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July 1, 2022

VIA ELECTRONIC FILING

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Sarah Osgood
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RE: Comments of National Grid on the Climate Action Council's December 31, 2021 Draft Scoping Plan

Dear President Harris, Commissioner Seggos, and Executive Director Osgood:

Niagara Mohawk Power Corporation d/b/a National Grid, The Brooklyn Union Gas Company d/b/a National Grid NY, and KeySpan Gas East Corporation d/b/a National Grid (together "National Grid") hereby submit their Comments on the New York State Climate Action Council's December 31, 2021, Draft Scoping Plan.

Please contact me if you have any questions, and thank you for your attention to these comments.

Respectfully submitted,

/s/ Carlos A. Gavilondo
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COMMENTS ON
NEW YORK STATE CLIMATE ACTION COUNCIL'S
DECEMBER 31, 2021, DRAFT SCOPING PLAN

Submitted to the New York State Climate Action Council

Submitted by:

nationalgrid

July 1, 2022

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nationalgrid

COMMENTS ON THE DRAFT SCOPING PLAN

1. Executive Summary

National Grid appreciates the opportunity to comment on the Climate Action Council's Draft Scoping Plan and commends the Council on its thoughtful approach and its efforts to solicit feedback and evaluate public input on the Plan. We are committed to New York's success in the energy transition. Achieving net zero emissions by 2050 will take tremendous commitment, and success will require not only great ambition but also a clear-eyed view of where we are starting from and how we can realistically meet the targets while preserving reliability and affordability. National Grid's comments on the Draft Scoping Plan recommend a balanced approach that prioritizes customer affordability and choice, emphasizes energy efficiency, leverages existing gas infrastructure to accelerate decarbonization, and promotes targeted and advanced electrification. To enable this vision and preserve optionality for a range of potentially viable solutions, the CAC should consider the following changes for the Final Scoping Plan:

- **The Scoping Plan should include information to enable New Yorkers to understand the benefits, costs, and risks of the different pathways for achieving decarbonization.** The CAC's analysis should set out the detailed assumptions underlying each pathway and provide an assessment of the ability to deliver key milestones. While the Draft Scoping Plan presents aggregate net present value projections of costs of the scenarios analyzed, the Final Scoping Plan should include information on each pathway's estimated financial impacts on households and business sectors.
- **The Scoping Plan should adopt a hybrid pathway that includes heat decarbonization through an integrated electric and clean gas system.** Significantly increased electrification is essential to all pathways for achieving net zero by 2050. However, a hybrid approach that leverages decarbonized electric and gas networks provides a more practical and affordable pathway than the ones presented in the Draft Scoping Plan. The existing gas system can be repurposed to deliver clean alternative fuels, such as renewable

natural gas and hydrogen, saving New York customers billions of dollars in avoided electric generation, transmission, and distribution investments. Renewable natural gas (RNG) is pipeline-quality methane produced from biogenic processes.

- **The CAC should support policies that will scale supply and demand for renewable fuels.** Renewable fuels provide an opportunity for New York to advance net zero goals using existing network infrastructure. New York should drive toward net zero by establishing renewable gas procurement standards that would require gas utilities to procure a growing proportion of their gas from RNG and renewable, green hydrogen over time.
- **New York must drive investment in energy efficiency, including weatherization and renewable heating equipment, and put a price on fossil carbon emissions.** Achieving net zero will require a significant scale up in energy efficiency investments. There is no better tool for managing bills and lowering emissions than energy efficiency - enabling and encouraging customers to use less energy. Incentives should support efficiency across all fuel types to reduce greenhouse gas emissions, and innovative program designs should be implemented to address impediments to customer adoption. Regulation of utility energy efficiency programs should align with the mix of measures being implemented, and needs to recognize that longer effective useful life (EUL) measures may require greater incentives for these longer-lived approaches, particularly during earlier stages when customers are still becoming familiar with the importance and benefits of the measures (such as building envelope retrofits). Customer adoption will be most successful if entities across public and private spheres (in addition to utilities) promote adoption of energy efficiency and assist with developing the supply chain and contractor network to enable deep efficiency retrofits. More generally, market-based carbon pricing mechanisms should be established to provide clear price signals across the economy to support cost-effective decarbonization, and to provide an on-going source of funding for efficiency programs and other initiatives and investments to enable decarbonization.
- **New York should continue to evolve infrastructure planning and enable utility investment in advanced fuels and electrification**. Regulatory planning processes should support long-term network strategies that promote the most efficient and coordinated use of the gas and electric systems, including investments that support transport electrification

and targeted fossil-free strategies (such as hydrogen clusters, thermal energy networks, or electrified neighborhoods). Electric and gas planning practices, service regulations, and cost recovery should support both the delivery of renewable gas, reduction in overall gas demand, and increase in overall and electric demand over time. Sufficient regulatory funding should be provided for the research, development, and demonstration (RD&D) of innovative technologies required to meet state climate targets.

- **Ensure consistent greenhouse gas accounting methods**. Transparent and consistent greenhouse gas (GHG) emissions accounting methods are essential across all sectors of the economy, including the energy sector. Accounting methods should be standardized across state and federal jurisdictions, and as consistent as possible with the international standards that are framing climate goals.
- **The State should do more to create awareness among average customers and other stakeholders of the issues under consideration in this process**. Utilities, regulators, developers, environmental advocates, and those for whom climate change is a "top of mind" issue are deeply engaged in the Scoping Plan process. However, the general public is not as deeply engaged and have little to no awareness of the broad implications the Final Scoping Plan will have on their daily lives. The Climate Action Council should continue and expand its public education campaign prior to finalizing the Scoping Plan. In keeping with the importance of prioritizing a just transition and serving disadvantaged communities, special attention to outreach to these communities is also essential.

We must achieve a net-zero GHG emissions future to avoid the worst impacts of climate change. The transition must be across all sectors of our economy and will require fundamental changes. We urge the Climate Action Council to prioritize affordability, recommend policies that maintain optionality for a range of potential solutions and, specifically, consider a pathway that utilizes existing energy networks, deeply incentivize energy efficiency and weatherization, recommend the adoption of fuel standards to support fossil free gas in New York, and develop emissions accounting methodologies that align with other state, federal and international standards.

Climate change is a global challenge requiring global action. New York State is taking a leading role not only within the US, but internationally, with implementation of the CLCPA. New York's ability to implement the Climate Act successfully will set an example for other states and

countries in their approaches to meeting our collective climate goals. National Grid is committed to working with the CAC, regulators, and other stakeholders on a roadmap for achieving these goals and equitably and affordably delivering New York's clean energy future.

The remainder of our comments are structured as follows:

- **Section 2** outlines key principles critical to achieving the energy transition in New York;
- **Section 3** reviews National Grid's commitment to and vision for achieving net zero by 2050;
- **Section 4** presents recommended changes to the Draft Scoping Plan and policy initiatives necessary to support a balanced, hybrid pathway; and
- **Section 5** concludes our comments.

Appendix A to National Grid's Comments provide a high-level summary of the Company's recommendations for revisions to the Draft Scoping Plan.
Appendix B provides more in-depth commentary on select chapters of the Draft Scoping Plan.

2. Key Principles in the Energy Transition

The Climate Action Council (CAC) is tasked with framing the State's approach to achieving the climate targets set forth in the groundbreaking Climate Leadership and Community Protection Act (CLCPA).[1] Given the imperative to move with pace and deliver on these ambitious targets, the CAC cannot merely develop theoretical, idealized solutions for achieving a decarbonized energy future, but rather it must identify an actionable energy transition pathway for New York that carefully considers affordability, safety and reliability, implementation risks, societal factors, technology, and the impacts on environmental justice and disadvantaged communities. New York's diverse economy, geography, and demographics further underscore the need for policy solutions that maximize practicality and flexibility and avoid mandates and other "one size fits all" approaches. Our comments and proposed revisions to the Draft Scoping Plan are grounded in a set of principles that we believe are fundamental to achieving our shared goals:

i. Maintaining energy affordability is essential to the success of the energy transition.
ii. The path to net zero must preserve reliability and resiliency of the energy system.
iii. The energy transition must be just and equitable for all New Yorkers, especially economically vulnerable customers and disadvantaged communities.
iv. The energy transition must be fair to workers who have dedicated their careers to providing our society with safe and reliable energy service.
v. Decarbonization should not come at the expense of energy security.

Preserving energy affordability and choice is critical for customers and key to retaining and attracting business at a time when economic recovery is more important than ever. Utilities, regulators, and other stakeholders must collaborate to fairly balance investment in infrastructure with the need to maintain affordability and protect our most vulnerable customers. Affordability and minimizing customer disruption are key to customer support for—and ultimately the success of—the transition to net zero. Pathways that do not adequately assess affordability, customer acceptance, and adoption rates do not provide a sufficiently informed view of the customer and economic implications of achieving net zero, increasing the risk that policy decisions fail to achieve desired reductions or have unforeseen adverse economic impacts. For example, proposals to eliminate access to gas and gas appliances in the relatively near future must

[1] Chapter 106 of the laws of 2019.

demonstrate that customers will have viable, affordable alternatives – at the risk of frustrating customers and progress on decarbonization. To achieve the 2050 net zero targets in electrification-focused scenarios, the DSP acknowledged that "adoption of measures to transition the fossil gas system will be heavily dependent on end-use customer adoption of enhanced energy efficiency, demand response, and electrification."[2] Achieving the electrification levels presented in the Draft Scoping Plan means annual installations would have to be approximately 20 times higher than historical adoption rates by the end of this year and sustain these same high rates through 2030.[3] If this rapid increase is not achieved in time, reaching over 90% adoption of electric heat pumps by 2050 would require significant levels of early retirement of heating equipment, which could be close to 50% of gas heaters. To enable a fair assessment, the Final Scoping Plan must include a detailed analysis of the implementation/customer adoption assumptions and risks, and the cost impacts on customers and business segments to enable a fair comparison of each pathway, and also must include specific information on the impact on Disadvantaged Communities.[4]

Additionally, State climate policy should do more to ensure that all sectors – government, the private sector, utilities, and advocacy organizations – are working to educate customers about the need to make changes to conserve energy, presenting clear and reliable information about the options available for upgrades in their home or building, and persuading the public that the costs and inconveniences of making changes are outweighed by the benefits – to their home or business, and to society. Utilities and NYSERDA have done much to date in this regard, and will continue to advance outreach and marketing efforts in connection with energy efficiency and heat pump offerings – however the task of changing public opinion to encourage a significant portion of the

[2] Draft Scoping Plan at 266.

[3] VEIC Ramping Up Heat Pump Adoption in New York State at 4; estimates air-source heat pump adoption rates of roughly 43,418 homes in 2016. https://www.veic.org/Media/default/documents/resources/reports/veic-ramping-up-heat-pump-adoption-in-new-york-state.pdf.

[4] *See, e.g.*, Draft Scoping Plan, Appendix G, Section I, p. 9 ("Although benefits and costs are in the same range across mitigation scenarios, risk levels differ by scenario. Although all scenarios involve a high degree of transformation across strategies and sectors, very high levels of transformation increase risk of delivering GHG emission reductions. *Types of risk include* reliance on technologies in early stages of *development* which require substantial innovation (e.g., negative emission technologies, carbon capture and storage, advanced low-carbon fuels), *reliance on widespread adoption of technologies that are in the early stages of deployment* (e.g., zero-emission vehicles, heat pumps), and reliance on strategies that require the highest levels of transformation of social institutions and business models (e.g., land use patterns, mobility practices, waste management)") (emphasis added).

State to undertake home construction projects and alter appliances merits a coordinated effort across sectors. Similarly, state policy must do more to bring about the changes in the sectors of the economy upon which building weatherization, heat pump installation and other electrification-related activities rely. Specifically, utilities have identified significant shortages in qualified contractors to perform this work. Additionally, supply chain issues are limiting the availability of building materials in relation to current targets with regard to these activities. State, federal and local government support through policy changes and other leadership initiatives, including coordination with the private sector, will be needed to ensure market readiness as targets increase year over year.

At the same time, the State's climate policies also must not be so costly or onerous to drive out residents and businesses. To the extent climate policies result in excessive costs, adverse reliability impacts, or other conditions that lead businesses or residents to relocate to other states, such a result would cause not only economic leakage, but also result in emissions leakage that would frustrate the CLCPA's goal to mitigate climate change as those relocating would likely continue to emit GHGs elsewhere that would directly affect New Yorkers.[5]

Achieving the CLCPA targets, regardless of the policy instruments chosen, implies billions of dollars in new costs between now and 2050. Policy choices should be focused on utilizing all available decarbonization options to enable least-cost emissions reductions and implementing market-based approaches where feasible. Policies that set a price on carbon emissions will encourage the lowest cost emissions reductions, while also generating revenues that can support funding of decarbonization efforts and mitigation of customer bill and competitiveness impacts.

Achieving net zero targets over the next few decades will be challenging, but we have a greater chance of succeeding if we embrace all options versus picking winners and losers.[6] A

[5] Draft Scoping Plan, Appendix C, p. C-1.

[6] *See, e.g.,* Draft Scoping Plan, Appendix A, p. A-77 (acknowledging the need to keep options open to meet the needs of the energy transition: [E]ven after full deployment of available clean energy technologies, there is a remaining need for 15-25 GW in 2040 to meet demand and maintain reliability, although that gap may change over time. Whether the answer is new long duration battery technology, RNG, advanced green hydrogen, nuclear, overbuilding of renewable technologies or other new technologies that may emerge due to R&D efforts over the next two decades, the costs are likely to be high and aggressive action and smart planning will be challenging to make these fundamental shifts in our energy systems in two decades").

hybrid approach can achieve New York's net zero targets more affordably and with less reliance on extremely high and untested appliance adoption rates.

New York's transition to a net zero future must balance the imperative to reduce carbon emissions with the critical need to maintain reliability and resiliency. A decarbonization approach that fails to consider all the interdependencies of the very complex energy ecosystem and broader economy will frustrate customers, increase costs, impair reliability, and ultimately prove counterproductive to advancing energy policy and reducing emissions. Identifying and implementing viable solutions will require the input of regulators, utilities and other experts who understand and can navigate the complexity of providing essential utility services to the millions of customers that rely on New York's energy networks for essential, life-sustaining services every day of the year and under all types of conditions. During a period of great change in the energy industry, and in the face of uncertainty in the wider economy, coordination and alignment among government, regulators, customers, and other key stakeholders is critical to enabling energy companies to make necessary long-term investments that will clear the way for the transition to New York's energy future. It is also critical that New York avoid an approach that adopts piecemeal energy legislation that fails to consider broader implications on reliability and achieving net-zero (*e.g.*, uncoordinated gas bans in municipalities). Among other reasons, policies that eliminate access to gas must be carefully considered given the potential economic consequences of shifting the costs of the gas system onto a smaller group of customers (particularly with respect to low- and moderate-income (LMI) customers), lack of feasible options for hard-to-electrify sectors and uses, and implications for energy system reliability. As the stewards of energy networks that have served generations of New Yorkers, electric and gas utilities are well positioned to inform the discussion on reliability implications of different decarbonization pathways – and the CAC must carefully consider their input.

Nothing is more fundamental to the public health and welfare than reliable energy. As the New York Public Service Commission (NYPSC) recently observed, the "failure to maintain safe and adequate electric and gas systems throughout the state would undermine the intent of the CLCPA."[7] For its part, the New York Independent System Operator (NYISO) recognized in its

[7] Case No. 20-G-0381, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Gas Service*, "Order Adopting

Comprehensive Reliability Plan that "[a]s we move to a zero-emissions grid, it's critical that we understand how the growth of intermittent resources and extreme weather could impact the ability to maintain reliability of the New York bulk electric system."[8] Indeed, the February 2021 electric and gas outages in Texas (Winter Storm Uri) highlighted the very significant health and safety consequences of under-investment in energy infrastructure.

As we pursue decarbonization strategies, we must also ensure that electric and gas utilities are not impeded from continuing to provide safe, affordable, and reliable service to customers. For example, even as we look to electrify customers where practical, it will take many years to transition residential and small commercial customers away from conventional gas. In the meantime, gas utilities will need to provide safe and reliable service to these customers at just and reasonable rates, which will necessitate smart investments in infrastructure to enable reliability and reduce methane emissions.[9] Restraints on prudent infrastructure and supplies in the near term without fully analyzing the impacts of such restraints could imperil reliability, impair the ability to achieve emissions targets, and leave customers without options. Relying on both a net zero gas

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Terms of Joint Proposal, Establishing Rate Plans and Reporting Requirements (issued and effective January 20, 2022)," at 80 ("[The Commission's CLCPA] analysis must be made in consideration of the Commission's statutory obligation to ensure that '[e]very gas corporation, every electric corporation and every municipality . . . furnish[es] and provide[s] such service, instrumentalities and facilities as shall be safe and adequate and in all respects just and reasonable.' We note that this statutory obligation long pre-dates enactment of the CLCPA and remains the Commission's core responsibility. Indeed, failure to maintain safe and adequate electric and gas systems throughout the state would undermine the intent of the CLCPA."); *see also* Case 22-M-0149, *In the Matter of Assessing Implementation of and Compliance with the Requirements and Targets of the Climate Leadership and Community Protection Act*, Order on Implementation of the Climate Leadership and Community Protection Act (issued and effective May 12, 2022), at 11 ("the Commission firmly believes that the transition to an emissions-free grid will occur only if the electric system remains reliable throughout the transition").

[8] https://www.nyiso.com/documents/20142/2248481/2021-2030-Comprehensive-Reliability-Plan.pdf/99a4a589-7a80-13f6-1864-d5a4b698b916

[9] National Grid is continuing to reduce emissions through replacement of 220 miles of LPP per year in New York, while assessing advanced leak detection technologies for prioritizing the repair of non-hazard leaks; *see also,* Comments by The Utility Consultation Group, Renewable Intermittency and The Importance of Dispatchable Generation in The Winter: New York Electric Market Case Review – January 2022 (report date April 22, 2022) (reviewing actual electric system performance and concluding, among other things, "[T]he real-life observed availability of intermittent generation in January 2022 underscores the importance of implementing the CLCPA transition in a measured manner to ensure system reliability and public safety are maintained. Coordinated optimization of the electric and gas energy systems and maintaining flexibility in technology development will facilitate meeting CLCPA requirements while supporting continued high levels of energy reliability").

system and electric network can reduce the risk of relying on a single solution for the region's energy needs.

The energy transition must ensure climate justice and carefully consider the effects on disadvantaged communities. Not all customers are equally affected by the costs of their monthly energy bills, and environmental justice demands attention to communities that bear disproportionate environmental burdens and climate change vulnerability. Helping the most economically vulnerable customers adopt solutions to achieve decarbonization is essential to energy equity – ensuring that all customers and communities can afford to have the clean energy they and their families need. National Grid supports the CLCPA's emphasis on providing support for Disadvantaged Communities and prioritizing clean energy investments in those communities. We also agree that support from state or federal funding is needed to assist with ensuring a Just Transition, including assisting with workforce development. New York cannot support an energy transition that is not inclusive of all customers, especially low- and moderate-income households and households in Disadvantaged Communities. Many of the communities we serve also face inequitable environmental impacts, whether from localized sources of emissions, or the impacts of climate change. Fairness, affordability, and equity will continue to be central to our strategy for addressing climate change, ensuring that every customer has access to affordable and reliable energy, and that we all share the benefits of a net zero future. New York can maintain affordability by leveraging existing assets to advance decarbonization to limit the amount of electric infrastructure that must be constructed, expanding programs to support energy efficiency, and establishing policy and regulatory approaches that support supply development and cost reductions for RNG and hydrogen. Policies and regulatory frameworks must also support long-term affordability, resiliency, and consider how anticipated changes in system utilization should impact how costs are borne between current and future gas customers.

We must leverage New York's skilled workforce. A hybrid electric/decarbonized gas plan leverages the capabilities of New York's existing gas workforce, including a significant number of highly skilled and experienced union workers, to achieve net zero goals. This experience is critical for ensuring the safe and reliable operation of the gas network throughout the energy transition. Independent assessments have acknowledged the challenge of implementing

workforce transition plans with rapid electrification of utility customers.[10] A hybrid approach supports both local distribution company (LDC) operation and the ability to develop satisfactory training opportunities for individuals interested in transitioning to roles within the electric industry or alternative energy technology fields. National Grid's plan allows for more orderly electrification and continued utilization of a decarbonized gas network that would allow the gas workforce to use their existing skill set to support the net zero transition. National Grid and other utilities' skilled workers are uniquely qualified to help enable this clean energy transition. This workforce can transform our existing gas system to deliver RNG and green hydrogen, as well as install new technologies such as thermal energy networks, at scale. Any viable pathway for achieving decarbonization must harness the value of this exceptional workforce.

Decarbonization should not come at the expense of energy security, and New York's pathway to net zero must reflect a realistic assessment of supply chain risks. Timely and affordable access to the hardware and materials needed for reliable electric service will be essential in the transition to clean energy, and will become more critical as more jurisdictions implement their own transitions. A hybrid electric/decarbonized gas plan that includes RNG can reduce potential supply chain risks. A recent U.S. Department of Energy publication identified several energy technologies key to the energy transition as being "highly dependent on insecure foreign sources":[11]

- "70% of the global supply of cobalt—a key input for lithium-ion batteries—comes from the Democratic Republic of the Congo . . . with China controlling 72 percent of global cobalt refining . . ."[12]
- "China controls roughly 80 percent of rare earths production and refining that are key for components in technologies such as direct drive generators in wind turbines, and China also controls 61 percent of global lithium refining key for battery storage and electric vehicles. China also controls 100 percent of the processing of natural graphite used for battery anodes . . ."[13]

[10] Docket No. DPU 20-80, Energy & Environmental Economics ("E3") with ScottMadden, "The Role of Gas Distribution Companies in Achieving the Commonwealth's Climate Goals: Technical Analysis of Decarbonization Pathways" dated March 18, 2022 (the "MA Decarbonization Pathways Report") at 95.
[11] *America's Strategy to Secure the Supply Chain for a Robust Clean Energy Transition*, U.S. Department of Energy Response to Executive Order 14017, "America's Supply Chains," p. 13 (Feb. 24, 2022) (hereafter "Clean Energy Transition Supply Chain"), *available at* https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain.
[12] *Id.* at 13.
[13] *Id.*

- “Currently, the United States does not refine any [Class]1 nickel, cobalt, or manganese, and only refines 3% of the world’s lithium. Except in the case of C1 nickel refining, for which Russia leads, China has near absolute dominance of today’s refining capacity for metals necessary for lithium-ion batteries.”[14]
- “About 97% of the world’s production of silicon wafers occurs in China. . . . About 75% of the silicon solar cells incorporated into modules installed in the United States are made by Chinese subsidiaries . . . in: Vietnam, Malaysia, and Thailand. . . . [T]he United States has no active [crystalline silicon], wafer, or cell production. . . .The United States does have production capacity for thin-film [cadmium telluride] modules, which do not rely on obtaining materials from Chinese companies. The U.S. PV installations using [cadmium telluride] modules (16% of the total) were all supplied by a single U.S. company that produced roughly one-third of those modules in the United States.”[15]
- “[L]ittle rare earth separation and metal refining capacity exists outside of China, with very limited to no current U.S. domestic capability. . . . U.S. decarbonization goals are reliant on both Chinese firms and the Chinese government.”[16]

Recent news has highlighted how these supply chain risks cause significant delays, cancellations, and budget increases for clean energy projects, which have been further exacerbated by international trade concerns.[17]

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[14] *Grid Energy Storage Supply Chain Deep Dive Assessment*, U.S. Department of Energy Response to Executive Order 14017, “America’s Supply Chains,” p. 19 (Feb. 24, 2022) (hereafter “Grid Energy Storage Supply Chain”), *available at* https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain

[15] *Solar Photovoltaics Supply Chain Deep Dive Assessment*, U.S. Department of Energy Response to Executive Order 14017, “America’s Supply Chains,” pp. iii-iv (Feb. 24, 2022) (hereafter “Solar PV Supply Chain”), *available at* https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain.

[16] *Rare Earth Permanent Magnets Supply Chain Deep Dive Assessment*, U.S. Department of Energy Response to Executive Order 14017, “America’s Supply Chains,” p. 46 (Feb. 24, 2022) (hereafter “Rare Earth Supply Chain”), *available at* https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain.

[17] Nichola Groom, *How a battery shortage is hampering the U.S. switch to wind, solar power,* Reuters (June 9, 2022), https://www.reuters.com/business/sustainable-business/how-battery-shortage-is-hampering-us-switch-wind-solar-power-2022-06-09/; Emma Penrod, *Tensions rise as renewable energy CEOs debate next steps after tariff, supply chain challenges,* Utility Dive (June 10, 2022) https://www.utilitydive.com/news/renewable-energy-ceo-debate-next-steps-after-commerce-tariff-supply-chain-upsets/625228/; Ana Swanson and Chris Buckley, *Red Flags for Forced Labor Found in China’s Car Battery Supply Chain,* The New York Times (June 20, 2022) https://www.nytimes.com/2022/06/20/business/economy/forced-labor-china-supply-chain.html; Elliot Smith, *‘Downright scary and untenable’: Commerce secretary warns U.S. needs to secure a future for its chip industry,* CNBC (May 25, 2022) https://www.cnbc.com/2022/05/25/gina-raimondo-warns-us-needs-to-secure-future-for-chip-industry.html.

By contrast, as noted in a recent report by the International Energy Agency, "hydropower and bioenergy are unlikely to face any significant supply constraints for minerals."[18] Indeed, New York State has access to the bioenergy and RNG feedstocks (*e.g.*, landfills, farms, and other organic waste), infrastructure, and skilled workforce that mitigate some of the more visible supply chain concerns facing the energy transition.

RNG protects against global supply chain risks and has the added benefit of mitigating the effects of excess landfill waste.[19] New York has historically supported methane capture and RNG, which, as compared to other emerging clean energy technologies, offers minimal technology risk. For example, New York's Climate Resilient Farming (CRF) Program has provided millions of dollars in grant funding for waste storage cover and flare for methane reduction at New York farms,[20] and NYSERDA has reported providing incentive support for forty anaerobic digester (ADG) projects totaling approximately 18 MW.[21]

Actions have been taken to address these supply chain issues, including the Biden administration invoking the Defense Production Act to accelerate domestic clean energy manufacturing[22] and secure critical minerals for clean energy technologies.[23] These are critical steps, and the Draft Scoping Plan rightly acknowledges the need and makes recommendations

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[18] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions*, *Hydropower and bioenergy: Limited impacts on mineral demand due to low material intensity*, p. 72 (Revised March 2022), *available at* https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions.

[19] Governor Hochul's State of the State noted that: "[T]he entire waste industry account[s] for an estimated 12 percent of the state's greenhouse gas emissions. The weakened market has also put a serious strain on the New York's recycling system, exacerbated by China's 2018 decision to stop importing recyclable materials. Municipalities cannot handle or afford this burden, and as a result, more waste ends up in landfills, which means more greenhouse gas emissions. . . [T]here are over 7 million tons of paper and packing waste generated on an annual basis." Governor Kathy Hochul, New York State of the State: A New Era for New York, 2022, p. 165 *available at* https://www.governor.ny.gov/sites/default/files/2022-01/2022StateoftheStateBook.pdf.

[20] New York State Department of Agriculture and Markets, Climate Resilient Farming, *awarded project descriptions available at* https://agriculture.ny.gov/soil-and-water/climate-resilient-farming#:~:text=The%20goal%20of%20the%20Climate,a%20changing%20climate%20(adaptation) (Last viewed on June 14, 2022).

[21] New York State Distributed Energy Resources, Characteristic Data, *data is available for download at* https://der.nyserda.ny.gov/data/characteristic/ (Last viewed on June 14, 2022).

[22] https://www.energy.gov/articles/president-biden-invokes-defense-production-act-accelerate-domestic-manufacturing-clean

[23] https://www.whitehouse.gov/briefing-room/presidential-actions/2022/03/31/memorandum-on-presidential-determination-pursuant-to-section-303-of-the-defense-production-act-of-1950-as-amended/

regarding building out a domestic supply chain.[24] It is not clear how long it will take to establish domestic manufacturing or to secure new, reliable sources of clean energy hardware and materials to overcome these supply chain constraints. Nevertheless, choosing a preferred pathway to achieve net zero should include an assessment of supply chain factors that could reasonably affect the success of that pathway. Absent confidence in a stable and robust supply chain for the materials and technologies needed to advance the energy transition, it would be unreasonable for New York to reject a decarbonization pathway that can produce near-term emissions reductions without such supply chain concerns.

3. National Grid's Vision for Achieving Net Zero

a. Our Commitment to the Energy Transition

National Grid is one of the world's largest energy companies serving millions of customers in the United Kingdom and United States (where we serve more than six million customers throughout New York and Massachusetts). In New York, we operate more than 70,000 miles of electric and gas networks that serve more than four million customers, who rely on us every day to provide essential, life-sustaining energy services.[25] We have more than 8,000 New York-focused employees living and working in the communities we serve. We hold a deep commitment to addressing the challenge of climate change, while maintaining affordable and reliable energy for all. These commitments are evident in our *Northeast 80 x 50 Pathway White Paper* (2018) that identified strategies for the region to reduce economy-wide emissions; our *Net Zero by 2050 Plan* (2020) laying out commitments to achieve net-zero greenhouse gas emissions by 2050 from both our own operations and the emissions resulting from the sale of electricity and gas to customers – making us one of the first utilities to set such targets; and in our role as a Principal Partner for the 26th United Nations Climate Change Conference of the Parties (COP26). And we have already delivered meaningful progress towards our net-zero plans.

[24] For example, the Draft Scoping Plan recommends economic incentives to develop an in-State supply chain of green economy businesses at p. 19, provides that a robust in-state energy and manufacturing supply chain is a just transition principle at p. 42 and recommends promoting local manufacturing of clean energy components and equipment at p. 44.

[25] National Grid's three New York operating companies (Niagara Mohawk Power Corporation, The Brooklyn Union Gas Company, and KeySpan Gas East Corporation, doing business as National Grid) own and operate electricity transmission facilities and distribution networks across upstate New York, as well as gas distribution networks across upstate New York, New York City, and Long Island.

In the last five years in the northeast U.S., we have connected 2,000 megawatts (MW) of distributed solar and 180 MW of battery storage; supported $3.1 billion in energy efficiency investments for our U.S. customers; enabled over 4,400 electric vehicle charging ports; slashed methane emissions by replacing hundreds of miles of leak prone main; and, as of 2020, reduced our Scope 1 and 2 greenhouse gas emissions by 67% from our 1990 baseline. Looking forward, we are actively pursuing a portfolio of innovative energy solutions to advance the clean energy transition, including: piloting a hydrogen demonstration project in the Town of Hempstead on Long Island; conducting hydrogen blending research with the Department of Energy at Stony Brook University; collaborating with a New York energy startup on the nation's first hydrogen energy transfer station that will produce and storage green hydrogen and use that hydrogen for energy products that will support customers, partnering with the New York Power Authority (NYPA) on the Smart Path Connect project to rebuild 110 miles of transmission lines to unlock renewable generation in the North Country; and implementing an innovative income-eligible solar program (known as "Expanded Solar for All") together with the New York State Energy Research and Development Authority (NYSERDA) to expand the reach of solar energy to historically underserved customer segments.

Most recently, in April 2022, we announced our *Clean Energy Vision*,[26] a plan to decrease reliance on fossil fuels from our U.S. gas and electric systems, enabling the homes and businesses we serve to meet their energy needs without the use of fossil fuels by 2050. This commitment recognizes our critical role in leading the clean energy transition for future generations of customers. Our plan rests on four pillars: first, aggressively accelerating insulation and energy efficiency improvements to buildings; second, supporting cost-effective, targeted electrification on our gas network, including piloting networked geothermal solutions, to electrify as much as 50% of the heating load by 2050; next, in areas where full electrification may not be practical or cost-effective, providing customers with the tools to pair electric heat pumps with their gas appliances; and, finally, eliminating fossil fuels from our existing gas network no later than 2050

[26] https://www.nationalgrid.com/us/fossilfree

by delivering renewable natural gas (RNG)[27] and green hydrogen[28] to customers. As discussed more below, this hybrid approach offers the promise of a more diversified, affordable and achievable net-zero future than pathways that rely exclusively on electrification – which is why our plan has been endorsed by a broad range of industry, community, business, and labor interests.[29]

b. National Grid's Vision for Achieving the Energy Transition

According to the Draft Scoping Plan, the buildings sector accounted for approximately 32% of statewide emissions in 2019 and was the largest emitting sector that year.[30] Direct emissions from the buildings sector come from on-site combustion of fossil fuels, primarily for space and water heating. Heating is provided by a very diverse set of fuels and heating systems. Of the roughly 7.4 million households in New York, nearly 4.5 million (60.7%) have a gas furnace or boiler system, 1.7 million (23%) use a boiler fueled by oil or propane, and 0.9 million (12.2%) use electricity.[31] Of those using electricity, most use electric resistance, an inefficient heating source, and much small number use a heat pump – an efficient means of providing both heating and cooling. The Draft Scoping Plan recommends that the current gas distribution system will need to be downsized substantially to transition away from fossil fuels.[32] This would mean nearly all 7.4 million households change their heating systems to electric heat pumps by 2050, requiring over 250,000 consumers per year converting their current heating source to electricity, every year until 2050.[33]

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[27] RNG is pipeline-quality biomethane produced from biomass or biogas. Biogas is a renewable energy; it is created as a direct result of transforming organic waste using anaerobic digestion.

[28] Hydrogen, the most abundant chemical element on earth, offers enormous potential as a source of clean energy. When hydrogen is produced with renewable feedstocks it is known as green hydrogen and is carbon free.

[29] Organizations expressing support for National Grid's fossil free vision include: The Business Council for Sustainable Energy, Long Island Association, Partnership for New York City, Buffalo Niagara Partnership, IBEW 1049, TWU Local 101, IBEW Local 97, the Institute for Gas Innovation and Technology, Center for Climate and Energy Solutions, Edison Electric Institute, CenterState CEO, and the Building and Construction Trade Council of Nassau and Suffolk Counties.

[30] Draft Scoping Plan at 119.

[31] https://www.eia.gov/state/print.php?sid=NY

[32] Draft Scoping Plan at 264.

[33] To achieve the 2050 emissions targets based on the high electrification scenarios set out in the Draft Scoping Plan, the State's 370,000 commercial and institutional buildings (*i.e.*, retail, restaurants, schools, *etc.*) would need to cut energy use by half and stop using fossil fuels for heating and hot water, and by 2030 more than 200,000 homes every year would need to upgrade to all-electric and energy efficient systems. Draft Scoping Plan, Appendix A, p. A-32.

Electrification will play a crucial role in meeting our climate goals to be sure, and National Grid promotes electrification where practical and cost-effective. We also will continue to play a major role in strengthening the electric transmission backbone to deliver energy from new large-scale renewable generation facilities to distant load centers, and interconnecting large-scale as well as small, distributed energy projects to the electric system to enable the energy transition. Our *Clean Energy Vision* relies on a high level of electrification. Under the hybrid pathway we have developed, 50% of heating would be provided by electric heat pumps, 25% would be hybrid electric heat pump/RNG gas systems, and 25% would be RNG heating. The *Pathways to a Carbon-Neutral NYC* study, a joint project from the NYC Mayor's Office of Sustainability, ICF, Con Edison, and National Grid, showed that inclusion of hybrid heating systems in a decarbonization pathway could substantially reduce the costly impacts on electricity networks from higher winter heating electricity demand.[34] An independent assessment commissioned in the Massachusetts decarbonization proceeding came to the same conclusion that "[a] coordinated gas and electric decarbonization strategy, utilizing a diverse set of technologies and strategies, is likely to be better able to manage the costs and feasibility risks of decarbonization than scenarios that rely more heavily on single technologies or strategies."[35]

The gas distribution system can facilitate decarbonization. Repurposing the gas system to deliver clean alternative fuels, such as renewable natural gas and hydrogen, will be necessary to decarbonize hard-to-electrify sectors and the electric generation sector as explained in the Draft Scoping Plan; but aggressively pursuing this approach now also would provide a zero-carbon complement to electrification of building energy uses that would (i) prevent further load increases on the electric system during a time when that system will also need to accommodate widespread switching to electric vehicles and substantial levels of building heating load, (ii) ensure that the costs to develop modern energy networks are fairly and equitably allocated among a wide base of customers, and (iii) be more cost-effective than complete and rapid electrification, which will

[34] https://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/Carbon-Neutral-NYC.pdf, at 45 (dual fuel heating systems in less than 6% of City's building stock could reduce electric peak demand by 7% during very cold winter weather from a full electrification pathway; the equivalent of one of Indian Point's nuclear generating units, translating into lower electric sector build-out and costs and less reliance on peaking units) ("Pathways to a Carbon-Neutral NYC").
[35] *MA Decarbonization Pathways Report* at 19.

require not only retrofitting but also significantly increasing non-emitting electric generation capacity and electric storage.[36]

National Grid's plan to deliver fossil-free energy networks in New York rests on four pillars: (i) accelerated and expanded energy efficiency in buildings; (ii) 100% fossil-free gas network; (iii) hybrid electric-gas heating systems; and (iv) targeted electrification and networked geothermal.

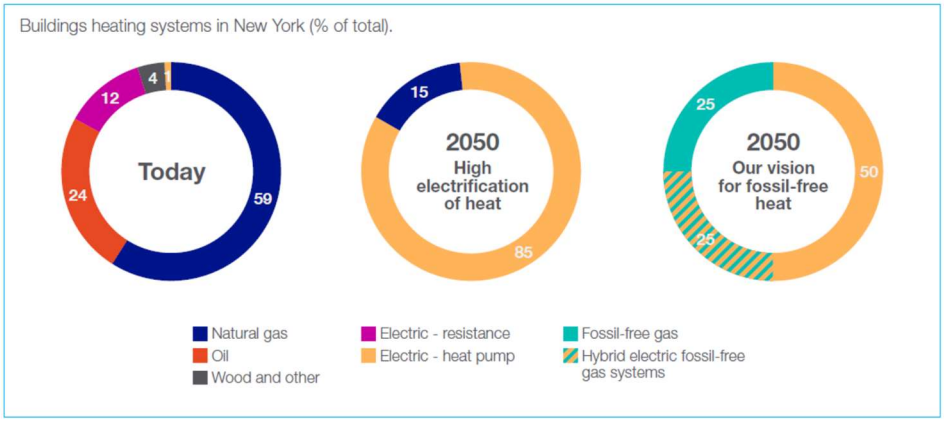
Pillars of our vision for fossil-free heat

Our roadmap to achieving these goals sets milestones out to 2050. We will work with elected officials and regulators to develop supportive legislation and regulatory policies by 2025. By 2030, we aim to serve 10-20% of customer gas demand with RNG while running community scale

[36] Such investments in the existing gas system will not lock in continued fossil fuel use into the future, but rather will ensure the system is prepared for advanced fuels that will promote decarbonization. *See, e.g.*, Columbia University Center on Global Energy Policy, *Investing In The US Natural Gas Pipeline System To Support Net-Zero Targets*, at 6 (April 2021) ("retrofitting and otherwise improving the existing pipeline system are not a choice between natural gas and electrification or between fossil fuels and zero-carbon fuels. Rather, these investments in existing infrastructure can support a pathway toward wider storage and delivery of cleaner and increasingly zero-carbon gases while lowering the overall cost of the transition and ensuring reliability across the energy system. In the same way that the electric grid allows for increasingly low-carbon electrons to be transported, the natural gas grid should be viewed as a way to enable increasingly low-carbon molecules to be transported") (available at: https://www.energypolicy.columbia.edu/research/report/investing-us-natural-gas-pipeline-system-support-net-zero-targets); see also Draft Scoping Plan, Appendix A, p. A-77 (noting the importance of keeping multiple options available during the energy transition).

projects blending hydrogen into the system.[37] By 2040, we aim to blend 20% green hydrogen and 30% RNG into the gas network, further laying foundations to supply 100% fossil-free gas to customers by 2050.[38] We anticipate that, by 2050, based on an aggressive hybrid pathway of targeted electrification and the coordinated development of RNG and green hydrogen resources, 50% of heating will be through heat pumps, 25% through fossil-free gas, and 25% through a hybrid of electric and fossil-free systems.

Building heating systems (% of total)



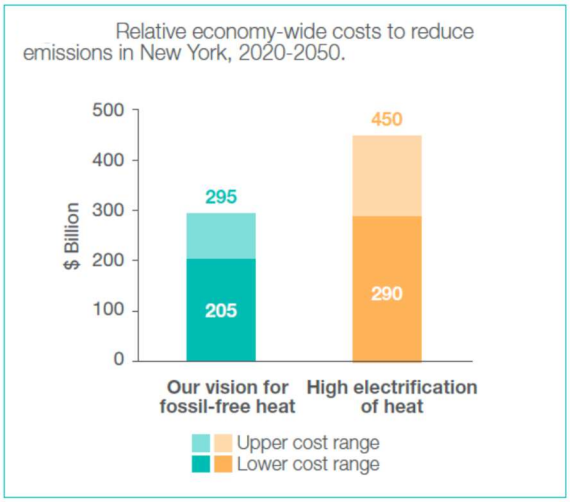
This hybrid pathway presents a more resilient and reliable solution for New York. The high electrification scenario presented in the Draft Scoping Plan relies almost exclusively on one energy network for power, transport, and heating. In addition, the weather characteristics of the Northeast make full-electrification more difficult, with a significant portion of the building stock categorized

[37] The total amount of gas delivered under the Company's Clean Energy Vision will be substantially less than the throughput on the system today. National Grid continues to promote measures designed to enable customers to adopt clean energy solutions that would advance the goals of the CLCPA. *See, e.g.*, Cases 19-G-0309 and 19-G-0310, Proceedings on Motion of the Commission as to the Rates, Charges, Rules and Regulations of The Brooklyn Union Gas Company d/b/a National Grid NY and KeySpan Gas East Corporation d/b/a National Grid for Gas Service, *Gas Customer Connection Costs and Electrification Incentives Report* (dated May 12, 2022) (proposing financial incentives to promote electrification for residential customers seeking new gas service).

[38] Such levels of RNG blending have been successfully achieved at scale already. *See Greening the Gas Grid in Denmark*, IEA Bioenergy Task 37 (Feb. 2019) ("As of 2019, more than 10% of the gas in the Danish gas grid is green throughout the year. In the summertime the decarbonized share is 25%. It is estimated that 100% of the expected gas consumption could be green by 2035"), *available at:* https://www.ieabioenergy.com/wp-content/uploads/2019/03/IEA_Greening-the-Gas-Grid_end.pdf.

as "hard to electrify."[39] By decarbonizing the gas network in parallel with the electric network, we can create a more resilient energy system. This approach also supports equitable outcomes for disadvantaged communities. By avoiding large upfront investments, this hybrid pathway enables all customers to have access to clean energy in the future. The benefits of a hybrid approach are substantial:

- **Given growing concerns over inflation and economic inequality, the issue of affordability is one of the most important factors when determining the best path toward net zero. The hybrid approach reduces the overall cost of achieving net zero** by repurposing existing infrastructure to deliver renewable clean energy. This avoids significant electric network buildout and reinforcement, reducing the scale of the requirement for long duration electricity storage (the 'unsolved problem' of the energy transition), and the upfront costs to customers associated with retrofitting their homes and buildings. The hybrid approach will deliver 15-20% lower home heating costs than a high-electrification approach. This will help keep energy costs more affordable for New Yorkers.



- **Preserves customer choice:** Customers will always be free to choose a 100% electric solution as they can today, but can continue to enjoy the benefits of increasingly decarbonized gas heating and cooking should they wish. Under the hybrid pathway, customers can reduce their carbon intensity even without purchasing all new appliances. Given the uncertainty associated with customer adoption/conversion rates,[40] using a

[39] McKinsey & Company, *Decarbonizing US Gas Utilities: The Potential Role of a Clean-Fuels System in the Energy Transition*, at 7-8 (March 2022), available at: https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/decarbonizing-us-gas-utilities-the-potential-role-of-a-clean-fuels-system-in-the-energy-transition.

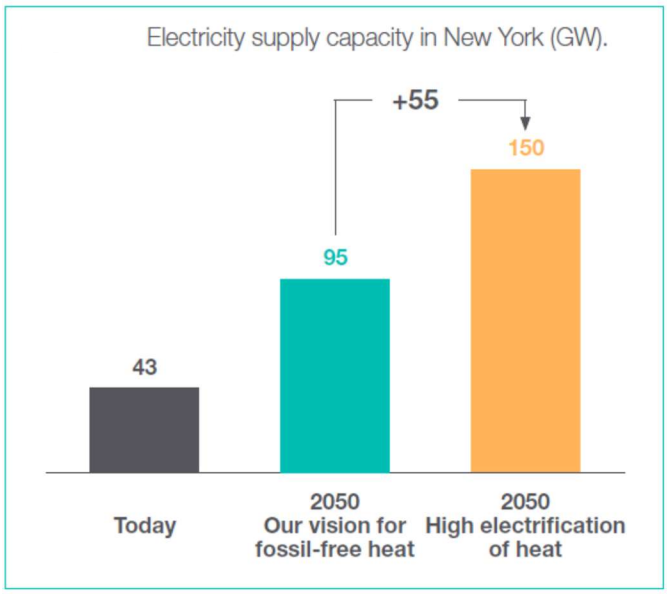
[40] *See* Draft Scoping Plan, Appendix G, Section I, pp. 8-9 ("Consumer decision-making plays a large role, especially for the purchase of new passenger vehicles and heating systems for homes and businesses

decarbonized gas network as part of a comprehensive approach is more likely to reduce greenhouse gas emissions more quickly and at less cost. This is a practical approach that gives New Yorkers choice in their heating options to reach net zero and suits the diversity of buildings in New York.

- **Leaves no customer behind**: The hybrid plan supports equitable outcomes for disadvantaged communities. By avoiding large upfront investments, this approach enables all customers to have access to clean energy.
- **Leverages existing infrastructure**: The hybrid pathway requires significantly less electric generation, transmission, and distribution infrastructure. By leveraging existing infrastructure, it reduces the siting, permitting, and construction challenges and costs of achieving net zero.
- **Enables customer use of hybrid heating systems** by supporting customer adoption of heating technologies best suited to their needs. We anticipate that by 2050, many customers will be best served by hybrid heating systems, where an electric heat pump covers cooling and heating during part of the year, and a gas system provides supplemental heat during the coldest days or months. Cold climate and geothermal heat pumps are preferrable in the northeast to maximize efficiency and minimize operational costs. Even if customers are largely reliant on electricity for space heating, they may nevertheless value the gas system as an alternative source of energy (further, hospitals and other institutions are required by law to have two sources of energy).
- **Puts the existing workforce at the heart of the clean energy transition**: The existing utility workforce is uniquely skilled to transform the gas system to deliver RNG and green hydrogen, as well as install new technologies such as networked geothermal.
- **Strengthens resiliency and reliability**: A high electrification approach puts all eggs in one basket, relying on one system for power, transport, and heating. By decarbonizing the gas system in parallel with the electric system, it creates a more diversified and resilient energy system.

through the next decade. * * * Although all scenarios involve a high degree of transformation across strategies and sectors, very high levels of transformation increase risk of delivering GHG emission reductions. Types of risk include . . . reliance on widespread adoption of technologies that are in the early stages of *deployment* (e.g., zero-emission vehicles, heat pumps) . . .") (emphasis in original).

The gas distribution system will remain essential for difficult-to-electrify sectors, many existing structures, and gas-fired electric generators located behind the city gate. The infrastructure needed to electrify 100% of all energy uses in New York (*e.g.*, heating, transportation, industrial processes) would be nearly impossible to implement, especially in the time scales needed. System capacity needed to meet peak electric load under such scenario would be extremely costly and very difficult to site and install, particularly in congested urban environments.[41] Individual and societal costs and disruption of converting all existing building stock to 100% electric energy would be extremely high and will likely impede such a conversion, and the sizeable workforce necessary to implement such a conversion does not exist today and developing such a workforce in a compressed timeframe is not likely. The *Pathways to a Carbon-Neutral NYC* study showed that 40% to 70% of the buildings in New York City would likely not be electrified in 2050.[42] Using the Integration Analysis data in the full electrification scenario, our analysis found that an incremental 63 GW of electric capacity needed to meet New York's winter peak could be avoided using a hybrid pathway. Although converting to electric heating may be viable for many customers, others will have challenges due to the upfront cost of making this switch or the difficulty of retrofitting their building. Given the physical limitations of existing buildings – it is technically difficult to electrify



[41] Many industrial processes are not amenable to electrification and use of gas for combustion is essential to their operations; and, moreover, gas-powered processes can contribute to the efficient management and reduction of greenhouse gas emissions. *See, e.g.*, 2019 Refinement to the 2006 Guidelines for National Greenhouse Gas Inventories (hereafter "2019 IPCC GHG Reporting Refinement"), vol. 3, p. 6-56; *available at*: https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/3_Volume3/19R_V3_Ch06_Electronics.pdf (noting that "combustion" is the preferred control technology for the electronics and semi-conductor industry to reduce or eliminate emissions of compounds with orders of magnitude greater global warming potential than CO_2 or methane).

[42] Pathways to a Carbon-Neutral NYC, *supra* n. 17, at 38-39.

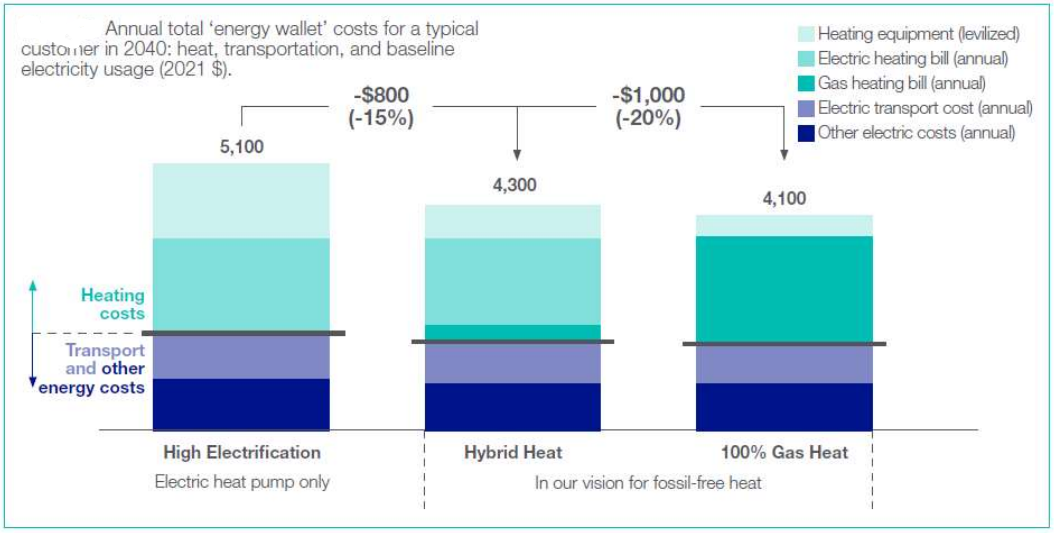
30%-70% of building space in the urban areas of New York City[43] and 5%-40% outside of the area – gaseous fuels will remain necessary for at least some users. Thus, a gas distribution system of some kind will continue to be needed and any transition plan must recognize that reality.

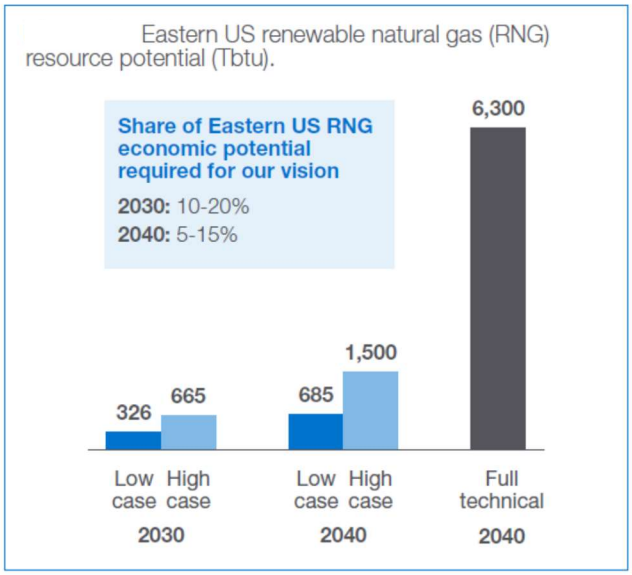
Electrification is an important component of decarbonization but it must be affordable. When considering the costs of electrification, it is important to recognize the impacts on total energy expenditures of individual customers, and the need to address long-term gas and electric network affordability. Today, fully electrifying a typical home in New York costs roughly $20,000-$60,000.[44] At the same time, gas utility rates must be designed to prevent residential and small commercial customers, particularly in low-income communities, from bearing spiraling costs as customers transition. It is likely that low-income communities and residents of older housing stock will be served by the gas networks for decades, and significant social equity concerns would result if those communities ended up bearing an increasing portion of gas system costs as wealthier communities migrate.[45] National Grid's recent analysis of Heating Decarbonization shows an $800 annual savings to residential customers with hybrid heating in 2040 (as compared to 'all electric' heating); National Grid's analysis further shows annual savings of $800-$1,000 for residential customers with decarbonized gas heating.

[43] *Id.*

[44] Upfront air-source heat pump and building retrofit costs estimated as $21,087 (Residential Single Family Basic Shell + Air Source Heat Pump) - $59,814 (Residential Single Family Deep Shell + Air Source Heat Pump), Draft Scoping Plan, Appendix G: Annex 1: Inputs and Assumptions [XLSX], at Bldg_Res Device Cost tab, February 2022, available at https://climate.ny.gov/Our-Climate-Act/Draft-Scoping- Plan.

[45] *See* Draft Scoping Plan, Appendix A, p. A-38 (noting the need to plan carefully to avoid disproportionately impacting LMI and disadvantaged community households).





In the same way we are decarbonizing the electric network through adoption of renewables, we will decarbonize the gas system with cleaner fuels, like renewable natural gas and hydrogen. Today National Grid procures ~15% of residential and commercial gas in the Eastern U.S. Achieving net zero requires obtaining 10-20% of the RNG resource potential in the Eastern US and 20% blending of hydrogen. Large accessible RNG resources are untapped and could be developed to meet the residential and commercial fossil-free heating needs not just of National Grid, but of the Northeast. The most comprehensive study to date on the availability and costs of RNG in the United States, completed by ICF for the American Gas Foundation in 2019,[46] estimated a maximum technical potential – with no economic constraints – of 6,300 TBtu in the Eastern U.S. With economic considerations taken into account, the supply potential was estimated to be between 685 – 1,500 TBtu in 2040 in US regions already connected by pipeline to the Northeast. Our fossil-free vision assumes National Grid eventually procures 10-

[46] ICF, "Renewable Sources of Natural Gas: Supply and Emission Reduction Assessment," December 2019, available at https://gasfoundation.org/2019/12/18/renewable-sources-of-natural-gas/.

20% of RNG annual supply potential in the Eastern US for customers, roughly in line with the Company's share of fossil gas purchases today in the supplying geography. Sources of RNG supply are rapidly developing and being contracted as utilities and individual customers seek fossil-free options to decarbonize heating and other uses. In the US and Canada, over 250 RNG facilities are in operation today, more than 110 are under construction and growing interest by end-users and developers indicates an accelerating pipeline of supply ahead.[47]

c. Smart Investment in Electric Networks

All paths to decarbonization rely on an electric system capable of reliably serving load, and particularly winter load as increased electrification of heating takes hold over the next several decades. Indeed, National Grid's Clean Energy Vision projects that heating load transitions from approximately 1% served by heat pumps today to 50% electric heat pumps, 25% electric heat pump/RNG hybrid systems, and 25% RNG fueled. Maintaining electric system reliability with such increased demands, as well as the demands of electrifying transport, will necessitate increased investment in electric transmission and distribution system. To this end, National Grid supports careful planning at the bulk transmission, local transmission, and distribution levels to identify infrastructure needs to interconnect increasing levels of renewable generation. The New York Power Grid Study, as well as the two bulk transmission studies completed for DPS Staff and NYSERDA, identified the extensive transmission (including projects to address system constraints) and distribution investments necessary to realize the potential of renewable generation in New York.[48] As a next step, the NYPSC (with the support and encouragement of the CAC) should expedite approvals for the "Phase 2" projects identified by utilities as necessary to unlock renewable generation.[49] Advancing these projects will ultimately

[47] National Grid's assessment of the hybrid approach is based on conservative assumptions about the cost and availability of RNG. Significantly, the hybrid approach does not assume any technology breakthroughs or cost reductions for RNG to be more affordable than full electrification pathways. In assessing RNG availability, National Grid benchmarked supply against the Low and High potential estimates (not the "Technical" potential). We further reduced the potential by including only states that are on our existing pipe network, and removing several feedstocks (energy crops, municipal solid waste). This analysis demonstrates that potential RNG supplies are more than sufficient to meet customers' energy needs in a hybrid pathway.

[48] Initial Report on the New York Power Grid Study (Jan. 19, 2021), available at: https://www.nyserda.ny.gov/About/Publications/New-York-Power-Grid-Study.

[49] Case 20-E-0197, *Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act*.

reduce the costs of renewable generation and enable the State to achieve the ambitious goals for renewable deployment.

Distributed energy resources (DERs) also can reduce the need for investment in traditional infrastructure, and increasing hosting capacity is critical to unlocking the potential of these distributed projects. Mechanisms that encourage utilities to invest in this infrastructure and fairly allocate costs and benefits, such as cost sharing, will ultimately reduce developers' interconnection costs for distributed renewables. The Final Scoping Plan should encourage cost recovery and incentives for utilities to build the infrastructure necessary for renewable distributed generation developers to connect to the electric system.

Dispatchable generation will remain key to addressing intermittency. In the near term, electric reliability will continue to depend on gas-fired generation, which will require a gas system capable of supporting that generation.[50] As the New York electric customer demand transitions to a winter peak (expected in the mid-2030s under an accelerated electrification scenario), New York will require a wide variety of generation and transmission resources to ensure reliability. Increasing access to zero-carbon electric supplies can be accomplished by increasing the amount of energy storage on the electric system; by increasing the amount of dispatchable resources available (*e.g.*, hydro generation); expanding the electric transmission system; and using existing gas transmission and distribution systems to store zero- or low-carbon fuels and/or to transport such fuels to conventional generation.

d. Transportation Sector Priorities

The transportation sector is the largest source of greenhouse gas emissions in the Northeast, accounting for over 40% of carbon emissions. Electrification of transportation is fundamental to achieving New York's decarbonization goals and meeting the needs of its residents, economy, and broader communities. This critical transition requires complementary policy and regulatory initiatives at the Federal, Regional and State levels and while New York has embarked on a path to accomplish this ambitious transition, it will require a massive increase in programs, stakeholder coordination, and investment across sectors.

[50] *See* Utility Consultation Group, *supra* n. 4.

Empowering the growth of electric vehicles (EVs) also requires an expanded, stable and reliable charging infrastructure. Today, National Grid is facilitating growth and equitable access to clean transportation choices by building a reliable network that will benefit all customers and enable an EV market that is vital to eliminating automobile emissions. Across our jurisdictions, we are installing at least 20,000 charging ports by 2025, with the potential of installing an additional 30,000 by 2025.[51] We are committed to ensuring all customers have equitable access to the benefits of clean transportation: over 50% of chargers installed in National Grid's Upstate New York service territory (for the public, workplaces, fleets, and multi-unit dwellings) are in disadvantaged communities. Additionally, the Company has allocated, $1.25 million of shareholder funds to support communities by providing the incremental cost of replacing five diesel school buses with electric, improving local air quality and providing clean transportation for children living in disadvantaged communities.

National Grid is committed to supporting the CLCPA goals and serving as a key partner in accelerating EV charging infrastructure deployment and vehicle adoption in New York. In addition to programs to support our customers, we are leading by example by electrifying our own fleet. We have committed to convert 100 percent of our light- and medium-duty vehicles and at least 30 percent of our heavy-duty trucks to electric by 2030, signing on to EV100[52] and as the first energy company to join the First Movers Coalition.[53] As part of our fleet electrification efforts, we now operate one of the world's first electric backhoes and recently had the opportunity to partner with Ford to test one of their first E-Transit vans. National Grid is also living its values by providing our employees with incentives to purchase or lease EVs.

Achieving a state-wide transition to electric vehicles on the scale and timeframe addressed in the Draft Scoping Plan will be a major undertaking. Success will require a comprehensive, long-term strategy that executes on multiple objectives at once.

First, we must coordinate our planning efforts and programs to provide rebates and incentives to enable electric vehicle adoption by consumers and businesses.

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[51] We have also proposed new programs in Massachusetts to deploy an additional 30,000 charging ports at residential, public, workplace, and fleet locations. Collectively, this will be the largest EV program in the U.S. outside of California.

[52] https://www.theclimategroup.org/ev100-members.

[53] https://www.weforum.org/press/2022/05/private-sector-sends-powerful-market-signal-to-commercialize-zero-carbon-tech-as-key-coalition-tops-50-members.

- **Ensure the state-wide Make-Ready Program is a success by offering sufficient incentives.** Additional resources are needed immediately to help support continued deployment of EV chargers in upstate New York at the pace necessary to meet New York's targets. National Grid is ready and able to accelerate deployment of EV chargers and is eager to meet future growth in EV charging demand supported by additional incentives. To achieve the State's goals for transportation electrification, New York must expand the incentives and Make-Ready programs to serve broad customer needs, including offering rebates for Level 2 charging equipment and addressing other market gaps and challenges in the Make-Ready Program.
- **Coordination, long-term planning, and sector-wide customer incentives are necessary to support the transitions to transportation electrification to meet CLCPA targets.** A holistic and comprehensive approach, which takes all communities' needs into account, is essential in enabling New York to reach its targets. In addition to the current focus on public and workplace charging, new and more expansive programs and incentives need to be established, including for commercial, residential, and fleet segments. For example, at-home make-ready incentives for New Yorkers will help to reduce the barriers many residents currently face to convenient and affordable access to charging at home.
- **Federal, state, and utility program funds should be informed by comprehensive long-term plans and be complementary to maximize impacts.** Programs must meet customers' broad needs, address the relationships between highway corridor and community-based or at-home charging, and consider all use cases and vehicle types, grid readiness, and technology choices/availability. Comprehensive planning that takes all segments within the transportation sector into account, will help ensure funds are spent wisely, opportunities are fully leveraged, and the diverse needs of all EV drivers are met. Supporting the electrification of vehicle fleets can help reduce local air pollutants within disadvantaged communities and providing community-based vehicle charging can help support residents of multifamily buildings who may not have ready access to onsite parking and personal charging stations.
- Market based carbon pricing programs also could provide a source of revenue in support of these initiatives as well as a market signal in support of lower-carbon transportation.

Second, we must ready the state's electric transmission and distribution systems to serve the new electric loads introduced by large-scale charging.

- **Highway fast-charging charging is a critical need.** Right now, "range anxiety" is a major barrier to electric vehicle adoption. Drivers must have confidence they'll be able to find consistent, reliable, and fast public charging facilities when they take longer trips or lack charging access at home or work. That will require direct-current fast-charging along major highways. Readying the grid for these fast-charging sites is imperative, as some locations could introduce more than ten megawatts of new electric demand at its peak.
- **Medium-and-heavy duty fleets are critical to meeting CLCPA goals.** Trucks and buses are only 4% of the vehicles on the road in New York, but produce nearly a quarter of GHG emissions.[54] National Grid's own case study—published in partnership with Hitachi Energy—demonstrates that large-scale fleet electrification will likely require grid upgrades, especially where fleets "cluster" in certain areas (*e.g.*, industrial centers). Fully electric fleets could increase winter load on a feeder to over 300% of its rating.[55]
- **Utilities can support the State in readying the electric transmission and distribution systems for future, large-scale charging.** Installing fast-charging ports might only take months, or even weeks; however, upgrades to the electric system can take years to properly study, design, permit, and construct. Utilities are critical partners with the State in planning proactively for future-charging needs, including "future-proofing" the electric transmission or distribution infrastructure serving these sites, so they only need to be upgraded once.

Lastly, while the Plan recognizes the need for regional, state, and federal coordination, it would be helpful to elaborate on the important role that utilities play in this transition and the critical collaboration required. More attention is needed to the explicit role of utilities in supporting the long-term planning for and deployment of infrastructure that is central to the State's goals. In addition to customer programs, utilities play a critical role in supporting state agencies in

[54] NY Department of Environmental Conservation Website, "Low and Zero Emissions Vehicles." Accessed May 31, 2022. https://www.dec.ny.gov/chemical/8575.html . *See* MJ Bradley & Associates study for similar results. https://www.ucsusa.org/sites/default/files/2021-09/ny-clean-trucks-report.pdf

[55] "The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets." National Grid and Hitachi ABB Power Grids, September 2021; *available at* https://www.nationalgridus.com/media/pdfs/microsites/ev-fleet-program/understandinggridimpactsofelectricfleets.pdf.

planning for needed transmission and distribution infrastructure to enable the transition to electric vehicles.

4. Recommendations for Improving the Draft Scoping Plan and Adopting Beneficial Policies

Achieving deep decarbonization will require every tool in the toolbox. There is great diversity among New York's communities, geographies, climates, housing stocks, and energy networks – which will frustrate any attempt to implement a "one-size-fits-all" solution. It would be premature to commit New York to a single pathway that excludes other viable, sustainable, and economic options to achieving decarbonization. New York's climate goals can be reached with a diversified approach that uses a mix of energy sources and does not impose unnecessary risks and burdens on the state's residents and businesses, and emphasizes market-based policy tools instead of mandates. A coordinated gas and electric strategy, that deploys a range of solutions and engages a broad coalition of private industry, government, labor, and – most importantly – customers, presents a better way to tackle the daunting affordability and customer adoption challenges of the clean energy transition. Using existing networks - the assets we have already built over decades - simply makes sense for New Yorkers. Our customer surveys indicate overwhelming support for solutions that leverage existing assets and preserve customer choice.

The net-zero future will necessitate significantly higher levels of electrification than we have today in tandem with continued use of the gas delivery system. Substantially electrifying transportation and buildings are key elements of a net-zero future. However, independent assessments by academics and industry experts[56] find that continued use of substantial portions of the existing gas delivery system to deliver low carbon fuels is essential to enabling a net-zero transition that accounts for the circumstances in the northeastern United States—and New York in particular. Driving increased building electrification where it can be done practically and cost-effectively and where there are gas supply constraints, and using the existing gas system to deliver low-carbon and no-carbon fuel where electrification is impractical or infeasible, is more

[56] Guidehouse, Inc., *Meeting the Challenge: Scenarios for Decarbonizing New York's Economy* (February 19, 2020), available at https://guidehouse.com/-/media/www/site/insights/energy/2021/meeting-the-challengescenarios-for-decarbonizing-n.pdf; E3 reports: *MA Future of Gas* (2022), Philadelphia Gas Works Diversification Study (2021) and New England Reliability Under Deep Decarbonization (2020); Columbia University Center on Global Energy Policy, *supra* n. 19; McKinsey & Company, *supra* n. 20

likely to achieve substantial decarbonization sooner and for less cost than any of the scenarios presented in the Draft Scoping Plan. To enable this vision and preserve the optionality for a range of potentially viable solutions, the CAC should consider the following recommendations for the Final Scoping Plan:

- **Affordability is essential to the success of the State's energy transition. New York should pursue a hybrid approach to heat decarbonization through an integrated clean gas and electric system that can more affordably and practically achieve net zero, and take other actions to mitigate cost impacts of the energy transition.** As discussed in Section 3, the gas system can be repurposed to deliver clean alternative fuels, such as renewable natural gas and hydrogen. This approach will be necessary to decarbonize hard-to-electrify industrial sectors and the electric generation sector, but aggressively pursuing this approach now provides an additional low-carbon alternative to electrification that will (i) mitigate load increases on the electric system during a time when that system will also need to accommodate widespread adoption of electric vehicles and substantial levels of building heating load, (ii) ensure that the costs to develop modern energy networks are fairly and equitably allocated among a wide base of customers, and (iii) be more cost-effective than difficult to complete full electrification, which will require not only retrofitting but also significantly increasing non-emitting electric generation capacity and electric storage.
- **The Plan also should recommend other regulatory and policy frameworks to support the long-term affordability of the clean energy transition.** Managing and fairly allocating gas network costs – particularly between present and future gas customers, a principle known as intergenerational equity – will be a critical part of ensuring an affordable transition. Any pathway to net-zero that involves reductions in annual gas demand will create challenges for utility cost recovery among electric and gas customers, though these challenges will be lower in pathways that strategically utilize the gas network in support of decarbonization. Given the importance of long-term gas network affordability, there is value in beginning to accelerate recovery of depreciation expense now to most effectively balance the traditional principles of intergenerational equity, cost causation, and avoidance of rate shock, while maintaining near-

term affordability.[57] If the collection of depreciation expenses is accelerated early and sustained over time, then even relatively modest increases in depreciation expenses recovered would allow for significant reductions in future bill impacts and in undepreciated rate base by 2050.[58] Although accelerated recovery of depreciation expenses will lead to customer bill increases in the near term, these bill impacts will be reduced if recovery of incremental depreciation expense can begin sooner rather than later. Any resulting bill increases will then be spread over a larger number of years and customers, lowering the average customer bill impact.

In addition to addressing existing gas network infrastructure costs, regulatory and policy frameworks must also consider how to equitably distribute other costs associated with the transition to net zero. For example, requiring remaining gas customers to subsidize the costs of converting other gas customers to electric heat in support of decarbonization will exacerbate inequities to remaining gas customers who are also paying for an increasing share of ongoing gas network costs. In general, costs associated with the energy transition should be borne by the broad set of beneficiaries of these policies, and not concentrated on those without the means to avoid them.

- **The CAC should support policies that will scale supply and demand for renewable fuels.** New York should drive toward net-zero gas by establishing renewable gas procurement standards that would require gas utilities to procure a growing proportion of their gas from RNG and renewable, green hydrogen over time – either by creating a Renewable Portfolio Standard (RPS) for the gas network (just like we did for the electric network) or encouraging

[57] In its most recent downstate New York gas rate cases (Case 19-G-0309/0310), National Grid evaluated shortened depreciation timelines for its leak prone pipe (LPP) assets. While there was acknowledgment among several parties of the need to consider accelerated depreciations, in the interest of prioritizing affordability during the COVID pandemic, the rate settlement provided for accelerated depreciation for the Long Island LPP assets only. The Public Service Commission recently ordered all gas utilities to submit depreciation studies by November 8, 2022 that reflect a variety of assumptions about the remaining life of the system; *see* Case 20-G-0131, Proceeding on Motion of the Commission in Regard to Gas Planning Procedures, *Order Adopting Gas System Planning Process* (issued and effective May 12, 2022).

[58] Similar analysis by various organizations, including the Environmental Defense Fund ("EDF"), Gridworks, and the Regulatory Assistance Project, has arrived at similar conclusions. EDF found that accelerated depreciation is among the preferred cost recovery tool because it brings forward recovery when appropriate and connects it to the demand of the gas system as the gas system was sized to due to certain demand. See, *Managing the Transition, Proactive Solutions for Stranded Gas Asset Risk in California*, by Environmental Defense Fund (2019).

regulators to support RNG development through greater consideration of the considerable environmental benefits. State and federal incentives should be put in place to support growing investment in production infrastructure, such as projects to capture RNG and produce green hydrogen for delivery through existing gas networks.

Low-carbon and zero-carbon fuels – alternatives to the traditional, fossil gas used today – provide an opportunity to make immediate progress toward advancing climate goals utilizing existing network infrastructure and without changes to customer-end use appliances. Incorporating even modest proportions of fuels like RNG and hydrogen can lead to significant emission reductions across our gas networks. In New York, if just 5% of existing gas sales were replaced with RNG by 2030, this would result in a 5% reduction in annual GHG emissions, equaling more than 2.2 million metric tons of CO2-equivalent reductions per year, roughly the same as the annual emissions of 480,000 light-duty vehicles.[59]

Following the successful examples of state electricity RPS, renewable gas standards should: (i) require gas utilities to procure a growing proportion of their gas from RNG and renewable, green hydrogen over time – either by creating an RPS for the gas network like was done for the electric network or evolving the way regulators evaluate gas supply plans to include consideration of environmental benefits; (ii) allow further voluntary options to provide customers seeking the opportunity to decarbonize faster to choose higher blends of renewable gas (up to 100%) much like they can choose varying percentages of renewable electricity; and (iii) complementing these portfolio standards, state and federal incentives should be put in place to support growing investment in production equipment such as equipment to capture RNG ("digesters") and to make green hydrogen ("electrolyzers"). Establishing an RNG market in New York can bring greater market resources to the agriculture, forestry and waste sectors, thereby increasing the viability of these sectors, providing greater financial certainty, and drive greater beneficial use of methane produced by these sectors to achieve CLCPA targets.[60] Other

[59] In addition to improving local air quality by eliminating flaring, RNG provides new sources for on-system supply and promotes supply diversity at time when LDCs are challenged to secure sufficient gas supplies to meet demand.

[60] The NYPSC recently stated that it would defer to the CAC on issues relating to RNG procurement. *See* Case 20-G-0131, *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures*, "Order Adopting Gas System Planning Process" (Issued May 12, 2022) ("The final recommendations from the CAC will guide how RNG will be part of the LDC's supply portfolio.")

states with emissions reduction goals have already implemented these complementary policies with considerable early success.[61]

- **New York must drive investment in energy efficiency, including weatherization, and renewable heating equipment.** There is no better tool for managing bills and lowering emissions than energy efficiency - simply enabling customers to use less energy. Energy efficiency investments provide GHG reduction immediately and are also a means of giving customers greater control over the amount of energy used, which helps to address energy affordability. The Draft Scoping Plan should recommend increased support for existing energy efficiency programs and encourage development of new program structures and innovation to address impediments that have long suppressed energy efficiency measure adoption.[62]

  Energy efficiency policies should increasingly incentivize measures that reduce both total usage as well as peak demand on the electric and gas networks. These include: Increasing energy efficiency investment and prioritizing building energy envelope improvements and adoption of heat pump technologies; funding RD&D activities that further energy network decarbonization; developing regulatory frameworks to incent alternatives to traditional network infrastructure investment; and supporting and formalizing the role of utilities in scaling geothermal investments. In particular, state energy efficiency policy should evolve to provide levels of funding and incentives commensurate with the costs and benefits of effective-useful-life ("EUL") measures (such as building weatherization).

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[61] *See, e.g.*, California Public Utilities Commission, updated Proposed Decision of Commissioner Rechtschaffen on "Decision Implementing Senate Bill 1440 Biomethane Procurement Program" Rulemaking 13-02-008 (February 18, 2022); Illinois Commerce Commission Order in "Northern Illinois Gas Company d/b/a Nicor Gas Company Proposed general increase in rates and revisions to other terms and conditions (tariffs filed January 14, 2021" docket 21- 0098 at 126 (November 18, 2021); State of Maine Public Utility Commission Docket No. 2019-00116, "Order Approving Stipulation, Summit Natural Gas of Maine, Inc. Requests for Approval of New Tariff Sheets for Voluntary Renewable Natural Gas Attribute Program" (October 28, 2019); Michigan Public Service Commission Order I "In the matter of the request of DTE Gas Company seeking authority to amend its voluntary BioGreenGas program and implement a new voluntary renewable gas program pilot" Case No. U-20839 (October 29, 2020).

[62] *E.g.*, National Grid has been working with Department of Public Service Staff and others to develop a pilot program to test energy efficiency as a resource in commercial buildings as a way to address the issue of split incentives while also attracting sufficient investment interest in deep efficiency measures. Other innovative approaches to achieving residential shell initiatives without requiring customers to outlay large sums up front also appear to show promise in New York (*see, e.g.*, Sealed (Sealed.com)).

Whenever possible, policies should support the use of networked ground-source heat pumps because they minimize peak impacts and can fully replace traditional heating more easily than air-source heat pumps. State and local building codes are essential drivers of efficient and fossil-free-ready new construction, and should prioritize highly-efficient building envelope improvements to reduce the amount of energy required to provide comfortable heat.[63] Existing utility incentives for renewable heating equipment should be expanded, supporting more customers with lower-carbon options best suited to their needs—including hybrid/dual-fuel, all-electric, and high-efficiency gas configurations.[64] Appliance standards for high-hydrogen gas blends also should be developed to leave open the potential for hydrogen to play a role in reaching net zero.

As noted in Section 2, above, State policy needs to do more to help customers overcome the barriers – financial, information, and motivational – to making the significant changes in their homes and buildings that will be required for the energy transition. Additionally, State policy plays an important role in ensuring readiness of the workforce and materials to enable building weatherization, heat pump installation, and other physical upgrades to homes, buildings and other infrastructure.

Finally, market-based carbon pricing mechanisms can provide sustained funding to support efficiency and heating incentive programs, while also providing price signals that encourage the most cost-effective GHG emissions reductions.

- **New York should continue to evolve infrastructure planning and enable utility investment in district thermal networks**. Regulatory planning processes should support long-term network strategies that promote the most efficient use of the gas and electric systems for heating, including geographically targeted fossil-free strategies (such as hydrogen clusters, thermal energy networks, or electrified neighborhoods). Gas planning practices, service regulations, and cost recovery should support both the delivery of renewable gas and the

[63] The State Legislature recently passed the Advanced Building Codes, Appliance and Equipment Efficiency Standards Act (A.10439/S.9405) to promote clean energy and implement the State's climate agenda through an advanced state energy conservation construction code and increased efficiency standards for appliances and equipment.

[64] National Grid disagrees with the DSP's recommendation to eliminate incentives for high-efficiency gas heating equipment. Eliminating incentives will frustrate one of the more effective programs for reducing carbon emission. Energy efficiency and weatherization programs should be expanded and coordinated with potential dual-heating options in hard to electrify climates.

reduction in overall gas demand over time. Sufficient regulatory funding should be provided for the research, development and demonstration (RD&D) of innovative technologies required to meet state climate targets. In addition, policy frameworks should be established to guide utility investment in renewable district thermal networks, providing an additional tool for achieving zero-fossil heat.[65] New York's utilities, the entities that built our modern energy networks, should be encouraged and incentivized to develop district thermal networks to precipitate electrification in target areas where these projects can be delivered efficiently and cost-effectively.

Regulatory planning processes should support long-term network strategies that promote the most efficient use of the gas and electric systems for heating, including geographically targeted fossil-free strategies (such as hydrogen clusters, thermal energy networks, or electrified neighborhoods).[66] Current planning processes only look out two to five years. This horizon should be expanded for gas and electric utilities. Gas planning practices, service regulations and cost recovery should support both the delivery of renewable gas and the reduction in overall gas demand over time. Sufficient regulatory funding should be provided for the RD&D of innovative technologies required to meet state climate targets.

In addition, adoption and implementation of recent legislative action to allow utility investment in renewable district thermal networks provides a significant additional tool for achieving zero-fossil heat. LDCs are best positioned to support an efficient transition to district thermal solutions given their ability to coordinate with existing infrastructure and identify opportunities for thermal networks as non-pipes alternatives. LDCs also have the customer trust and connections to promote wide-scale adoption, and the skilled workforce to deliver the network elements of district thermal – while working in partnership with developers, plumbers, and equipment manufacturers focused on the customer-side solutions. A supportive regulatory framework has the potential to incent significant investment in utility-scale thermal networks,

[65] The State Legislature recently passed the Utility Thermal Energy Network and Jobs Act (A.10439/S.9405) to promote development of thermal energy networks throughout the state and provide job opportunities to transitioning utility workers who have lost or are at risk of losing their employment.
[66] For example, the New York Public Service Commission's Docket 20-G-0131 on Gas Supply Planning and will be assessing related infrastructure and investment policies in reviewing studies of the impacts of the CLCPA for gas distribution companies.

mobilize a highly-skilled utility workforce, stimulate the installation market, and drive customer adoption in New York.

- **Ensure consistent greenhouse gas accounting methods**. Transparent and consistent greenhouse gas (GHG) emissions accounting methods are essential across all sectors of the economy, including the energy sector. To effectively tackle the challenge of *global* climate change, accounting methods should be standardized across state and federal jurisdictions, and as consistent as possible with the international standards that are framing our climate goals. New York should adopt the established and accepted accounting methodologies used by the United Nation's Intergovernmental Panel on Climate Change (IPCC).[67] Importantly, New York should ensure that emissions from RNG are properly represented as carbon-neutral when replacing the use of conventional gas by end use equipment.[68] The Draft Scoping Plan incorporates accounting methodologies that could frustrate the development of RNG solutions by failing to capture the full value of resulting carbon reductions.

  The draft scoping plan indicates that "the combustion of renewable natural gas (RNG) is likely to result in pollutant emissions similar to fossil gas combustion."[69] Indeed, New York's emission factor for RNG is based on the Environmental Protection Agency's (EPA) emission

[67] IPCC guidelines for GHG inventories reporting provide that "[i]n the Energy sector, CO_2, methane (CH_4) and nitrous oxide (N_2O) emissions from combustion of biomass or biomass-based products for energy are estimated, but the CO_2 emissions are recorded as an information item that is not included in the sectoral total emissions for the Energy sector"; 2019 IPCC GHG Reporting Refinement, vol. 1, sect. 1.1; available at: https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/1_Volume1/19R_V1_Ch01_Introduction.pdf; *see also* 2019 IPCC GHG Reporting Refinement, vol. 2, sect. 2.3.3.4, available at: https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/2_Volume2/19R_V2_2_Ch02_Stationary_Combustion.pdf ("[i]n the Energy sector, CO_2, methane (CH_4) and nitrous oxide (N_2O) emissions from combustion of biomass or biomass-based products for energy are estimated, but the CO_2 emissions are recorded as an information item that is not included in the sectoral total emissions for the Energy sector, as they are already included in AFOLU").

[68] The CLCPA approach of treating RNG the same as fossil gas is inconsistent with the IPCC and other accepted emission reporting standards. *See id*. Biomass is also treated as reducing emissions in the Regional Greenhouse Gas Initiative (RGGI), of which New York is a signatory (*see*, https://www.rggi.org/allowance-tracking/emissions). To achieve meaningful decarbonization through renewable fuels, and to enable assessment of its greenhouse gas reductions performance in the context of established and accepted standards, New York should establish GHG accounting policies that align with those of other states as well as federal and international standards.

[69] DSP at 61. This is a change from the prior June 2020 proposed accounting framework that listed RNG emissions at about zero. *See*, NYSDEC's *2021 Statewide GHG Emissions Report* at 4 ("In 2020, DEC adopted 20-year GWP values from the IPCC Fifth Assessment Report into the Part 496 regulation, which were the most up-to-date values at the time (IPCC 2013)."

factor for fossil gas of 116.6 pounds of CO2 equivalent per every MMBtu (116.6 lbs/MMBtu). This RNG accounting approach, however, fails to account for the differences in lifecycle emissions between fossil gas and RNG - and, therefore overlooks the emissions benefits of biogenic RNG.

RNG has lower carbon intensity than conventional gas because it is sourced from captured methane from animal or food waste or other biomass sources that otherwise would have entered directly into the atmosphere, and instead is combusted and converted to useful energy. Combustion of RNG from organic sources results in the release of greenhouse gases that have at least 20 times less warming potential (based on 100-year global warming potential ("GWP")) than if the methane from those organic sources had been released directly into the atmosphere.[70] In simple terms, the use of RNG represents the recycling of carbon that is already circulating in the environment, in contrast to the combustion of fossil fuel that releases new carbon emissions that were previously sequestered in the earth.[71] For this reason, RNG is considered to have net-zero emissions.[72] Therefore, RNG provides two distinct GHG emissions benefits: (1) the benefit associated with the destruction of upstream methane already in the environment that when combusted is less potent; and (2) the benefit associated with displacing conventional gas with a biogenic carbon source that is already part of the natural carbon cycle.[73] Additionally, RNG is interchangeable with gas in existing pipelines and is fully compatible with existing infrastructure.

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[70] Using a 20-year GWP, methane is over 80 times more powerful than carbon dioxide.

[71] *See IEA Bioenergy, Fossil vs biogenic CO2 emissions* ("burning fossil fuels releases carbon that has been locked up in the ground for millions of years, while burning biomass emits carbon that is part of the biogenic carbon cycle. In other words, fossil fuel use increases the total amount of carbon in the biosphere-atmosphere system while bioenergy systems operates [*sic*] *within* this system; biomass combustion simply returns to the atmosphere the carbon that was absorbed as the plants grew"), *available at*: https://www.ieabioenergy.com/iea-publications/faq/woodybiomass/biogenic-co2/.

[72] Indeed, depending on the feedstock, RNG can even have net negative contribution to GHG emissions. *See e.g.*, MJB&A, "A Framework for Gas Company Climate Planning in New York," p. 22 (indicating substantially net negative GHG emissions using Argonne National Laboratory's GREET (Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies) Model from RNG from manure, food waste, and wastewater sources); *available at*: https://www.mjbradley.com/reports/framework-gas-company-climate-planning-new-york.

[73] See, EPA 456-R-21-001, *An Overview of Renewable Natural Gas From Biogas* (January 2021) at 11 ("When fossil natural gas is replaced by RNG, the resulting GHG emission reductions provide a climate benefit. . . Fuels from some RNG feedstocks can achieve negative carbon footprints by reducing CH_4

Finding an alternate use for biogenically generated methane provides local farming communities, municipalities, and other public entities an economically viable way to reduce their greenhouse gas emissions while displacing fossil fuels, and helping the State meet its climate goals. Analysis supports the value of RNG in reducing building sector emissions. For example, MJ Bradley and Associates found that RNG used to heat a home and fuel residential appliances will provide GHG benefits compared to using electricity today and far into the future, even when the grid becomes 75% zero-emitting.[74]

Finally, standard approaches for quantifying fugitive emissions from gas distribution networks for RNG and hydrogen are needed.

- **The Final Scoping Plan should include information that allows the citizens of New York to better understand the benefits, costs, and risks of different pathways for achieving decarbonization.** First, to fully consider the relative implementation risks of different pathways, the CAC's analysis should set out the detailed assumptions underlying each pathway and provide an assessment of the ability to deliver key milestones; for example, an assessment of the customer adoption necessary to achieve the proposed nearly full electrification options.[75] Next, to guide policy makers in choosing the most cost-effective and equitable strategies, the Final Scoping Plan should include information on each pathway's financial impacts on households and business sectors over time.

- **Given the significant impact these decisions will have, the State must do more to create awareness among average customers and other stakeholders of the issues under consideration in this process**. Utilities, regulators, developers, environmental advocates, and those for whom Climate Change is a "top of mind" issue are deeply engaged in the Scoping Plan process, yet the general public is not nearly as engaged with the issues being debated, and have little to no awareness of the broad implications the Final Scoping Plan will have on their

emissions through avoiding "business-as-usual" disposal pathways, such as projects that involve AD [anerobic digestion] of manure and organic wastes.").

[74] MJ Bradley, "Renewable Natural Gas: The RNG Opportunity for Natural Gas Utilities" at 1, April 2017, https://www.mjbradley.com/sites/default/files/MJB%26A_RNG_Final.pdf.

[75] *See* Draft Scoping Plan, Appendix G, Section I, p. 9 (noting the risk that very high adoption/conversion rates present).

daily lives. The Climate Action Council should continue and expand upon its public education efforts prior to finalizing the Scoping Plan.

In summary, we must achieve a net-zero GHG emissions future to avoid the worst impacts of climate change. The transition must be across all sectors of our economy, which will require fundamental changes. We urge the Climate Action Council to prioritize affordability, recommend policies that maintain optionality for a range of potential solutions and, specifically, consider a pathway that utilizes our existing energy networks, deeply incentivize energy efficiency and weatherization, recommend the adoption of fuel standards to support fossil free gas in New York, and develop emissions accounting methodologies that align with other state, federal and international standards. National Grid is committed to working with the CAC, regulators, and other stakeholders to develop a roadmap for achieving these goals and delivering New York's clean energy future.

5. Conclusion

National Grid appreciates the CAC's efforts to develop the Draft Scoping Plan. We all agree on the goal. The reality is that there are numerous paths to get to that goal. Our joint success depends on a shared sense of responsibility and on transparency. As we continue to decarbonize, National Grid will remain honest and transparent about our progress, acknowledging when challenges or new opportunities arise. It is our sincere desire to work with elected officials, regulators, labor, customers, advocates, and other stakeholders on finding solutions that achieve our shared goals while supporting reliability and affordability.

APPENDIX A
Key Comments and Recommendations on the Draft Scoping Plan

Issue	Draft Scoping Plan	NG Comment/Recommendation
Full Assessment of Customer Affordability and Practicality	The full costs resulting from the Draft Scoping Plan's proposals are not set out at the customer level to provide a full view of the economic impacts and feasibility of proposed pathways.	The Final Scoping Plan needs to include information that would allow the citizens of New York to better understand the benefits, costs, and risk of the different pathways for achieving decarbonization. The CAC's analysis should set out the detailed assumptions underlying each pathway and provide an assessment of the ability to deliver key milestones. The Final Scoping Plan should include information on each pathway's financial impacts on households and business sectors.
Role of the Gas Network	The current gas distribution system was developed to meet current demand for conventional gas and will need to be downsized substantially as this transition proceeds. (p. 264)	The gas system can be repurposed to deliver clean alternative fuels, such as renewable natural gas (RNG) and hydrogen. An orderly transition to a low-carbon gas system will be necessary to decarbonize hard-to-electrify industrial sectors and the electric generation sector, and to provide low-carbon fuels to residential customers that continue to rely on gas for some or all of their heating needs.
Gas Connections and Appliances	No new gas service to existing buildings beginning in 2024; No gas in newly constructed buildings, beginning in 2024; No new gas appliances for home heating, cooking, water heating, clothes drying beginning in 2030. (Chapter 12 – Buildings)	A hybrid electric/gas pathway provides continued optionality for customers and achieves net zero targets without requiring rapid increases in electrification rates and customer adoption rates that are likely unachievable.
RNG & Hydrogen	Draft Scoping Plan does not include recommendations for policies to promote the development and use of RNG or hydrogen in existing gas networks.	Enable the procurement of RNG and hydrogen; allowing for longer-term contracting to support project development; establish renewable portfolio standards.
GHG Accounting	Emission accounting treats RNG the same as fossil gas, which is inconsistent with international standards. (p. 61)	Establish GHG accounting policies that aligns State with federal and international standards. Emissions from RNG are represented as carbon-neutral in the energy sector when replacing the use of conventional gas by end use equipment.
Energy Efficiency Incentives	Recommendation to eliminate incentives for high-efficiency gas heating equipment.	Eliminating incentives will frustrate one of the more effective programs for reducing carbon emissions. Energy efficiency, including weatherization programs, should be expanded and coordinated with potential dual-heating options in hard to electrify uses.

APPENDIX B
Chapter-Specific Comments on the Draft Scoping Plan

Analysis and Benefits of the Plan

National Grid provides the following comments on the Analysis and Benefits of the Plan from the Draft Scoping Plan:

- **The analysis provides a new national benchmark for incorporating just transition and in-state economic development analysis.** By integrating just transition principles from the beginning of the study, the analysis embodies the spirit of the CLCPA to achieve a fair and equitable movement from fossil-based economies. Similarly, the attention to local, regional, and statewide job creation are a benchmark for other states to follow.

- **The analysis supports a significant increase in building efficiency.** With a focus on increasing investment to "fund building efficiency and electrification in LMI homes, affordable and public housing, and disadvantaged communities," the analysis provides numerous no-regrets actions that can be taken today to ensure that our building stock is ready for a net zero world. This investment can be a solution where public institutions, utilities, and innovative private companies collaborate to invest in building efficiency *at scale*.

- **The analysis supports a Clean Fuel Standard.** Complementing its focus on electrification, the analysis presents a clear and compelling picture for fossil-free fuels in NY, ranging from biofuels to renewable natural gas to green hydrogen in NY decarbonization. The Scoping Plan states that "clean fuel standard could facilitate decarbonization of transportation fuels by requiring the providers of fossil fuels to reduce the carbon content of the fuels they provide by either blending lower carbon fuels or by acquiring credits from providers of lower carbon fuels into the stream of commerce."[76]

While we applaud the Scoping Plan for the above reasons, we highlight the following concerns:

- **Insufficient explanation of sectoral emissions reduction allocation.** The Scoping Plan assigns significantly disproportionate emissions reduction to each sector, and does not adequately explain how these allocations were decided. For example, the sectoral reduction amounts and relative rank for the "Accelerated Transition away from Combustion" scenario in the Technical Supplement[77] disproportionately allocate sectoral reductions to buildings rather than to transportation, oil and gas, and industry:

Sector	Reduction amount	Reduction Amount Rank
Electricity	-100%	1
Buildings	-96%	2
Others [IPPU, HFC]	-91%	3
Transportation	-86%	4
Oil and Gas	-77%	5
Industry	-74%	6
Agriculture and Waste	-52%	7

[76] DSP at 118

[77] Integration Analysis Technical Supplement Annex 2: Key Drivers and Outputs. IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs.xlsx

Across these sectors, only electricity has a statutory obligation (100% emissions reductions per the CLCPA). The allocation of reductions to other sectors is a modeling result. The process that resulted in absolute amounts of emissions reductions – and the rank order of sectoral burden sharing – for all sectors should be clearly explained in the Scoping Plan.

Of particular concern, buildings carry the highest emissions reduction burden in all scenarios, outside of electricity. Given the importance of buildings to all New York citizens, and the direct impact of this modeling decision on building owners, a justification should be clearly explained in the Scoping Plan.

Omission of analysis of Clean Fuel Standard for buildings and industry. The Scoping Plan analyzes and advocates for a Clean Fuel Standard for transportation but omits analysis or advocacy of the same policy for buildings or industry. This is notable since the Integration Analysis affirms that all scenarios require as much or more RNG for buildings and industry as they do renewable gasoline for transport: at minimum, 4% of pipeline gas should be RNG by 2030, though up to 9% of pipeline gas could be required in 2030.[78] This corresponds to 26-60 TBtu of RNG that needs to be procured by 2030.[79]

The findings from the integration analysis are clear: renewable fuels will be required not just in transport but also in buildings and industry. As such, policy mechanisms to drive low carbon fuel adoption should be extended to the same industries. A multi-sector Clean Fuel Standard is a no-regrets policy option for New York.

[78] DSP at 72-73.
[79] IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs.xlsx, updated Feb 24, 2022. "All Energy by Fuel" tab.

Gas System Transition

National Grid appreciates the Draft Scoping Plan's dedicated focus on long-term planning for the State's gas delivery infrastructure – a complex network of transmission, storage, and distribution pipelines that collectively supplies the single largest primary energy source in New York State (equivalent to approximately 39% of energy consumed in 2020[80]). Gas today provides essential heating energy to residential and commercial buildings across the state; high-temperature heat for manufacturing and industrial processes for some of the state's largest economic sectors; and reliable fuel for electric generating facilities that comprise the largest single source of energy generation (MWh) in the Downstate region as of 2018.[81]

Our Expectation for the Future of Gas Distribution

National Grid agrees with the large number of analyses that point to zero-carbon electric generation and electric heat pumps as a promising combination to reduce GHG emissions from building energy use over time. We are proud to be supporting the emergence of heat pump technologies through our energy efficiency programs together with NYSERDA, and we applaud New York's leadership in the development of new building decarbonization strategies to significantly reduce consumption of fossil fuels, including gas. *(We address the Draft Scoping Plan's strategies for buildings in Chapter 12 in a separate appendix.)*

The Draft Scoping Plan rightly recognizes that "the adoption of measures to transition the fossil gas system will be heavily dependent on end-use customer adoption of enhanced energy efficiency, demand response, and electrification."[82] National Grid has committed to eliminate fossil fuels from our networks by 2050 or sooner, and we expect the combination of deeper building efficiency and electrification to reduce the volumes of gas we deliver by more than half by 2050.[83] In tandem, we expect to replace fossil gas with RNG and renewable hydrogen for the full quantity of gas demanded by our customers in 2050.

In our own analysis of our Northeast operations, supported by analysis conducted by independent consultants in the Massachusetts Future of Gas investigation (DPU 20-80), we find the most affordable and resilient net-zero energy system is not one that relies exclusively or nearly-exclusively on electric energy, but rather one that continues to leverage gas infrastructure to serve customers with decarbonized gas in combination with some electrification of heating load. We expect most of today's gas customers to use heat pump technologies to *complement* rather than fully displace their use of gas.

Accordingly, in 2050, we expect to continue to serve most of the gas customers we serve today, with a corresponding physical delivery infrastructure that may be slightly smaller than today's network (by customers and extent), but that will likely not be "downsized substantially" as the Draft Scoping Plan states.[84] We do not anticipate a majority of today's gas customers to fully disconnect from the gas network going forward, nor do we agree with the Draft Scoping Plan's assertion, in a section addressing the gas industry workforce, that the "transition away from gas will likely result in consolidation and the ultimate close of fossil gas utilities."[85]

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[80] https://www.eia.gov/state/?sid=NY; New York Energy Consumption Estimates, 2020
[81] https://www.nyiso.com/-/fuel-for-the-wire-how-we-make-energy-in-new-york; 2018 Production (GWh) for Downstate Energy Zone
[82] DSP at 266.
[83] https://www.nationalgrid.com/document/146251/download; Fossil Free Plan, Figure 12
[84] DSP at 264.
[85] DSP at 268.

Policy Recommendations for Gas System Evolution

To eliminate fossil fuels from our gas network, National Grid recommends the final Scoping Plan support the evolution of gas distribution systems and service provision with two key objectives: 1) the delivery of substantially less gas (*i.e.*, half of today's volumes by 2050); and 2) the delivery of a blend of RNG and renewable hydrogen to customers. These two objectives should be pursued in combination with analysis of where it may be feasible to cost-effectively electrify all customers on a given segment of gas network.

National Grid appreciates the Draft Scoping Plan's acknowledgement of the continued necessity of leak-prone pipe replacement to ensure public safety and reduce methane emissions,[86] and point out the value of this investment for the delivery of RNG and renewable hydrogen as well. As part of our LPP replacement programs, we will continue working to analyze where certain sections of LPP replacement could potentially be avoided through electrification strategies.

We also appreciate the draft's acknowledgement of the potential for utility geothermal networks, and applaud the NY legislature's passage of the Utility Thermal Energy Network and Jobs Act. Thermal networks could become an important element of building decarbonization in the future, and could also play a role in the future evolution of gas network planning.

National Grid also agrees with the DSP's identification of potential changes to gas service requirements in statute and regulation that may be needed, including modifications to the statutory "obligation to serve" and the "100 ft rule" for socializing new connections. These changes should support both long-term planning for reducing the use of gas in New York State, and provide necessary flexibility to gas utilities and the Public Service Commission to safely and reliably serve existing customers in areas where the gas network is capacity-constrained. It will be essential for any statutory or regulatory changes be enacted in a way that ensures nondiscriminatory service for customers and does not reinforce existing inequities in customer access to affordable energy.

As portions of Chapter 18 of the Draft Scoping Plan recognize, planning for changes to gas network utilization are a complex undertaking, and National Grid recommends that the final Scoping Plan prioritize policies that significantly reduce customer gas use rather than recommending policies that seeks to achieve a predetermined outcome for gas network infrastructure. The distribution system will be needed to serve any connected customers on a given segment of infrastructure – even if a vast majority of customers on that segment were to switch their end uses from gas to electricity. In other words, any changes to the physical delivery system will always be the result of 'upstream' determinants of customer demand (driven by economics or policy), rather than a leading strategy for decarbonization. We believe it would be misdirected for the final Scoping Plan to seek reductions in GHG emissions by setting policy to reduce the extent of infrastructure (*i.e.*, removing pipe) rather than addressing the objectives of gas demand reduction and gas decarbonization.

Finally, National Grid recognizes the leadership of the Public Service Commission in the recently-established Case 22-M-0149, providing a clear path forward for gas planning in compliance with the CLCPA's requirements. This proceeding provides for the development of three complementary plans for review by the Commission: (1) a coordinated long-term gas sector decarbonization pathway analysis through 2050; (2) a coordinated near-term plan to address actions needed to achieve statewide decarbonization targets through 2030; and (3) individual, long-term utility decarbonization plans to achieve each utility's share of statewide decarbonization targets through 2050.

[86] DSP at 265.

The final Scoping Plan should recognize this proceeding and its potential to address the issues of gas system planning and evolution, including necessary updates to regulatory policies for new customer connections and gas system expansion.

Transportation

National Grid is committed to supporting State and CLCPA goals and serving as a key partner in accelerating EV charging infrastructure deployment and vehicle adoption in New York. The Company has been supporting transportation electrification for over ten years by providing guidance, incentives, and connections to our electric network for our residential and commercial customers to enable EV adoption and charger deployment and working broadly with key stakeholders to accelerate transportation electrification across communities.

The transition to electric vehicles will bring major benefits for the state, communities, drivers, and the climate. The electric transmission and distribution system can be readied to serve the needs of electric vehicle drivers, but we must accelerate our efforts to plan and implement needed upgrades to ensure a swift, equitable, and low-cost transition to EVs. Utilities must be actively engaged in this process, and National Grid is ready and willing to partner with state agencies, regulators, the transportation industry, and consumers and fleets to make this transition happen.

National Grid broadly supports the key transportation-related ambitions, needs, policies, and strategies identified in the Draft Scoping Plan and offers the following comments on key sector strategy recommendations from the sections covering "Light-Duty Zero Emission Vehicle Adoption" (T1) and "Adoption of Zero Emission Trucks, Buses, and Non-road Equipment" (T2):

- **T1**: The Draft Scoping Plan highlights the importance of investing in and removing barriers to ZEV charging and fueling infrastructure. National Grid agrees that charging infrastructure will be a, if not *the*, critical need: drivers must be able to recharge their electric vehicles conveniently, quickly, and affordably. Other key considerations and actions are necessary to support the transition.
    - Charging infrastructure estimates need to align with (and be ahead of) the updated vehicle adoption goals. To meet the Climate Act (accounting for growth) there will need to be approximately 3 million ZEV light-duty vehicles in use by 2030 and approximately 10 million ZEV light duty vehicles in use by 2050). The current programs are sized to meet the needs of 850k EVs by 2025.
    - To meet current and future market demands for EV charging, programs must meet our customers' broad needs, should address the relationships between highway corridor and community-based or at-home charging, and will need to consider all use cases and vehicle types, grid readiness, and technology choices/availability.
    - National Grid is closely looking at the needs of our customers and the gaps that currently exist outside of the NY Make Ready Program, as well as components that could be improved within the Program. Although ambitious, the PSC-ordered Make Ready Program is limited in scope and does not address the full transportation electrification needs of the State. For example, there are offerings within the Program, such as the Medium- and Heavy-Duty Pilot, where current eligibility criteria severely limit participation. As a result, National Grid has had customers who want to electrify their fleets but are unable to participate in the program.
    - The state has committed to a goal of ensuring that at least 35% of investments benefit DACs. The EV Make Ready Order only requires 20% of the budget go to DAC-eligible projects. The Program budget should be adjusted to align with the state's commitment so that utilities across the state are enabled to support their communities at this level .[87]
    - As the Make-Ready Program mid-term review (led by the Department of Public Service) will be conducted by October 2022, National Grid strongly urges the State to work closely

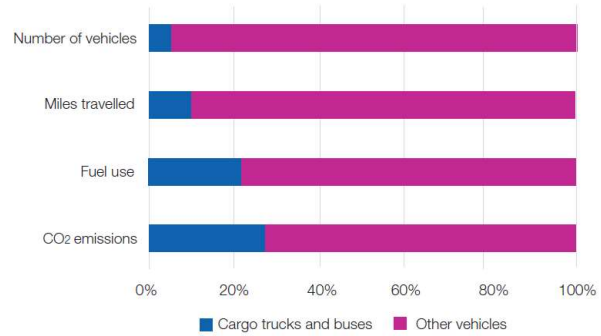
[87] https://www.nysenate.gov/legislation/laws/ENV/75-0117

with the Joint Utilities and other key stakeholders to consider ways to incorporate more flexible support for all customers and market segments, adjust program terms and conditions, and add additional programs that can better serve the transportation sector comprehensively. Specifically, additional incentives and programs are needed to support the transition for medium- and heavy-duty vehicles, fleets, and residential customers. This includes (but is not limited to) offerings such as rebates for chargers, managed charging programs, fleet advisory services, and electricity pricing programs to help reduce the impact of demand charges while utilization of chargers is still low.

National Grid urges the state to plan for the long-term needs of fast-charging along travel corridors, even today as initial deployments are made. Fast-charging along highways will introduce significant new electric load to the transmission and distribution systems. The electric grid can meet these needs, but we must start planning now – and utilities will play an important role in helping state agencies plan for this charging infrastructure. We have learned from the experience of our colleagues in the U.K., where National Grid is a critical partner for the government in deploying "Project Rapid," a 15-year plan to deploy 6,000 fast-chargers across England and Wales, which included a roughly $1.4 billion rapid charging fund to future-proof electrical infrastructure at highway sites. By right-sizing grid upgrades for the future needs of New York drivers (and leveraging electric transmission networks, which often run along highways), we can ensure that highway charging locations can scale to meet growing charging demands of not only light-duty vehicles, but medium- and heavy-duty vehicles as well (see commentary on T2 below).

- **T2**: National Grid supports the Draft Scoping Plan's focus on transitioning medium- and heavy-duty vehicles to zero emissions technologies. Although they are a small percentage of vehicles on the road, these trucks and buses account for a significant portion of miles traveled, GHG emissions, and local pollution (see figure below). Providing support to convert these fleets to ZEVs will bring substantial benefits: combatting climate change by addressing a major source of emissions, reducing harmful pollutants in impacted communities, enabling investment in local businesses, and more.

Fig 1: Cargo Trucks and Buses as a Proportion of All Vehicles and Emissions, US[88]



  - Many of these fleets—such as last-mile delivery trucks or school buses—are already initiating the conversion to electric vehicles, and many heavy-duty trucks are also ideally

[88] Nadel, Steven and Peter Huether. "Electrifying Trucks: From Delivery Vans to Buses to 18-Wheelers." American Council for an Energy-Efficient Economy. June 2021. www.aceee.org/research-report/t2102.

suited for electrification: for instance, 63% of trucking freight (by weight) travels under 100 miles each day, and 80% travels under 240 miles.[89]

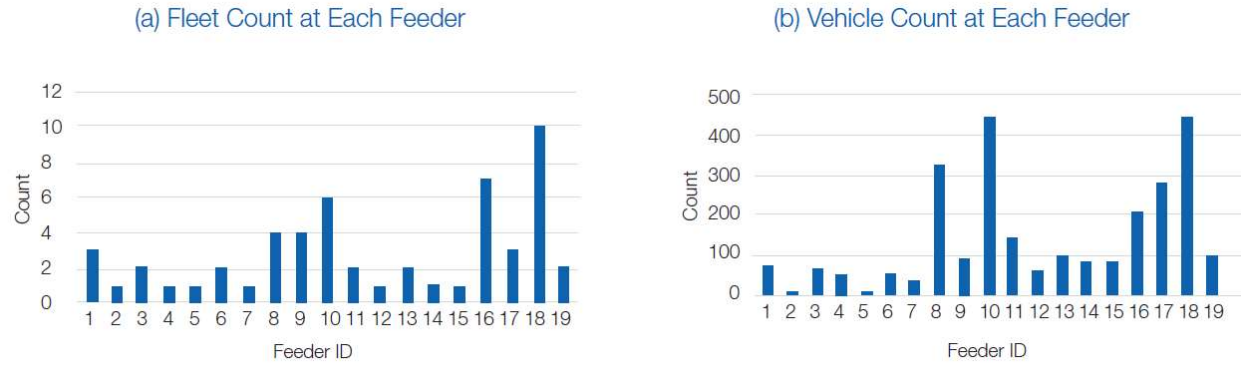
- As discussed for LDVs, National Grid agrees with the Draft Scoping Plan that investing in charging infrastructure for medium- and heavy-duty vehicles will be critical to the success of the ZEV transition. Given the current limitations within the Make Ready Program, expanded incentives and modified eligibility requirements are needed to support a broader and more diverse segment of medium and heavy-duty customers. National Grid has already run into scenarios where commercial, educational, and transit customers face limitations due to the Program design and pilot scale.
- The electric grid needs to be ready for the conversion of MHDVs to electric vehicles. Fleets introduce different types of charging load than light-duty vehicles, due to three main factors: 1) typical fleet vehicles tends to be larger than passenger vehicles, and so require more energy to fully recharge; 2) one business or transit agency can host a fleet of ten, twenty, or even hundreds of vehicles at one depot site, and require charging or fueling infrastructure for all of their vehicles; and 3) fleet depots tend to be "clustered" together, e.g. in industrial areas or near major highways, ports, or airports, which can magnify the impact to the grid.
    - Below we have included analysis from National Grid's own case study completed in partnership with Hitachi Energy, which considers the grid impacts of a 100% electrification scenario.
- Highway fast-charging will be critical to support these fleets where they need "on-route" charging. MHDVs will likely charge at much higher rates than LDVs, perhaps at a rate of up to one megawatt a vehicle, which reinforces the importance of planning proactively and "future-proofing" highway charging-sites for these large spot loads.

Further Analysis from National Grid and Hitachi Energy Joint Case Study on Fleet Electrification – "The Road to Transportation Electrification: Understanding Grid Impacts of Electric Fleets"

[89] U.S. Department of Transportation (DOT), Bureau of Transportation Statistics. "Freight Facts and Figures: Moving Goods in the United States." 2019. https://data.bts.gov/stories/s/Moving-Goods-in-the-United-States/bcyt-rqmu (accessed February 2021).

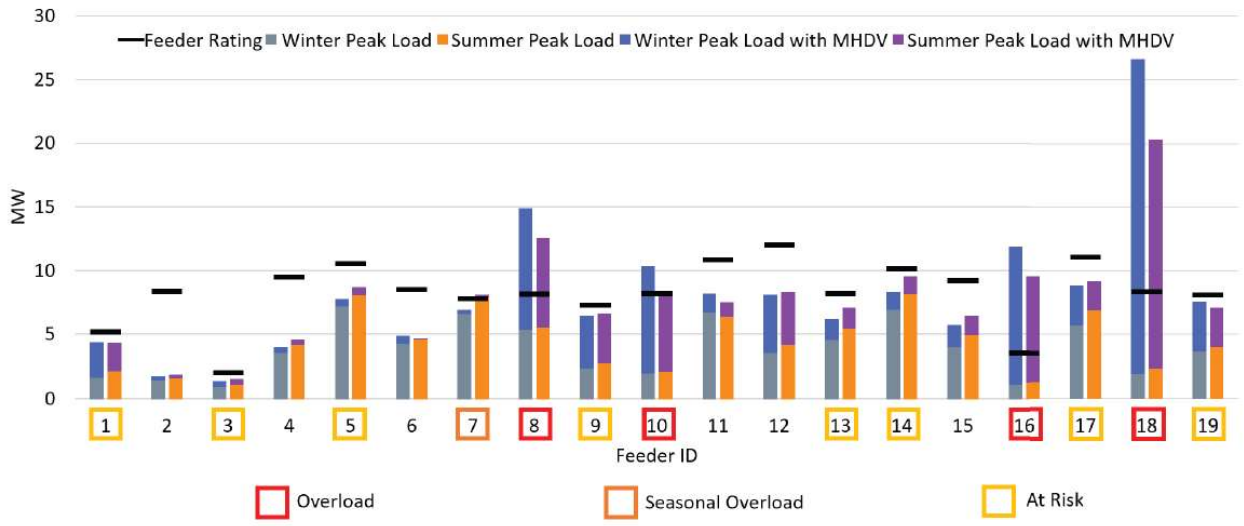
The charts below demonstrate the "clustering" tendency of fleets. National Grid and Hitachi Energy mapped 51 major fleets in a study area in National Grid's service territory to 19 distribution feeders. 5 of these feeders hosted "clusters" of 4 or more fleets, with more than 400 fleet vehicles mapped to Feeder 10 and Feeder 18.

Fig 2: Total Fleets (a) and Vehicles (b) Potentially Supported by Distribution Feeders in One Area of National Grid's System in "Full Fleet Electrification" Scenario[90]



The "clustering" tendency of fleets means that, in a future of electric MHDVs, load impacts will *not* be evenly distributed on the electric grid. Of the 19 distribution feeders mapped to a fleet in National Grid and Hitachi Energy's case study, 5 would see overloads in a scenario where 100% of fleet vehicles electrified, with a further 8 feeders at risk of overloading (e.g., from other load impacts, such as heat electrification).

Fig 3: Impact of Fleet Electrification on Associated Distribution Feeders in "Full Fleet Electrification" Scenario, During Summer and Winter Peak Load[91]

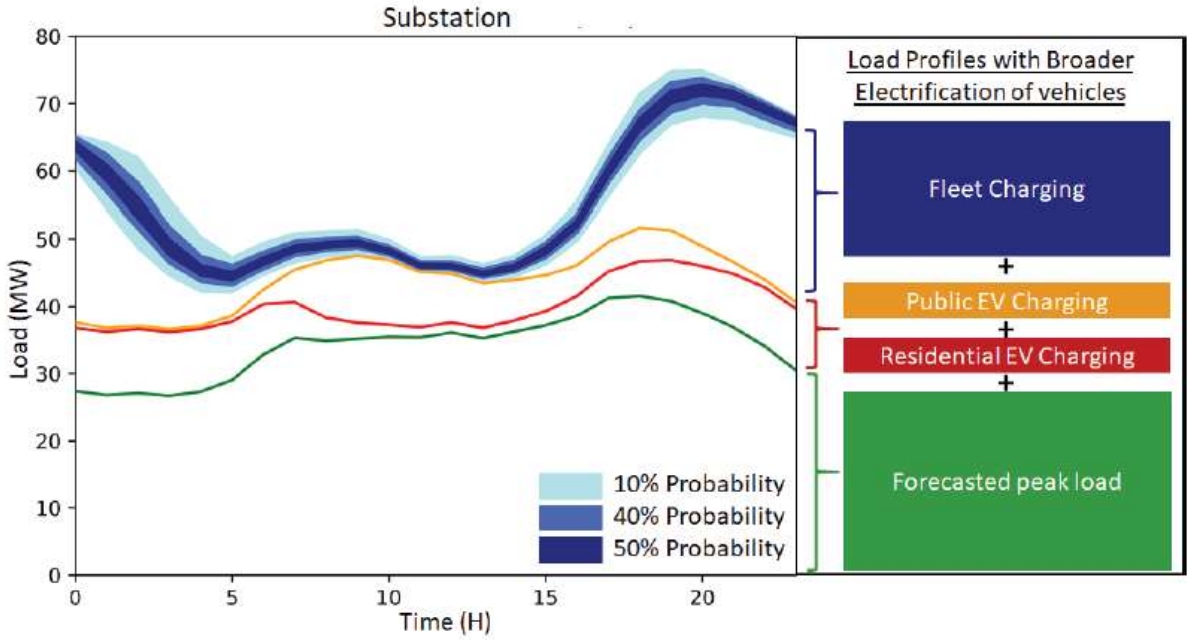


[90] "The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets." National Grid and Hitachi Energy, September 2021. Content is for informational purposes only. https://www.nationalgridus.com/media/pdfs/microsites/ev-fleet-program/understandinggridimpactsofelectricfleets.pdf

[91] *Id.*

It will be necessary to plan for fleet electrification beyond the feeder level, at the substation and the transmission system as well. The below analysis from National Grid and Hitachi Energy's case study considers the impacts of a 100% electrification scenario for not only fleets but also passenger light-duty vehicles in the study area. One substation serving fleet-heavy feeders (such as Feeder 18 above) could see a 60% increase in peak demand from fully electrified fleets, compared to a 20% increase from residential and public charging.

Fig. 4: Impact of 100% Electrification Scenario for Fleet, Residential Vehicles, and Public Charging at One Substation in Study Area (Associated with Feeders 17 and 18 Above) [92]



[92] *Id.*

Buildings

National Grid agrees with many of the strategies in Chapter 12 (Buildings) of the Draft Scoping Plan for driving investment in efficient and lower-carbon buildings. New policies and regulations to transform the level and pace of New Yorkers' investment in clean and efficient buildings are foundational to achieving climate targets, along with enabling policies that support innovation in building-related sectors. Equity and affordability are paramount when considering building decarbonization given the importance of maintaining affordable housing stock, and therefore strategies that scale up financial incentives and expanding access to public and private low-cost financing for building decarbonization are vital. Similarly, strategies that expand New York's commitment to market development, innovation, and leading by example in state projects are also favored.

National Grid, however, does not support proposed approaches that would preclude development of affordable and reliable dual-fuel heating technologies, or infrastructure that would restrict New Yorkers' choice of appliances and heating equipment in a way that would be unpopular with consumers and therefore counterproductive to efforts to decarbonize.

Prior extensive analysis of New York City building decarbonization strategies (conducted with Consolidated Edison and the NYC Mayor's Office ("NYC Analysis")) suggested a range of electrification potential substantially lower than the estimates in the draft scoping plan for 2050 (31-62% electrification in the NYC analysis, compared to 85% in the draft scoping plan).[93] Millions of buildings across New York State will be difficult to fully electrify, due to building type, age, condition and/or occupancy, and individual consumer behaviors will significantly influence the scale and pace of electrification. Heating equipment is typically replaced on an as-needed basis under significant customer time pressure, complicating the task of encouraging widespread customer adoption of different heating technologies that may require extensive and/or costly building modifications.

Given the complex challenges of building decarbonization, as well as remaining uncertainties about the cost and practicalities of strategies at scale, it is important for policymaking to retain optionality and leave open as many potential technology pathways as possible rather than prematurely discarding options to provide affordable and reliable energy and heating services. Strategies that rely on doubtful or overly optimistic levels of customer heating equipment turnover risk putting the State on a path to significantly missing GHG emissions goals. A hybrid approach to heating decarbonization strategies would be more effective at achieving such goals.

National Grid provides the following comments on key sector strategy recommendations from the draft scoping plan:

- B1: The CAC draft recommends adopting highly efficient, all electric, and resilient new construction codes. National Grid agrees that new statewide building codes should emphasize efficiency and resiliency; however, the Company recommends that the final scoping plan recognize the need for a building decarbonization policy that employs hybrid and partial electrification strategies to achieve gas demand reductions. These are a more effective way to reduce gas demand than an all-electric building code which will increase costs for customers and which contractors may not be familiar with. It will also be critical to insure the availability of a trained and skilled labor force before widespread adoption of decarbonization mandates for buildings. Building

[93] Pathways to Carbon-Neutral NYC (Apr. 2021), pp. vi and 7-8, available at https://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/Carbon-Neutral-NYC.pdf

electrification should be supported where it is now required (NYC Local Law 154, for example) and where such efforts are needed for reliability, *e.g.*, where they can contribute to relieving gas supply constraints. Targeting specific locations for full building electrification, rather than across the entire State at once, could ensure resources are used wisely and provide an important learning opportunity. Furthermore, widespread building electrification must also consider the capabilities of the local distribution system, which may not always be able to handle dramatically increased loads without upgrades.

Regarding statewide building codes, the NYS State Fire Prevention and Building Code Council should consider additional types of codes, such as an electric ready building code. Electric-ready building codes would require pre-wiring for future heat electrification to be in place at the time of construction and allow for customer choice and optionality in achieving GHG emissions reductions. Customers should have the option of choosing an all-electric building or using gas, which will be increasingly decarbonized. National Grid recommends that New York consider adopting a building code similar to the Massachusetts Department of Energy Resources (DOER) specialized opt-in code straw proposal,[94] which provides for both fossil fuel and electric heating. This allows for customer choice in how their building is heated. For residential buildings, if gas heating is used, then the building must also be pre-wired for electrification and have rooftop solar (where unshaded). If the building only has electric heating, there are no additional requirements. If it is a Passivehouse, defined as an extremely efficient building envelope (approximately a Home Energy Rating Score of 34) and improved indoor air quality with high performance ventilation, then it must be wired for electrification. In all cases, regardless of how the building is heated, at least 20% of parking spaces must be wired for electric vehicles. The 2021 International Energy Conservation Code (IECC) is another example of a building code that National Grid supports. The IECC is published every three years by the International Code Council (ICC). The IECC is a model code that regulates minimum energy conservation requirements for new buildings. The existing energy code in NY, 2020 Energy Conservation Code Construction Code of New York State (2020 ECCNYS), was based on the 2018 IECC and became effective on May 28, 2020.[95] National Grid also supports the State of New York adopting another state energy conservation code based on the 2021 IECC.

- B2: The Draft Scoping Plan recommends adopting standards for zero emission equipment and the energy performance of existing buildings, which would prohibit new gas service to existing buildings and prohibit gas/oil replacements (at end of the useful life) of heating and cooling and hot water equipment. National Grid instead recommends that the NY Public Service Commission (PSC) consider where additional gas service to existing buildings is consistent with an overall strategy to decarbonize the building sector. This could mean that buildings that are heated by heating oil or propane and are close to gas mains could be connected to the gas system, which would reduce emissions from the status quo.

- B3: Require energy benchmarking and disclosure. National Grid agrees information transparency will assist stakeholders to make informed decisions and promote improved operation.

[94] https://www.mass.gov/doc/building-energy-code-straw-proposal-updated-stretch-code-specialized-opt-in-code-feb-2022/download
[95] https://codes.iccsafe.org/content/NYSECC2020P1

- B4: Scale up public financial incentives; and B5: Expand access to public and private low-cost financing. The scale and cost of transition will require significant financial support, particularly for economically vulnerable individuals and sectors. Financial assistance directed towards energy efficiency improvements in existing structures is a reasonable use of limited public funds.[96] Low-cost financing that favors energy-saving and low carbon projects will encourage investments in these areas.

- B6: Align energy price signals with policy goals. Cost-based rates and energy pricing promote more efficient and effective use of the energy and energy networks. National Grid's pending implementation of advanced electric metering technology will enable the Company's electric operations to offer more dynamic pricing options and provide more direct market signals to customers to influence emissions-reducing behaviors.

- B7: Invest in workforce development. As the draft scoping plan recognizes "there is a shortage of qualified, skilled professionals who are ready to deliver the unprecedented speed and scale of adoption of heat pumps and energy efficiency measures that is needed over this decade to meet New York's climate goals."[97] National Grid's own experience bears out the extent of New York's labor gaps in the challenges it has experienced to rapidly engage contractors to deliver energy efficiency programs in the State. These shortages may become even more acute as the pace of the transition accelerates and the need for additional skilled workforce increases across the State and the country. The Company is working with entities such as NYSERDA on workforce development programs,[98] however, more is needed if we are to achieve the State's climate goals.

- B8: Scale up public awareness and consumer education. Public awareness and engagement are vital to success of the energy transition, particularly to the extent initiatives rely on customer behaviors and choices; however, the general public has myriad issues competing for their attention daily. Public awareness campaigns must be realistic in their potential for educating or influence behaviors, particularly in the initial stages.

- B9: Support innovation. The draft scoping plan should support innovation in all areas that can drive reductions in greenhouse gas emissions and not limit innovation support to just certain sectors or technologies. National Grid agrees with the recommendation in the draft scoping plan to support RD&D for low-carbon fuels in buildings;[99] however, that effort should not be limited solely to building "types" that the plan considers "harder-to-electrify."[100] Rather, such RD&D efforts should consider the potential use of low-carbon fuels wherever they can provide an affordable pathway to reducing greenhouse gas emissions.

- B10: Reduce embodied carbon from building construction. Reducing the amount of new construction and making optimum use of existing buildings and infrastructure will reduce the significant carbon emissions associated with the production, transport, and handling of steel, cement, glass, and other construction materials. The energy transition will require a tremendous

[96] https://www.energy.gov/eere/articles/getting-it-right-weatherization-and-energy-efficiency-are-good-investments#:~:text=The%20estimated%20cost%20of%20the,most%20regions%20of%20the%20country
[97] Draft Scoping Plan, at 140.
[98] https://www.nyserda.ny.gov/all-programs/clean-energy-workforce-development
[99] Draft Scoping Plan, at 145.
[100] *Id.*

amount of new construction, including new electric generation equipment, electric transmission and distribution facilities, millions of new electric heat pumps, other appliances, electric vehicles, etc., all of which contribute to greenhouse gas emissions in the form of embodied carbon. Effectively managing and reducing unnecessary development, construction, and production of such products will reduce embodied carbon and support the State's emissions reduction goals.

Electricity

National Grid agrees with many of the strategies in Chapter 13 (Electricity) of the Draft Scoping Plan for supporting renewable generation across all levels of the system. New policies and strategies are necessary to solve the challenge of transforming the State's electricity supply to 70% renewable by 2030 and reducing 100% of the electricity sector's greenhouse gas emissions by 2040 (in alignment with CLCPA goals). Careful coordination among energy sector actors will be necessary to test alternatives and optimize solutions. When developing policy, it will be critical to balance an 'open mind' approach that considers novel alternatives with careful consideration of all the relevant factors, especially affordability and customer reliability for New Yorkers.

Flexibility in policy will be critical to ensuring relevant parties can consider and adapt these evolving challenges as they are uncovered. Rigid frameworks will limit optionality and creativity, and ultimately lead to sub-optimal solutions. Policymakers should encourage stakeholder input, an analytical approach, and flexible frameworks to forge the optimal pathway to our goals. National Grid provides the following comments on key sector strategy recommendations from the Draft Scoping Plan:

- E1: The Draft Scoping Plan recommends a plan to retire existing fossil generation and limiting new fossil fuel generation to only the need that cannot reasonably be met by any non-generation or clean generation alternatives. Many existing fossil generation resources have critical roles in maintaining system safety and reliability. These dispatchable resources not only meet dynamic load needs, but also ensure safety and reliability by providing services that are difficult for renewable generation to replace, such as short circuit current to enable protection and system stability to maintain frequency. In developing generation retirement plans and new generation policy, utilities and NYISO must ensure the plan does not risk system reliability or safety, and a plan should not proceed without these issues adequately addressed.

- E2: The Draft Scoping Plan recommends continuing and potentially expanding existing clean energy standards funding and NYSERDA procurements of Large Scale Renewables (LSR). The plan also recommends exploring "additional areas of openness" and engaging the NYISO to improve the Class Year / Interconnection process. National Grid generally supports these recommendations, subject to maintaining customer affordability.

- E3: The Draft Scoping Plan recommends investment in tools to improve hosting capacity and accelerate interconnection of DER. National Grid agrees these goals will generally support CLCPA goals, and also notes that these challenges are largely driven by siting (*i.e.*, interconnection requirements widely vary and are highly dependent on location of the proposed DER and existing grid infrastructure). Optimally integrating DER requires the utility, when planning hosting capacity improvement, to consider DER developer needs, and the DER developer, when proposing an interconnection, to consider utility circumstances. The utility is in the best position (as the DSP) to 'guide traffic' (*i.e.*, ensure techno-economic optimal integration of DER). National Grid is active in this role, having participated in developing policy such as Cost Share 2.0, and leading development of hosting capacity maps with other New York utilities, for example. The Draft Scoping Plan correctly recognizes that utilities will need incremental engineering resources to meet these objectives. These resources will be needed not only to complete studies, but to develop automation tools, hosting capacity maps, and other tools to optimize the DER integration process. National Grid also agrees that novel tools, such as flexible interconnection, energy storage, and

smart inverters, will be instrumental. National Grid is actively piloting one or more efforts in each of these areas.

The Draft Scoping Plan encourages the State to address resistance to ground mounted solar Upstate. National Grid supports efforts to facilitate siting of renewable generating resources, but recognizes that long-term success of renewable resource development depends on the cooperation and acceptance of host communities and landowners.

- E4 & E5: The Draft Scoping Plan recommends several measures to promote community acceptance of DER and enhance customer and community choices. As stated above, community acceptance of local energy system development is essential to the long-term success of the renewable energy goals of the CLCPA. As to specific recommendations in this section of the Draft Scoping Plan, National Grid reemphasizes the need for aggressive weatherization programs to minimize the need to develop need resources in the first place. The Company also notes that microgrid investments should be carefully considered for customer value before proceeding. The Company's experience to date with microgrid proposals has revealed that achieving efficient or cost-effective reliability and resilience benefits from a microgrid solution can be difficult, and such solutions should be considered primarily in cases where alternative solutions are infeasible (technically or economically) and the potential reliability improvement is substantial.

- E6: The Draft Scoping Plan recommends looking more closely at the role of storage in meeting the accelerated 70x30 goals, and the importance of updating targets as part of the Storage Roadmap 2.0 being developed by the Department of Public Service. National Grid strongly supports the analytical approach suggested, and appreciates the critical role storage will fill in enabling an efficient clean energy transition. Not only should the roadmap redefine storage targets, but it should emphasize the role of each market actor—including the utility—in meeting that goal. Utilities can bridge gaps in the market to provide value to customers in the near term, for example in utilizing storage to improve Large Scale Renewable deliverability. The Storage Roadmap 2.0 should also be utilized to inform policy, at both the PSC and FERC / ISO level, to clear the path towards implementation. National Grid supports the recommendation in the Draft Scoping Plan to use advanced modeling to identify where storage could be utilized to enhance grid reliability and functionality, with an emphasis on the potential role for long duration storage. More robust studies should be supported at a statewide level, ideally in alignment with analytical gaps identified in the Storage Roadmap 2.0.

- E7: The Draft Scoping Plan includes several recommendations regarding transmission and distribution infrastructure to support the clean energy transition. National Grid agrees with the goal of phasing out SF_6, and has been on the path towards that goal for several years now.[101] However, the technologies to eliminate SF6 are very new, and there is not an established manufacturing infrastructure in place to support a rapid or widespread replacement of existing SF6 equipment. Moreover, because the non-SF6 equipment currently being developed is larger in size that the existing equipment, "plug-and-play" equipment replacement may not be possible in many cases, thus requiring costly and/or lengthy installation efforts. Therefore, before setting targets for SF6

[101] *See, e.g., Siemens Energy and National Grid team up to eliminate SF6 gases in cutting-edge substation upgrade, available at*: https://press.siemens-energy.com/na/en/pressrelease/siemens-energy-and-national-grid-team-eliminate-sf6-gases-cutting-edge-substation.

phase out, it is important that the Climate Action Council understand the realistic potential for such efforts and the associated costs in light of the relative priority of SF6 emission concerns.

- E8: The Draft Scoping Plan makes several recommendations around supporting markets for DER and continuing to embrace the utility's role as the Distributed System Platform provider. National Grid continues to develop its role as the Distributed System Platform provider, including developing incremental tools and expertise; however, substantial additional IT and grid modernization investments will be needed to unlock the capabilities necessary for the grid of the future. Additionally, consistent with the recommendation to develop market products to relieve renewables congestion, National Grid notes that utility-owned and operated energy storage can serve to supplement and complement the development of such market products.

- E10: The Draft Scoping Plan recommends continued investigation of new technologies and advanced fuels to enable the clean energy transition. In addition to development of other renewable resources to decarbonize the electric grid, National Grid supports consideration of low- and no-carbon gaseous fuels to support dispatchable generation as part of the energy transition. An all-of-the-above approach is needed to maintain affordability through the energy transition, and to do this, all technologies must be considered.

Waste

National Grid appreciates the Draft Scoping Plan's full lifecycle approach to reducing NY waste, especially the focus on end-of-life emissions like those from landfills and wastewater facilities. National Grid supports incentives that reduce the costs of GHG emission reduction strategies and biogas infrastructure upgrades. We look forward to working with the DEC, EFC, and NYSERDA to evaluate the potential of captured biogas and biogas flares.

New York has over 612 publicly owned Water Resource Recovery Facilities (WRRFs) serving over 1,610 municipalities; reducing emissions from these facilities will help reduce overall emissions and will have significant impacts on Disadvantaged Communities who may live near the facilities. Fourteen of these facilities are in New York City where National Grid and the NYC DEP have a strong working relationship related to biogas collection and pipeline utilization.

The Draft Scoping Plan highlights the following key points:

- Significant GHG impacts from this sector include the uncapped emissions of methane from landfills, specifically from organic materials.
- Capturing methane from waste management facilities located in Disadvantaged Communities reduces odors that significantly impact the quality of life in those communities and pose potential health impacts.

National Grid looks forward to working with the State of New York on reducing both the climate impacts and quality of life impacts brought by the emissions from waste facilities. The Draft Scoping Plan notes an eventual ban on combustion and landfilling of organics. Anerobic digesters are an environmental alternative that can reduce these emissions. These facilities can also reduce New York's reliance on fossil fuels and can lower emissions from the buildings and industries that utilize gas (by about 40% according to CLCPA accounting methodologies).

Providing a market for biogas-based products allows these facilities an economic means to reduce their emissions while also providing an alternative to fossil fuel consumption. National Grid looks forward to supporting New York State as it develops a sustainable and economic market for biogas products. Our RNG strategy, as laid out in National Grid's Fossil Free Vision, is one such market driver that will provide confidence in investments in waste emission reductions.

A means to creating a healthy market for capturing greenhouse gas emissions from WRRFs and landfills is a Renewable Heating Fuel Standard that will require sellers of gas to procure a growing proportion of their supply from qualifying fuels such as RNG from waste products. In the renewable electric sector, Renewable Portfolio Standards create a demand for electricity produced from renewable sources, which in turn increased production of wind and solar energy across the country. These have led to the costs of wind and solar dropping dramatically over just the last decade. With guidance from the State in the form of a Renewable Heating Fuel Standard, a similar result can be achieved in the heating sector as well.

National Grid provides the following comments on key waste sector strategy recommendations from the Draft Scoping Plan:

W4. WRRF Conversion

- WRRFs that emphasize the production of beneficial products is a key component to the circular economy.
- Incentivizing biogas production will reduce costly infrastructure upgrades at WRRFs.

- Some communities are well situated for co-location for strategic use of biogas.

National Grid agrees with the Draft Scoping Plan's comments on the beneficial use of biogas from WRRFs, as this process waste-stream in unavoidable. Optimizing anerobic digestion to produce valuable, market driven products like RNG has been a focus of ours. Our Newtown Creek project, coming online in 2022, is an example of a WRRF that has been upgraded to also handle organic waste. This facility is producing pipeline quality renewable natural gas.

W6. & W7 Reduce Fugitive Emissions from SWMFs and WRRFs

- Capture and beneficially reuse fugitive biogas.
- DEC, EFC, and NYSERDA should work with local utilities to evaluate the captured biogas potential uses prior to flaring excess capacity.

National Grid looks forward to further discussion with New York on how gas utilities can help with beneficial reuse of SWMF and WRRF fugitive gas emission reductions.

W9. Biogas Use

- The market, the producers and the offtakers, should be included in decisions on the best uses of biogas and bio-based products.
- The CJWG favors on-site biogas use with "no significant transmission infrastructure" allowed. They also list concerns that biogas could either intentionally or inadvertently lead to extended use of fossil fuels. National Grid is usure of the reasoning behind this and plans to have no fossil gas on out networks by 2050.
- Pipeline infrastructure, which requires no additional on-road transit, should be considered as a desirable option for biogas transportation. Road transit of biogas and biogas products would add increased traffic and increased tailpipe emissions to the communities of New York.
- The input of the CJWG throughout the report is very much appreciated and all projects need to consider their impacts on local residents.

This section highlights the need to evaluate strategies on the use of biogas. It will be vital that New York does not preemptively micromanage bio-based markets at this early stage. Draft Scoping Plan language stressed the use of fuel cells for electricity over biogas for generators or pipeline use. If the State is serious about assessing the use of the biogas, it should not pick winners and losers. It is noted that utilities can work with NYSERDA and the PSC on an analysis of waste and biogas products, and National Grid looks forward to being included in such research.

Agriculture and Forestry

National Grid agrees with many of the strategies in Chapter 15 of the Draft Scoping Plan (Agricultural and Forestry). The Agricultural and Forestry sectors offer a range of opportunities, with significant carbon sinks, great potential for the reduction of agricultural emissions, and for the future expansion of local economies. National Grid supports further development of research, technology and market solutions to help achieve these goals where the technology potential has yet to be reached.

National Grid, however, believes that agriculture methane reduction must include an emphasis on use. The Draft Scoping Plan focuses on carbon sequestration and does not sufficiently highlight the use benefit. By including the full CCUS (carbon capture, use, and sequestration) process, the agricultural sector can overcome the technical hurdles of sequestration and some economic hurdles by providing a future revenue stream to balance against equipment purchase costs. Including use as a means to reduce agriculture methane emissions also allows the biogenic methane to replace the need for fossil methane, causing a reduced demand for fossil fuels, and supporting local economies with gas production.

National Grid agrees with the Draft Scoping Plan that a Low Carbon Fuel Standard will bolster the development of the biofuel market. The Low Carbon Fuel Standard will provide greater market certainty on the long-term demands for RNG. This will help create a sustainable supply of low-carbon and zero-carbon fuels that address climate goals without requiring changes to households' heating equipment. The Low Carbon Fuel Standard would help local communities avoid methane and CO2 emissions from flared or vented waste management gas redirected to the production of RNG.

The Draft Scoping Plan identifies selected parties to collaboratively develop the pathways and standards necessary to lower emissions and build relevant markets. While National Grid agrees with the need for these collaborations, other parties need to be included. Utilities and other end buyers need to be included in the development of the biomass plan. These are the entities that will be utilizing the bioproducts and biofuels, bringing a wider variety of the supply chain into discussion on the path forward. In addition, NYSERDA's discussions with select universities on identifying efficient bioenergy pathways and to address hard to decarbonize fuel needs should be expanded to include utilities who will be critical to the industry's expansion.

National Grid provides the following comments on key sector strategy recommendations from the Draft Scoping Plan:

- AF4: The Draft Scoping Plan recommends assisting landowners in the implementation of sustainable forest management. National Grid agrees that the agriculture and forestry sectors have enormous potential to act as carbon sinks as we work to reach net zero. We appreciate that the Climate Action Council recognizes that utility companies, such as National Grid, are a land management stakeholder in New York State.

- AF9: Advance Alternative Manure Management. The Draft Scoping Plan correctly highlights the emissions concern from manure storage, stating that "Manure storages have caused the single highest increase in agricultural emissions from 1990 baseline year to today."[102] We agree with the emphasis on advancing energy production from manure waste through funding expansion, aligning, and creating marketing opportunities.

[102] DSP at 209.

National Grid disagrees that cover and flare systems are the best solution for manure management. Anaerobic digestion of livestock waste is a well-developed technology that reduces methane emissions. This use of biogas emissions to replace supplies of conventional gas should be considered as the initial and ideal option where applicable. Storage covers and flare systems should be considered as a secondary solution only where anaerobic digestion to produce biomethane does not make sense.

As noted as a potential market mechanism, we believe a Low Carbon Fuel Standard will heavily assist in growing the biofuel market. A dedicated standard for heating fuels would help offset fossil fuel use in the heating sector as biomethane can be a drop-in replacement to conventional gas.

- AF17: Bolster Local Agricultural Economies: Potential revenue sources for bolstering local agricultural economies should be expanded to include the revenues from the sale of RNG.

- AF20: Develop a Sustainable Biomass Feedstock Action Plan and Expand the Use of Bioenergy Products. The Draft Scoping Plan states that the CJWG have expressed concerns about the combustion of biomass and biofuels due to their release of emissions, and that fuel derived from biomass will likely have a limited but strategic role in New York State's 2030 and 2050 needs. National Grid calls for the definition of biofuels to be expanded from its focus from primarily wood-based feedstocks to include RNG.

  The Draft Scoping Plan states that "NYSERDA should work with Cornell CALS and SUNY ESF to identify bioenergy pathways with high lifecycle energy efficiency and high emission reductions"[103] and that the three institutions should work with the Department of Public Service to identify 2050 hard to decarbonize fuel needs and incentivize bioenergy development. Utilities should be involved in the development of these pathways and their associated standards.

- AF21: Increase Market Access for New York Low-Carbon Products. National Grid agrees that low-carbon products could be used to substitute for fossil fuel products, especially for those that are hard to electrify. We support NYSERDA providing strategic use of incentives to help low-carbon products scale up. Utilities should join DFS, NYGB and ESD in the development of a biomass development plan, including the development of standards and guidelines for low carbon products.

- AF23: Advance Bio-Based Products Research Development and Demonstration. National Grid supports developing a pilot project portfolio to drive investment in the areas of biobased low carbon fuels, including RNG.

[103] DSP at 228.

Adaptation and Resilience

National Grid agrees with many of the strategies in Chapter 21 (Adaptation and Resilience) of the Draft Scoping Plan to help New York communities prepare for and respond to the impacts of climate change. The Company's system planning practices continue to evolve and increasingly reflect the anticipated effects climate change will have. National Grid's core planning activities already consider anticipated effects of climate change to a considerable extent and reflect investment and spending priorities that enhance system resilience. For example, the Company's investment plans include significant investments in storm hardening (*e.g.*, reconductoring with tree-resistant conductors, use of Grade B construction at critical poles (*i.e.*, junction poles, switch poles and road/rail/water crossings), additional sectionalizing points (*i.e.*, reclosers, fuses and switches), enhanced lightning protection), Fault, Location, Isolation, and Service Restoration / Distribution Automation ("FLISR/DA") schemes, and substation flood mitigation investments. The Company also has implemented enhanced vegetation management practices to address impacts from more volatile storm events, as well as proactively managing infestations by invasive pests such as the emerald ash borer. The Company also is taking steps to adapt the gas system to increasing climate hazards. For example, to mitigate the impact of flooding on the gas network, we are replacing low pressure networks with high pressure to reduce water intrusion in mains and regulator stations. We also are automating valves on services in flood prone areas that will automatically shut off the gas to a building when flood waters reach certain levels and notify the Company what services have been disconnected due to flooding for follow up restoration.

Adaptation and resilience efforts are essential because climate change impacts are here and are projected to accelerate regardless of our progress on mitigation. Although National Grid agrees with many of the recommendations in Chapter 21, the Company recommends that the Climate Action Council emphasize the need for consistency and coordination among State agencies, local government, and principal stakeholders such as utilities. For example, to the extent a State agency (*e.g.*, DEC) is developing climate projections, those efforts should be consistent and coordinated with other State agencies such that competing—and perhaps conflicting—sets of climate projections are not developed. Such a situation would be wasteful, create confusion and undermine public confidence.

As noted above, National Grid agrees with the majority of recommendations in Chapter 21 and the individual elements offered to further the key sector strategies. The Company's comments below identify areas where additional clarification or modification is recommended as to the sector strategies and implementation proposals:

- **AR1: Commit to Creating, Implementing, and Updating a Comprehensive and Equitable State Climate Change Adaptation and Resilience Plan.** National Grid agrees that senior State oversight and coordination of climate resilience issues is desirable. Currently, Staff of the Department of Public Service is overseeing a climate vulnerability assessment and resilience planning process being implemented by the State's major investor-owned electric utilities in response to legislation enacted earlier this year (PSL § 66(29)). NYSERDA in working with Columbia University to develop climate projection data to inform the utilities' vulnerability assessments and resultant resiliency plans. Staff from the agencies have been coordinating with one another and the utilities to ensure the climate projection data used by the utilities is consistent and appropriate for the need. Senior level State oversight could help work towards ensuring that climate projection information is readily available and accessible to entities across the State (e.g., county governments, local municipalities and communities, businesses, and individual citizens) to aid their adaptation planning.

- **AR2: Incorporate Equitable Adaptation and Risk-Reduction Considerations into Relevant State Funding and Regulatory Programs, Projects, and Policies.** The Company agrees with the components of this sector strategy but reiterates its recommendation that release of guidance or information on projected climate projections or climatic changes be consistent and that there not be competing State sources of potentially conflicting information.

- **AR8: Develop Policies and Programs to Reduce Human Risks Associated with New Patterns of Thermal Extremes**. Because the need for warming or cooling centers can be exacerbated by major storms that interrupt utility service, the Company recommends that efforts in this sector be coordinated with the utilities, local emergency operations centers, and the Department of Public Service.

- **AR9: Ensure the Reliability, Resilience, and Safety of the Energy System.** Ensuring the safety and reliability of the energy system is foundational to the success of the energy transition. Without a reliable energy network, the goals of the CLCPA cannot be fully achieved. The State's major investor-owned electric utilities are developing climate change vulnerability studies and resilience plans as required under recently enacted legislation and will be filing those studies and plans in 2023. Currently, municipal and other non-jurisdictional entities are not subject to the requirements of the legislation (PSL § 66(29)). The CAC should consider whether all utilities in the State should undertake such assessments and develop corresponding resiliency plans. Additionally, the process to develop strategies for grid outages and extreme weather events must include utilities as well as the NYISO.