



Affordable Energy for New Jersey

Comments to the New Jersey Board of Public Utilities on the Future of Natural Gas

September 6, 2023

The BPU's recent public workshops about the future of natural gas in New Jersey were a farce. They were an exercise in denying economic and physical reality in favor of a mythical energy nirvana. The BPU appears to believe that natural gas consumption in the state can be eliminated and replaced with a mixture of "green" hydrogen and electricity from wind and solar generators. Basic economics and physical reality suggest otherwise.

The recent financial revelation by Ørsted, for example, which is developing the Ocean Wind project, that building Ocean Wind will require even more taxpayer subsidies and higher contract prices, even after the legislature voted to hand over as much as \$2 billion of ratepayer money to the company, is but one small demonstration of this energy reality. Replacing natural gas use in the state by retrofitting residential and commercial buildings, and replacing electricity generated with natural gas with electricity from wind and solar power, is another.

Natural gas is a crucial component of New Jersey's energy supply. Not only is natural gas used to generate more than half of the state's electricity supplies, but over 75% of all households use natural gas for space and water heating, as do many businesses. Virtually all commercial restaurants rely on natural gas. Moreover, natural gas generates over 40% of the electricity in PJM, which supplies the electricity used by New Jerseyans.

Despite its obvious importance, EMP calls for eliminating natural gas from New Jersey's energy mix, not only by shuttering clean, low-cost generating plants, but also by forcing everyone to tear out their natural gas furnaces, water heaters, and appliances, and replace them with electric ones – along with electric cars – all powered with electricity generated from wind and solar. The costs will be staggering – AENJ estimates it will cost *billions* of dollars every year to retrofit thousands of homes and businesses, higher electricity prices that customers will be forced to pay, and less energy security. These higher costs will reduce economic growth and result in lost jobs. Of course, in the four years since the release of the EMP, the BPU has never provided any actual estimates of the costs to eliminate natural gas or implement any other aspects of the EMP.

Consider the EMP's building electrification plans, which call for the building sector to be fully decarbonized by 2050. The EMP recognizes that "Decarbonizing the building sector will be a substantial undertaking because New Jersey is already highly developed, and the transition to electrification will depend on technologies that are still maturing." In other words, New Jersey consumers are going to pay – and pay heavily – as they are forced to replace natural gas with electricity.

Replacing natural gas furnaces and water heaters with electric heat pumps, as the EMP envisions, will cost billions, both to retrofit existing homes, apartments, and businesses, and for the electricity those heat pumps will use. A study prepared by Diversified Energy Specialists examined actual heat pump conversion costs for over 600 homes in Massachusetts over the five-year period 2014-2019. That study found the average cost to convert a home was almost \$23,000 for a typical home of 1,500 square feet.¹ Diversified Energy Specialists also evaluated actual heat pump retrofit costs for the New York State Energy Research and Development Agency, again finding the costs averaged between \$10,000 and \$30,000, depending on home size.² Of course, that was before supply chain issues and galloping inflation. Coupled with the increased demand for heat pumps, the retrofit cost surely will be much higher.

There are about two million homes in New Jersey that are heated with natural gas, propane, or heating oil. Retrofitting all of those homes likely will cost at least \$50 billion. Then there is the cost of retrofitting apartment buildings. Based on a 2019 study prepared for the Natural Resources Defense Council, the average cost for retrofitting apartment buildings will be around \$10 per square foot.³ Accounting for inflation, an average apartment size of 1,000 square feet, and 1.3 million multifamily units in the state, the costs are likely to be \$20 billion. Thus, the total cost to replace fossil fuel heating in single-family homes and apartments is likely to be \$80 billion.

Replacing gas water heaters would add \$5 billion or more in costs, based on the average cost of heat-pump hot water heaters⁴ and the fact that 80% of New Jersey homes have gas water heaters.⁵ Finally, because much of the residential building stock consists of homes that are more than 40 years old, extensive upgrades to home electrical panels and wiring would have to be made, adding even more to the overall costs.

¹ Diversified Energy Specialists, "Case Study: Massachusetts Air-Source Heat Pump Installations, 2014-2019," Report prepared for National Oil Heat Institute, November 19, 2019, Available at: <https://www.senatenj.com/uploads/DES-Heat-Pump-Study-NORA.pdf>

² Diversified Energy Specialists, "Case Study: New York Air-Source Heat Pump Installations 2017-2019," Report prepared for the New York Climate Council, June 30, 2022. Available at: <file:///C:/Users/jless/Downloads/DES-NYSERDA-Heat-Pump-Study-for-NY-Climate-Action-Council.pdf>

³ Steven Winter Associates, Inc., "Heat Pump Retrofit Strategies for Multifamily Buildings," Report prepared for NRDC, April 2019, p. 17. Available at: <https://www.nrdc.org/sites/default/files/heat-pump-retrofit-strategies-report-05082019.pdf>

⁴ Source: <https://www.remodelingexpense.com/costs/cost-of-heat-pump-water-heaters/>

⁵ Source: U.S. Census Bureau.

These cost estimates do not account for the additional cost of high-priced electricity, such as for offshore wind. Forcing consumers and businesses to spend billions to replace natural gas space and water heating with electric heat pumps, and then forcing them to purchase ever more costly electricity, will inflict huge damages on the state's economy, causing the loss of thousands of jobs – far more than will ever be created by subsidizing construction of wind and solar generation.

The BPU wonders whether the existing natural gas infrastructure in the state can be “repurposed” to carry non-carbon alternatives, including renewable natural gas (RNG) and “green” hydrogen manufactured using electrolysis and “surplus” wind and solar energy. Although RNG could substitute for a small percentage of existing natural gas consumption, RNG is not cost-competitive with traditional natural gas supplies. As for repurposing the existing pipeline infrastructure to transport green hydrogen, that is physically impossible because (i) hydrogen corrodes steel and (ii) hydrogen would leak out of existing pipelines. Hence, an entirely new hydrogen transportation and storage infrastructure would need to be built.

Furthermore, producing hydrogen through electrolysis is not cost-effective, as it is far more expensive than the current process that uses natural gas. In addition, there are no commercial-scale hydrogen electrolysis facilities in existence. Moreover, “surplus” wind and solar energy to provide the electricity for such facilities does not exist and the cost to construct enough wind and solar generation capacity so that there is sufficient surplus to produce green hydrogen will be cost-prohibitive. In other words, the BPU is peddling yet another green fantasy.

In addition to the staggering costs of replacing natural gas in the state, there is the fantasy that doing so will address climate change by reducing greenhouse gas emissions. The state's GHG inventory estimates that total GHG emissions in 2020 were around 91 million metric tons, of which about 23 million metric tons were associated with residential and commercial fossil fuel consumption, and about 8 million metric tons was associated with natural gas transmission and distribution.⁶ By comparison, world carbon dioxide emissions were about 35 billion metric tons in 2022.⁷ Hence, electrifying all New Jersey homes and businesses by 2050, plus eliminating all natural gas infrastructure-related emissions, would displace less than eight hours of world emissions. Clearly, this would have no measurable impact on world climate.

This raises an obvious question, which the BPU has never answered: Why does the state insist on pursuing the elimination of natural gas consumption (as well as electrifying transportation), when doing so will have no impact on world climate, but will have a severe and adverse impact on the state's economy?

⁶ New Jersey Greenhouse Gas Inventory, 2022 Mid-cycle Update Report, December 2022, p. 4. Available at: https://dep.nj.gov/wp-content/uploads/ghg/2022-ghg-inventory-mcu_final.pdf

⁷ Energy Institute, 2023 Statistical Review of World Energy, p. 12. Available at: <https://www.energyinst.org/statistical-review>