



***Via Electronic Mail***

September 10, 2021

Mark Stewart, Program Manager  
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Maryland Department of the Environment  
1800 Washington Boulevard  
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**Sub: Comments from the Maryland Geothermal Association on the Building Energy Transition Plan - Discussion Draft (dated September 3, 2021)**

Dear Mr. Stewart,

Thank you for the opportunity to provide comments on the Discussion Draft of the Building Energy Transition Plan ("Discussion Draft") and share more about how geothermal energy can help meet the goals outlined in Maryland's 2030 Greenhouse Gas Reduction Act (GGRA) Plan.

This is written on behalf of the Geothermal Association of Maryland (MGA), which represents both residential and commercial drillers, installers and manufacturers that comprise our State's geothermal industry. Our comments align with the comments submitted by Dandelion Energy.

By harnessing the thermal energy in the ground beneath our feet, geothermal systems are the most efficient, reliable, and lowest carbon approach to electrifying heating and cooling in buildings. Ground source heat pumps (GSHPs), also sometimes referred to as geothermal heat pumps, are recognized by the U.S. Environmental Protection Agency as among the most efficient heating and cooling technologies currently available and are up to 500% more efficient than standard heating systems. According to Maryland Commission on Climate Change's "Decarbonizing Buildings in Maryland" report as well, GSHPs are up to 500% more efficient than standard heating systems and outperform all other electrification technologies, such as air source heat pumps, and offer even greater emissions reduction.<sup>1</sup>

Additionally, geothermal energy is a labor- and capital-intensive industry that creates high paying jobs in Maryland. Geothermal installation jobs are high-skill and high-wage, with geothermal drillers making \$75,000 to \$120,000 or more per year. We estimate that each system installation creates 1 week's worth of work for a crew of 5.

Customer adoption of GSHPs is only just beginning to accelerate and high upfront costs, low consumer awareness and inadequate incentives remain big barriers to growth. Despite their

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<sup>1</sup> Maryland Commission on Climate Change, [Decarbonizing Buildings in Maryland](#), Buildings Subgroup Report to the Mitigation Work Group, September 2020, on page 11.

enormous efficiency and greenhouse gas (GHG) emissions reduction potential, GSHPs currently account for a small fraction of the heating and cooling market. MGA is working with our fellow industry stakeholders and supporters to overcome existing awareness and cost barriers. MGA is also focused on ways to democratize the geothermal market and enable low- and moderate-income families and individuals to afford and install a geothermal system.

As Maryland moves to meet the State's ambitious target to reduce emissions by 40% by 2030 and 80-95% of gross emissions by 2050 as outlined in the GGRA Plan, it will need not only to decarbonize its electricity grid, but to dramatically reduce its reliance on the fossil fuel energy sources that currently heat the majority of the State's residential and commercial buildings. About 17.5% of Maryland's GHG emissions come from heating and cooling in buildings. High-efficiency GSHPs must be part of the solution.

The MGA applauds the State's leadership for outlining ambitious GHG emissions reductions goals, particularly through building decarbonization, and for developing the Building Energy Transition Plan. In particular, we would like to call attention to the recently enacted HB 1007 which creates a carve-out for geothermal systems in the State's Renewable Energy Portfolio Standard (RPS).<sup>2</sup> We applaud the state legislature and Governor for taking that action and note that the carve-out will incentivize higher GSHP adoption and strongly support the Commission's stated goals.

We respectfully submit the following comments on the Discussion Draft of the Plan. We believe these comments would help to meaningfully grow geothermal energy in the State and achieve GHG emissions reductions targets.

**Comments on Discussion Draft:**

**I. Discussion Draft Recommendations we strongly endorse**

At the outset, we would like to commend the Buildings Sub-Group and the Energy + Environmental Economics (E3) for developing a strong and forward-looking Discussion Draft. We are in agreement with several recommendations of the Discussion Draft and urge the Commission to incorporate these in the final Plan.

In particular, we strongly endorse the following Recommendations:

- (a) Developing an all-electric construction code for all new residential construction and commercial construction where cost-effective,
- (b) Developing a clean heat retrofit program providing incentives for fuel switching to existing residential buildings,

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<sup>2</sup> Maryland House Bill 1007, *Renewable Energy Portfolio Standard and Geothermal Heating and Cooling Systems*, approved by the Governor on May 18, 2021.

- (c) Mandating a building emissions standard for existing commercial buildings,
- (d) Changing the goals of EmPOWER away from electricity reduction to a portfolio of mutually reinforcing goals, including GHG emissions reduction, and enabling fuel switching, and
- (e) Ensuring that efficient price signals around future electric and gas rates are conveyed to customers.

## II. **Additional Recommendations we suggest the Commission include in the final Plan**

1. We urge the Commission to ensure that E3's model and comparison of High Electrification and Electrification with Fuel Backup scenarios integrate the following factors, if they have not already done so.

(a) *The peak benefits of GSHPs:*

GSHPs offer significant grid benefits in the form of reducing system-wide peak electric load. GSHPs increase baseload demand without meaningfully increasing seasonal peaks. In contrast, air source heat pumps (ASHPs), while providing electrification benefits, also increase peak usage.

A recent study by the Brattle Group assessed the peak system impacts of GSHPs in Maryland and found that significant deployment of GSHPs would meaningfully reduce summer peak electricity demand and have a much lower impact on winter peak electricity demand relative to ASHPs. To quote from the study: "For a representative Maryland house, a GSHP would reduce peak consumption by about 1.5 kW and help save about \$179 per year in overall peak-related system costs associated with generation, transmission and distribution."<sup>3</sup>

A similar study by the Brattle Group for Rhode Island also found that fully electrifying New England's heating sector using GSHPs would only minimally impact peak demand and leave energy prices unchanged, whereas switching to ASHPs would nearly double the peak and increase electricity prices by up to 20%.<sup>4</sup> It is also worth noting that NYSERDA in applying its cost benefit test to GSHPs in New York, identified system-wide peak electric load reduction as a key benefit, in addition to energy savings<sup>5</sup>

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<sup>3</sup> The Brattle Group, [Ground Source Heat Pumps: Peak Impacts in Maryland](#), pages 3-4 and 1.

<sup>4</sup> The Brattle Group, [Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050](#), pages 30-31

<sup>5</sup> NYSERDA, New Efficiency: New York - Analysis of Residential Heat Pump Potential and Economics, Page 58, <https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/NYSERDA/18-44-HeatPump.pdf>

(b) *The medium-term risk of the carbon content of fuels not going down sufficiently:*

A key assumption behind E3's Electrification with Fuel Backup scenario is that fossil fuels will be gradually replaced by low-carbon renewable fuels. It is worth noting, however, that low or zero carbon fuels that can be delivered at a reasonable cost and safely through natural gas infrastructure do not currently exist today.<sup>6</sup> On the contrary, technologies to fully electrify buildings do exist.

A medium-term risk of E3's Electrification with Fuel Backup scenario is that these alternative fuels will take time to develop and/ or, if developed, may not have as low a carbon content as envisaged. Given that buildings invest in space heating and cooling technologies for several years in advance and are unlikely to switch until end of life, there is risk of being locked into hybrid heating and cooling systems that do not provide the desired carbon benefits.

(c) *A cost-effectiveness test that adequately accounts for carbon reduction and all fuel savings:*

The Discussion Draft compares different scenarios, particularly the High Electrification and Electrification with Fuel Backup scenarios, based on cost-effectiveness. It is not clear what cost-effectiveness test E3 has applied to this comparison and the extent to which this test accounts for GHG emissions reductions and fuel savings. Given the State's ambitious emissions reduction goals, we urge the Commission to ensure that the E3 model and cost-effectiveness test fully account for emissions reductions and fuel savings, if it does not already do so.

2. We urge the Commission to recommend that the all-new construction code should be applicable to *all new commercial* construction post-2024.
3. We urge the Commission to recommend that the Clean Heat Retrofit Program should be extended to *existing commercial* buildings where fuel switching is cost-effective.
4. Given the medium-term risk of the carbon content of fuels not going down sufficiently, we urge the Commission to recommend that policy mandates be adaptable and switch to incentivizing only the High Electrification pathway if changes in the existing fuel mix do not meet certain carbon reduction goals by specific target dates.

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<sup>6</sup> See Erin M. Blanton, Dr. Melissa C. Lott, And Kirsten Nicole Smith, [Investing In The US Natural Gas Pipeline System To Support Net-Zero Targets](#), Columbia SIPA, April 2021, on page 8: "Due to a lack of readily available zero-carbon fuel substitutes, the nation is likely to require natural gas in its energy mix for decades to come..."

5. We urge the Commission to recommend that GSHPs should be explicitly identified as one of the pathways to meet the Building Emissions Standard.
6. We urge the Commission to recommend that EmPOWER incentives for installation of GSHPs be changed from a per-project incentive to a per-ton incentive.<sup>7</sup>

We thank you again for this opportunity to provide comments on the Discussion Draft of the Building Energy Transition Plan

Sincerely,

*Adam Santry*

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<sup>7</sup> This would align Maryland with states such as New York, Connecticut and Massachusetts which offer incentives on a per-ton basis.