



April 8, 2022

Via email: board.secretary@bpu.nj.gov

Carmen Diaz, Acting Secretary of the Board
44 South Clinton Avenue, 1st Floor
Post Office Box 350
Trenton, NJ 08625-0350

Re: In the Matter of the Ratepayer Impact Study ('Study') of the New Jersey Energy Master Plan
BPU Docket Number EO22030130

Dear Secretary of the Board:

New Jersey Natural Gas Company ("NJNG"), , South Jersey Gas Company ("SJG") and Elizabethtown Gas Company ("ETG") ("the Distribution Companies") submit these joint comments in BPU Docket Number EO22030130 for the New Jersey Board of Public Utilities' ("BPU" or "Board") consideration.

The Distribution companies serve nearly 875,000 residential and commercial customers in the State of New Jersey, who depend on us to provide energy for building space heat, hot water and cooking needs.

Today, over 75% of New Jersey homeowners, or nearly 3 million customers, choose our infrastructure as the primary way to heat their homes, reflecting the affordability, reliability, flexibility, ease of access and environmental benefits of gas relative to other energy alternatives.

Our infrastructure is designed with sufficient capacity to reliably meet consumer needs in the building sector on the coldest days of the year, and also used to provide energy to support industrial manufacturing processes, central station and distributed backup power generation, and vehicle transportation.

Statewide, there has been an estimated \$17 billion invested in assets to serve customers, maintaining an underground network with over 35,000 miles of service mains, comprising more miles per square foot than any other State in the US.

The Distribution Companies are fully committed to supporting the State in its efforts to reach its decarbonization goals and have adopted aggressive emissions reductions targets which are already driving results. In partnership with the BPU, we have invested in our systems infrastructure to improve safety and reduce leaks. We have managed successful energy efficiency programs to reduce gas consumption and energy costs for customers. Both of our parent companies have invested aggressively in New Jersey solar projects. We are innovating to develop and deliver new carbon neutral fuels like Renewable Natural Gas (“RNG”) and zero emissions hydrogen produced from renewable energy.

As we look to the future, our infrastructure will be essential to achieving our State’s emission reduction goals, and ensuring that we satisfy the unwavering needs of our society for energy reliability, affordability and security.

Over time, it is expected that traditional natural gas use will be reduced by energy efficiency, displaced by carbon-neutral clean fuels like green hydrogen and RNG, and offset with emerging technologies like carbon capture and storage.

In contrast to full electrification as reflected in the State’s current “Least Cost” scenario, a clean fuels approach to decarbonization can avoid the need for major building and electrical system infrastructure costs, diversify the risks of reliance solely on the electric system, and support least-cost carbon abatement solutions in hard to electrify sectors like heavy duty transportation, long duration power storage, and industrial manufacturing.

Moreover, leveraging existing pipeline infrastructure for the storage, transportation and delivery of clean, gaseous fuels complements and does not compete with the State’s plans to decarbonize electric generation through a dramatic increase in wind and solar. Leveraging green hydrogen production to capture excess renewable generation (that would otherwise be curtailed at times when supply doesn’t match demand) and store it in existing pipelines will provide a flexible storage opportunity in the future.

With the trust of our customers, strong supply chain relationships, operational experience, and with ongoing partnership with regulators, our Companies can play an enabling role in delivering emissions reductions better, faster, cheaper than is possible with a full electrification approach.

We appreciate the opportunity to offer the following recommendations on the Ratepayer Impact Study:

1) The State should consider multiple planning scenarios to achieve decarbonization, not just the “Least Cost Scenario” (Full Electrification)

Multiple scenarios are consistent with an **ALL OF THE ABOVE APPROACH** to achieve the Energy Master Plan (“EMP”) goals, with appropriate focus on decarbonization outcomes and not specific technologies.

The Ratepayer Impact Study focuses exclusively on the “Least Cost” Scenario (Full Electrification) from the 2019 EMP, and also an Ambitious Pathway Scenario which accelerates goal achievement from 2050.

The “Least Cost” scenario is a “full electrification, high renewable scenario.” This scenario was developed in 2019 and should be re-analyzed with the latest inputs and assumptions. An Ambitious Pathway scenario should be informed by a comprehensive evaluation of actual performance against EMP goals to understand what is and what is not working and to adapt policy accordingly.

The timing to evaluate EMP and reconsider the planning scenarios is appropriate given that New Jersey is approaching the three-year anniversary of the Energy Master Plan, and there is a statutory requirement to update the EMP every three years. This update process should be rigorous, providing an opportunity to adapt policy based on real-world experience, key metrics on how clean energy programs are performing, and updates on emerging technology, policy changes, and market feedback.

The emergence of hydrogen provides a clear example of the need for flexible, open, technology-neutral policy approach to decarbonization. When the EMP was issued in January 2019, hydrogen was an emerging, but nascent topic in much of the clean energy conversation. The “Retain Gas” scenario originally evaluated in the 2019 EMP, did not include hydrogen.

Today, hydrogen is recognized for its potential transformational role as a clean molecule to provide least cost pathways to decarbonize the heavy transportation, power, industrial and building sectors. Since the 2019 EMP:

- 29 countries around the world have adopted hydrogen strategies, with a goal of deploying 70 gigawatts (“GW”) of green hydrogen production by 2030 (up from 300 megawatts in 2021), and with more than \$100 billion in global budget commitments
- The U.S has approved \$9.5 billion to support hydrogen development—including the establishment of four regional hydrogen hubs—more funding than provided for any other green technology in the recently passed infrastructure bill. New Jersey announced on March 24, 2022, that it is joining with New York, Connecticut and Massachusetts to develop a proposal to become one of these four regional hydrogen hubs, with Governor Murphy recognizing the important role that clean hydrogen can play in New Jersey’s clean energy future:

“Clean hydrogen has the promise to expand New Jersey’s diverse clean energy portfolio. Clean hydrogen technology has the potential to improve net greenhouse gas emissions and harmful air pollutant impacts. Joining together with our regional partners will allow us to build a strong coalition for the development of clean hydrogen technology and cultivate economic growth and opportunity for New Jersey. “

- Progress on policy and technology has unleashed a wave of investment, innovation, research and development around the world in an effort to find new ways to transport, store, deliver and use hydrogen.
 - Over 300 major hydrogen project announcements have been announced globally
 - 26 U.S.-based distribution companies are involved in hydrogen blending demonstration projects
 - An industry consortium is working with the National Renewable Energy Laboratory to assess the impact of hydrogen blends on the pipeline system and its materials to develop hydrogen blending standards
 - As part of their roadmap to convert their natural gas system to 100% hydrogen, the UK gas distribution utility Cadent has determined that there is no adverse impact to existing gas infrastructure and heating appliances at up to 28% hydrogen blending.

Similarly, RNG received negligible consideration in the 2019 EMP. However, as technology has evolved, RNG has emerged as a game-changer for utilities because it reduces the impacts of organic wastes, while also serving as a high-impact fuel. A blend of natural gas and RNG can result in a pipeline supply aligned with emissions targets, while maintaining the reliability and affordability of the overall system. It is possible to achieve a carbon-neutral pipeline supply in a cost-effective manner without removing natural gas from the system.

2)Reflecting advances in hydrogen, RNG, and carbon capture, the Study should develop and incorporate a new clean fuels scenario which leverages existing gas infrastructure through blending clean molecules of the future

Numerous independent studies and publications including those from Columbia University, McKinsey and Bloomberg – speak to the value of leveraging existing gas infrastructure in the energy transition.

The McKinsey and Co. report issued in March 2022 “Decarbonizing Gas Utilities: The Potential Roles of a Clean Fuels System in the Energy Transition,” indicates that in cold climate regions (like NJ), the cost of a building decarbonization strategy which includes clean fuels, **can result in 75% lower cost than a strategy which relies on full electrification alone.**

The Companies agree this cost estimate is indicative of the magnitude of the cost saving potential in New Jersey. Over the past several years, we have conducted significant research and analysis to evaluate alternative decarbonization scenarios for natural gas use in buildings, including the supply potential and costs associated with carbon neutral pathway, and the costs relative to full electrification.

We would welcome the opportunity to collaborate with policymakers, the modeling team, and other stakeholders to define a clean fuels scenario.

3)The Study should provide additional detail and transparency into inputs and assumptions in the EMP 2019 “Least Cost” (Full Electrification) scenario in order to more precisely understand the incremental costs of building electrification on the total costs of the Energy Master Plan.

The costs of customer conversions from gas to electric heat could be significant and must be understood.

- Beyond the assumption that gas use in aggregate declines by 2.4% annually due to electrification it is not clear from the March 25, 2022, Brattle Group presentation what specific assumptions the modeling team is making about annual customer conversions.
- The customer economics of heat pumps and their performance in colder climates must be considered and reflect the significant difference between New Jersey’s retail gas and electric rates, as well as the higher capital costs to install heat pumps for homes in New Jersey with its older building stock and where the majority of homes may not have existing heating systems easily compatible with electric heat pumps.
- The gap needed to make heat pumps economic for customers must be reflected as the incentive the State will need to pay to encourage customer adoption and, therefore, be included as a clean energy program cost and with an associated rate impact. *(The estimated costs cited below may be conservative given recent inflationary pressures.)*

- For example, in their November 2021 analysis “Assessing the cost-effectiveness of residential heat pumps for building space heat decarbonization in North America”, IHS Markit concluded that in cold climates (like New Jersey) customers would need a \$6,000 to \$10,000 incentive to make electric heat pumps economic with natural gas heat.
- If the assumption is that 90% of New Jersey gas customers will convert to heat pumps by 2050, this would require nearly 3 million customer conversions. At a \$6,000-\$10,000 incentive range, the total program cost would be **\$18 to \$30 billion**. A similar incentive needs analysis and cost impact must be conducted for commercial customers as well.

The cost impacts of high building electrification on the electric system also requires further update, analysis and clarification reflecting current cost pressures .

- The EMP modeling assumes electric generation capacity will increase from 20 GW in 2020 to 70 GW in 2050 which includes 53 GW of renewables. We assume most of this capacity increase is attributable to building electrification, but this should be confirmed.
- The costs imposed by building electrification on these incremental capacity additions should be transparent. If, for example, the average cost between 2022 and 2050 is \$2 per watt, the total investment to add 50 GW could be over **\$100 billion** or \$30,000 per household in the State.
- That **\$100 billion** still only addresses power generation. We have seen limited information on the transmission and distribution impacts of this high electrification case, which independent studies have estimated to be as high as **\$80 billion** in a high renewable, full electrification case.
 - On page 3 of the Stakeholder Meeting Notice of March 11, 2022, in this proceeding, “Costs in Scope” include transmission and distribution costs, however, we did not see any reference of these costs in the March 25, 2022 stakeholder presentation. These are necessary costs of a full electrification pathway and must be accounted for.
 - Further analysis is also needed to understand the reliability of this 70 GW of 2050 electric capacity will be sufficient to meet electric demands for peak winter periods.

- Winter design conditions must reflect periods of consecutive cold days, and extended periods with limited sun and wind as derived from actual weather data. Based on our internal analysis using weather data from the polar vortex of 2017-18 with 15 consecutive days of subfreezing temperatures, we calculate that the State would be 20% short of power demand with the 2050 EMP generation contemplated. It is therefore possible that the electric system costs contemplated in the EMP may be significantly understated.

The need for increased transparency on costs of building electrification is not aligned with two specific modeling approaches we heard at the March 25, 2022, stakeholder meeting:

1) The Study will only model costs to 2030. To get a comprehensive assessment of the costs of building decarbonization, the Study should look at costs to 2050, consistent with the EMP cost analysis. A 2030 perspective will significantly understate the costs of full building electrification, particularly where costs of building a winter peaking utility will likely be incurred in the 2035-50 period.

2) The Study does not calculate utility revenue requirements based on costs, but rather applies an overall 1% growth rate to utility revenue requirements.

We do not believe this approach will provide an accurate linkage between total costs, rates, and bill impacts. Building electrification may impose hundreds of billions of dollars of costs on electric customers. Once total conversion and electric system costs are quantified, these must be directly translated to revenue requirements in order to get a complete and accurate ratepayer impact assessment.

Thank you again for giving us the opportunity to share our views. We look forward to working with policymakers and stakeholders on this effort.

Respectfully submitted,

NEW JERSEY NATURAL GAS COMPANY



Andrew K. Dembia
Regulatory Affairs Counsel

SOUTH JERSEY GAS / ELIZABETHTOWN GAS COMPANY



Deborah M. Franco VP –
Rates, Regulatory & Sustainability