



Via Electronic Mail
October 4th, 2021

RE: Comments from Dandelion Energy on the MI Power Grid: New Technologies and Business Models Draft Staff Report

Dear Ms Wang,

Thank you for the opportunity to comment on the Draft Staff Report and for including Dandelion Energy in the MI Power Grid New Technologies and Business Models workgroup. In these comments we reinforce recommendations made by Staff and share additional information about how geothermal energy can contribute to a clean energy future for Michigan and Governor Whitmer's goal of making the state carbon-neutral by 2050. We want to emphasize that:

- 1. Ground Source Heat Pumps benefit consumers and the electric grid.**
- 2. Cost effectiveness tests should take into account the full benefits of clean heating technologies, including fuel savings and carbon value.**
- 3. Scaling GSHPs and geothermal jobs in Michigan will depend on increased consumer rebates.**

Dandelion is one of the leading residential geothermal companies in the United States. Geothermal systems are the most efficient, reliable, and lowest carbon approach to electrifying home heating and cooling. Dandelion provides high-efficiency ground source heat pumps (GSHPs) and we are on a mission to enable any homeowner to install a geothermal system and see instant energy bill savings.

The geothermal industry is where solar and wind were 15 years ago. Despite the tremendous potential of GSHPs, they currently account for a small fraction of the heating and cooling market due to up-front costs, lack of awareness and low state incentives - barriers that are noted in the Draft Report.

Dandelion is overcoming these barriers through rapid technological innovation and economies of scale. In the past year, Dandelion has expanded from New York and is now serving customers in Connecticut, Massachusetts, and Vermont as a direct result of increased state incentives for GSHPs in those states.

The long-term potential for GSHPs is enormous. At scale, a national analysis by the Oak Ridge National Laboratory found that switching all buildings to GSHPs could reduce yearly CO₂ emissions by 356.3 million Mt, and reduce yearly U.S. energy costs by \$49.8 billion¹.

1. Ground Source Heat Pumps benefit consumers and the electric grid.

Both air source heat pumps (ASHPs) and GSHPs will be necessary technologies for electrifying and decarbonizing heating and cooling. In the Staff report, the term “heat pump” is sometimes used to describe both the attributes of ASHPs and GSHPs. Due to the differences between GSHP and ASHP systems, the Draft **Staff report could be strengthened by clarifying when the text is referring to heat pumps generally, and when it is referring to characteristics of either ASHP or GSHP.**

There are unique features and benefits of GSHPs that should be taken into consideration by policymakers:

- A) GSHPs benefit consumers by providing **whole home heating and cooling solutions, without fuel back-up**, and perform better than alternatives in cold climates.

GSHPs typically serve as whole system replacements, entirely eliminating the need for delivered fuels such as fuel oil, propane, or gas in a home. GSHPs provide heating in cold climates without compromising performance because they pull heat from the ground, where it remains a constant 55 degrees. All of Dandelion’s products exceed Energy Star Tier 3 requirements, which for closed-loop, water to water means they have an EER 17.1 and a COP of 3.6.²

- B) GSHPs provide **grid benefits** relative to other electrification technologies.

GSHPs increase baseload electricity demand without meaningfully increasing seasonal peaks. This is in contrast to ASHPs, which provide electrification benefits, but also increase peak usage. A study by the Brattle Group 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%.³

¹ Oak Ridge National Laboratory, [GeoVision Analysis Supporting Task Force Report: Thermal Applications— Geothermal Heat Pumps](#), Page 1,

² ENERGY STAR® [Program Requirements for Geothermal Heat Pumps](#), Version 3.1,

³ The Brattle Group, [Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050](#), Pages 30-31

Dandelion estimates that, in Detroit, Michigan, a 5 ton GSHP system would have a peak impact in winter heating season of 3.69 KW, while the peak impact of top-of-the-line ASHP alternatives such as a Mitsubishi Hyper Heat Mini Splits would be 80% greater, at 6.62 KW. GSHPs also minimize the growth in annual electricity load on the grid and save homeowners money on their bills. Based on heating and cooling energy requirements in Detroit, Dandelion estimates that a **GSHP system would use 33% less electricity than a comparable ASHP system** on an annual basis.

2. Cost effectiveness tests for energy efficiency should take into account the full benefits of clean heating technologies, including fuel savings and carbon value.

New York and Connecticut are among the states that permit all fuel savings to be included in their cost-benefit analyses for energy efficiency programs. In applying a Societal Cost Test to fully capture the benefits associated with geothermal heat pumps in New York, NYSERDA has found three significant areas of benefit beyond energy savings:⁴

- The value to ratepayers of reducing systemwide peak electric load, which was discussed above.
- The societal value of reducing greenhouse gas emissions (“carbon value”), which is valued based on the federal social cost of carbon⁵
- The so-called “inverse cost shift” effect, which can result in heat pump customers paying for more than their fair share of fixed electric grid costs, reducing burdens on other ratepayers.

As noted in the draft Staff report “The EWR standard is designed as a percentage of electric sales for electric utilities and a percentage of natural gas sales for natural gas utilities. The Act is silent on the effects of these programs in targeting climate, greenhouse gas reduction or carbon reduction. ... This essentially bars EWR incentives from being provided in fuel switching scenarios, like instances where an electric heat pump might replace inefficient gas heat.”⁶

The current design of the EWR standard presents a tremendous obstacle to growing the market for GSHPs and will severely limit the ability of clean heating technologies to be properly valued in Michigan. Dandelion recognizes that there are statutory limitations

⁴ NYSERDA, [New Efficiency: New York - Analysis of Residential Heat Pump Potential and Economics](#), Page 58,

⁵ DEC Announces Finalization of 'Value of Carbon' Guidance, 12/30/20, <https://www.dec.ny.gov/press/122070.html>

⁶ Staff Report, p. 112

that may impede the Commission's ability to fully value clean heating technologies and that legislative action may be required to remove these impediments. Nonetheless, Dandelion:

- A) Strongly **supports Staff's recommendations to develop fuel agnostic incentives.**
- B) Strongly **supports Staff's recommendation to consider a wide range of factors such as environmental sustainability, equity, and environmental justice** when evaluating "just" rates.

As noted above, New York and Connecticut are examples of states that incorporate carbon value into cost effectiveness. Other states, such as Maryland, are in the midst of addressing this barrier. A recent "Building Energy Transition Plan" from the MD Commission on Climate Change recommends that the core objective of the statewide energy efficiency and conservation program "change from electricity reduction to a portfolio of mutually reinforcing goals, including GHG emissions reduction, energy savings, net customer benefits, and reaching underserved customers."⁷

3. Scaling GSHPs and geothermal jobs in Michigan will depend on increased consumer rebates

Dandelion is headquartered in New York State. Since launching in 2017, we've created over 135 jobs, 75% of which are either drilling or HVAC installation jobs. To service new markets, we typically open new warehouses and train new drilling crews and installers, resulting in an average of 50 jobs per warehouse and multiple warehouses per state. Just as the solar industry retrained local contractors, the geothermal industry does the same for the HVAC contractors and for oil, gas, and water well drillers. This extends to our leadership team. Dandelion's VP of Drilling, Jason Smith, transitioned to geothermal after 18 years in the oil and gas industry due to tremendous growth potential in the geothermal industry.⁸

- A) Michigan can jump-start residential geothermal installations by **moving from a per-project funding model to a per-ton funding model** for GSHPs, where incentives increase as the capacity of the system increases.
- B) We would recommend setting the incentive to at least **\$2,000 per standard heating ton for residential GSHP systems.**

⁷ Maryland Commission on Climate Change, Draft Building Energy Transition Plan, at p. 12: <https://mde.maryland.gov/programs/Air/ClimateChange/MCCC/MWG/Building%20Energy%20Transition%20Plan%20-%20MWG%20Draft.pdf>

⁸ Eletrek, [This Fossil-Fuel Exec Jumped to Geothermal. He Tells us Why](#)

Meaningful per-ton incentives for GSHPs have been present in the New York market since Dandelion's inception and are one of the main reasons Dandelion decided to establish its headquarters there. The presence of stable, per-ton incentives and a focus from NYSERDA and the utilities on increasing awareness among consumers for GSHPs have allowed Dandelion to scale and continue to drive down costs.

Dandelion entered Connecticut in 2020, and Vermont and Massachusetts in 2021, following the introduction of per-ton incentives in each state. Dandelion is now actively considering what markets to enter next, including Michigan. The policy environment will be a major driver of our decision.

When customers select geothermal, they do so because the economics work for them. If they choose a financed option, they're looking for savings on day one, which we're able to offer with adequate state incentives in New York, Connecticut, Vermont, and Massachusetts, and we would be pleased to offer to customers in Michigan.

Conclusion

Dandelion again thanks Staff for the opportunity to provide comments. GSHPs offer significant grid benefits and can provide homeowners with efficient, clean heating and cooling at a lower cost than any other technology on an annualized basis. To realize the full potential of clean heat technologies, Michigan should include fuel savings and carbon savings in benefits calculations. To spur geothermal adoption and job growth, Michigan should transition to a per-ton incentive for consumer rebates.

We look forward to remaining engaged in your planning processes, while we look toward Michigan as a possible market for our products and services.

Sincerely,

A handwritten signature in black ink, appearing to be 'MS', with a long horizontal line extending to the right.

Michael Sachse

CEO, Dandelion