	$93	$93	$93	$93	$93	$93	$93	$93	$93	$93	$5	$5	$5	$5	$5	$5	$5
CAPITAL	Meter Program (50%) / NGD (50%)	$60	$66	$64	$60	$60	$62	$34	$33	$52	$52	$51	$50	$49	$48	$47	$46	$45	$44	$43	$42
CAPITAL	Customer Connections	$66	$60	$54	$79	$79	$39	$4	$4	$4	$3	$3	$3	$3	$3	$3	$2	$2	$2	$2	$2
CAPITAL	System Reinforcement Program/Winter Load Relief	$36	$32	$33	$42	$42	$38	$38	$38	$32	$24	$18	$13	$10	$8	$6	$4	$3	$2	$2	$1
CAPITAL	Public Improvement	$127	$133	$139	$143	$149	$152	$152	$152	$152	$151	$150	$149	$148	$147	$146	$145	$144	$143	$143	$142
CAPITAL	Low Carbon Fuels	$0	$0	$0	$0	$0	$0	$0	$10	$10	$10	$10	$10	$10	$10	$10	$10	$10	$0	$0	$0
CAPITAL	LNG Projects	$39	$21	$5	$1	$1	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4
CAPITAL	Tunnel Projects	$9	$8	$3	$3	$3	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5
CAPITAL	AMI - Gas Meters	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Information Technology Projects	$3	$3	$4	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
REG ASSET	CES Programs	$59	$64	$65	$56	$43	$35	$27	$21	$18	$18	$18	$18	$4	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Gas Distribution Programs	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total		$1,047	$1,094	$1,072	$962	$958	$899	$718	$719	$727	$714	$705	$698	$678	$581	$577	$572	$560	$546	$327	$325
Total	w/ out reg assets	$988	$1,030	$1,007	$906	$915	$865	$691	$698	$710	$696	$688	$681	$675	$581	$577	$572	$560	$546	$327	$325
Total	w/ out Public Improvement	$920	$961	$933	$819	$809	$747	$566	$567	$576	$563	$555	$549	$530	$434	$430	$427	$415	$403	$185	$183

Deep Electrification Pathway

TYPE	Program Name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
CAPITAL	Leak Prone Main Replacement Program (MRP/GIRRP)	$370	$419	$440	$277	$277	$277	$110	$110	$110	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15	$15
CAPITAL	Non Leak Prone Main Replacement Program (DIME)	$8	$9	$9	$9	$9	$9	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
CAPITAL	Service Replacement	$110	$109	$109	$69	$69	$69	$27	$27	$27	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4
CAPITAL	Pressure Control Projects	$20	$27	$27	$20	$20	$20	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2
CAPITAL	Regulator Station Projects	$9	$9	$9	$9	$9	$6	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
CAPITAL	Supply Mains Projects	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Large Diameter Gas Main Program	$7	$9	$9	$9	$9	$9	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
CAPITAL	Transmission/Generation Projects	$118	$124	$102	$93	$93	$93	$98	$100	$102	$102	$102	$102	$102	$5	$5	$5	$5	$5	$5	$5
CAPITAL	Meter Program (50%) / NGD (50%)	$60	$66	$64	$60	$60	$66	$33	$33	$33	$33	$33	$33	$3	$3	$3	$3	$3	$3	$3	$3
CAPITAL	Customer Connections	$66	$60	$54	$79	$79	$40	$4	$4	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	System Reinforcement Program/Winter Load Relief	$36	$32	$33	$42	$42	$38	$4	$4	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Public Improvement	$127	$133	$139	$143	$149	$152	$155	$148	$141	$133	$126	$119	$112	$105	$97	$90	$83	$76	$68	$61
CAPITAL	Low Carbon Fuels	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	LNG Projects	$39	$21	$5	$1	$1	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Tunnel Projects	$9	$8	$3	$3	$3	$5	$1	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	AMI - Gas Meters	$4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Information Technology Projects	$3	$3	$4	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
REG ASSET	CES Programs	$59	$71	$66	$53	$34	$23	$14	$9	$6	$5	$4	$4	$3	$0	$0	$0	$0	$0	$0	$0
CAPITAL	Gas Distribution Programs	$1	$1	$1	$1	$1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total		$1,047	$1,101	$1,073	$869	$856	$811	$450	$440	$432	$297	$290	$282	$243	$136	$129	$122	$114	$107	$100	$93
Total	w/ out reg assets	$988	$1,030	$1,007	$816	$822	$788	$436	$431	$426	$292	$285	$278	$240	$136	$129	$122	$114	$107	$100	$93
Total	w/ out Public Improvement	$920	$968	$934	$726	$707	$659	$295	$292	$291	$164	$163	$163	$131	$31	$31	$31	$31	$31	$31	$31