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May 01, 2025

Sherri L. Golden Board Secretary New Jersey Board of Public Utilities 44 South Clinton Avenue, 1st Floor P. O. Box 350 Trenton, NJ 08625-0350

Re: GeoExchange Comments In the Matter of New Jersey's Energy Master Plan (Docket No. Q024020126)

Dear Secretary Golden:

Thank you for the opportunity to provide additional comments to the New Jersey Board of Public Utilities (BPU) regarding the New Jersey Clean Energy Master Plan (EMP), pursuant to the BPU notice issued March 03, 2025 (revised March 13, 2025). The Geothermal Exchange Organization (GeoExchange) supports the EMP effort as an important step to unify clean energy policy across the state, and encourages the BPU to continue to support the deployment of geothermal heat pumps to achieve the policy goals of the EMP.

GeoExchange is a nonprofit trade association promoting the manufacture, design and installation of geothermal heating and cooling technology, also known as ground source heat pumps. Our members include manufacturers, installers, technology providers, utilities, and others in New Jersey and across the country. Geothermal heat pumps (GHPs) are one of the most efficient heating and cooling systems available and can significantly reduce greenhouse gas emissions and energy bills for businesses, nonprofits, and residents across the state.

GeoExchange provided initial comments on the EMP in June of last year; this letter provides updates based upon the latest EMP modeling shared by BPU and other policy developments in the state and at the federal level.¹

¹ See comments from GeoExchange dated June 12, 2024.

The EMP Modeling Should Increase Projections for GHP Deployment

During the Energy Master Plan Draft presentation held on March 13, 2025, Energy and Environmental Economics (E3) presented various modeling scenarios for how the state can reach its policy goals. Under all scenarios, E3 modeled GHPs to represent between 1-2% of the HVAC market in 2050.² This modeling underestimates the market potential of GHPs in the state; E3 should update their models to account for a higher GHP market share. Geothermal heat pumps should play a key role in New Jersey's transition to an electrified building sector, and the state should plan to grow GHP market share to 20-25% of all heating and cooling systems by 2030 to optimize grid benefits and reduce long-term costs for New Jersey residents and businesses.

While GHPs have historically represented a small share (less than 1%) of the HVAC market, new, robust incentives have been made available for GHPs in New Jersey. Under the decarbonization portfolios of the recently launched Triennium 2 energy efficiency plans, the state's major electric investor-owned utilities will be offering up to \$5,000 *per ton* for residential customers and up to \$6,500 *per ton* for commercial customers who install geothermal systems. These incentives represent significant increases from previous offerings, and have the potential to accelerate the industry and drastically increase the number of New Jersey commercial and residential buildings served by GHPs.

- The U.S. DOE's *Pathways to Commercial Liftoff: Geothermal Heating and Cooling* report estimates that a \$9,000 incentive will increase the anticipated residential GHP installations threefold from the base scenario.³
- Other states have used significantly higher GHP deployment rates in their modeling. Modeling for the New York Climate Action Council Scoping Plan modeled GHP representing 22-23% of all residential and commercial heating and cooling by 2030 to efficiently meet the Scoping Plan goals.⁴ A study by the Brattle Group modeled 33% GHP adoption as part of their optimized "mixed scenario" for building decarbonization in Rhode Island.⁵

By not assessing the potential scenarios of large-scale deployment of GHPs, New Jersey risks blind spots regarding important policy actions and missing out on the significant benefits to buildings owners and the grid. Models included in the final EMP should be updated to more accurately reflect future GHP market share when accounting for the long-term impact of state incentives – which can reflect significant system-wide benefits to the electric grid:

 ² "Pathways to Commercial Liftoff: Geothermal Heating and Cooling." U.S. Department of Energy. January 2025. p
<u>https://liftoff.energy.gov/wp-content/uploads/2025/03/LIFTOFF_DOE_Geothermal-Heating-and-Cooling_Updated-3.21.25.pdf</u>.

³ Ibid, p. 45.

 ⁴ See Draft Scoping Plan Appendix G: Annex 2: Key Drivers and Outputs, scenarios S2 and S3, residential and commercial space heating projections; December 2021, <u>https://climate.ny.gov/resources/draft-scoping-plan/</u>
⁵ The Brattle Group, "Heating Sector Transformation in Rhode Island," p. 39, https://energy.ri.gov/sites/g/files/xkgbur741/files/documents/HST/RI-HST-Final-Pathways-Report-5-27-20.pdf

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- Based on their high efficiency, GHPs provide a significant reduction in summer peak power demand and even greater savings during winter peaks compared to other electric heating options. These reductions in peak demand have significant benefits for the electric grid.
- A November 2023 study by the Oak Ridge National Laboratory estimated that widespread deployment of geothermal heat pumps could save a cumulative total of more than \$1 trillion dollars in energy system costs nationwide through 2050.⁶ This included a decrease of 185 GW of nationwide winter peak capacity by 2050.⁷

New Jersey Must Sustain its Recent Advances in Workforce and Installation Incentives

While the long-term operational cost savings from GHPs can be significant, up-front costs often remain a barrier to adoption, particularly for residential households and small businesses. Up-front incentives, such as those supported by BPU and the utilities in the Triennium 2 proceedings, therefore represent a critical element in advancing the widespread deployment of GHP systems. Federal tax credits have played an integral role by reducing the up-front cost of geothermal systems, but these credits are now at risk, making action by New Jersey all the more important.

• The EMP should continue to express support for the current utility incentives offered under Triennium 2 and for workforce development under the New Construction program to ensure that these policy supports are sustained into the future.

Continued Coordination to Improve Local Permitting

Permitting for geothermal systems remains a challenge that is deterring deployment and investment. We encourage the Department of Environmental Protection and the BPU to work together with Authorities Having Jurisdiction (AHJs) to streamline permit requirements for residential and commercial systems to help the state meet its emissions reduction and energy saving goals.

• <u>Providing tailored permit processes for geothermal systems and supporting education for AHJs on</u> <u>geothermal permitting and installation best practices</u> can help to streamline what can often be an onerous and difficult process under current practice.

⁶ Liu, Xiaobing, et. al., "Grid Cost and Total Emissions Reductions Through Mass Deployment of Geothermal Heat Pumps for Building Heating and Cooling Electrification in the United States," Oak Ridge National Laboratory, November 2023, p. xii, <u>https://info.ornl.gov/sites/publications/Files/Pub196793.pdf</u>

⁷ Ibid, p. xix. The "EFS + GHP" scenario models 68% electrification of residences and 49% electrification of businesses, representing approximately 100 million GHP systems installed; this yields a peak reduction of 1.85 kW per system (primary residential systems). See <u>https://www.census.gov/quickfacts/fact/table/US/HCN010217</u> for source of 144 million residences and <u>https://www.eia.gov/pressroom/releases/press485.php for source of 5.9</u> million commercial buildings.

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Conclusion

Geothermal systems offer nearly unlimited potential to New Jersey in meeting its energy goals in an efficient, low-carbon, cost-effective manner. GeoExchange is excited about the potential for geothermal heating and cooling in the state, and we look forward to working with the State to support the broad deployment of GHPs.

Sincerely,

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Ryan Dougherty Executive Director Geothermal Exchange Organization