February 8th, 2022

VIA ELECTRONIC FILING
Aida Camacho-Welch
Secretary of the Board
44 South Clinton Avenue, 1st Floor
Post Office Box 350
Trenton, NJ 08625-0350

RE: In the Matter of Natural Gas Commodity and Delivery Capacities in the State Of New Jersey – Investigation of the Current and Mid-Term Future Supply and Demand (BPU Docket No. GO20010033)

Dear Secretary Camacho-Welch,

Thank you for the opportunity to provide comments on the findings and recommendations that London Economics International, LLC ("LEI") presented in its final gas capacity report entitled "Final Report: Analysis of Natural Gas Capacity to Serve New Jersey Firm Customers." Dandelion will focus its comments on the viability of the proposed non-pipeline alternatives ("NPAs"), specifically focusing on the potential for building electrification technologies such as geothermal heat pumps ("GHPs") to reduce gas demand and decarbonize heating and cooling.

Summary of Dandelion's observations and recommendations regarding the viability and potential implementation of GHP systems in New Jersey:

1. There is a significant untapped potential to deploy geothermal heat pumps in New Jersey in new and existing homes.
2. As the BPU evaluates opportunities to accelerate the adoption of clean heating and cooling technologies, it should look both to neighboring states such as New York, Connecticut, Massachusetts, and Maryland as well as the innovative "Clean Heat" pilot program recently established by Rockland Electric Company.
3. Dandelion is in the process of entering the New Jersey market, both for retrofits and new construction, and is positioned to rapidly expand with the proper incentive mechanisms in place.
4. The BPU should phase out incentives to switch from oil to gas heating, as recommended by LEI, as these customers are an ideal target for electrification.

Dandelion Energy is one of the nation's leading providers of home geothermal heating and cooling systems. Our mission is to make GHPs so inexpensive and easy to install that we enable a widespread shift from fossil heating to renewables. Harnessing the thermal energy in the ground beneath our feet, geothermal systems are the most efficient, reliable, and lowest carbon approach to electrifying home heating and cooling.

Geothermal is the **most efficient** way to heat and cool buildings, according to the U.S. EPA. It is also the **lowest cost** way for homeowners to heat and cool their homes. As such, geothermal represents a key technology for achieving economy-wide decarbonization without meaningfully increasing peak demand, advancing energy affordability and value, and supporting the growth of the green economy.

Over the past two years, Dandelion has expanded from New York to neighboring states including Connecticut, Massachusetts, and Vermont. In all four of these states, policymakers and utilities have recognized the potential of GHPs to address climate, grid, and customer needs and established meaningful, prescriptive incentives to accelerate adoption.

Dandelion agrees with LEI's recommendations to focus on investment of demand-side NPAs to reliably meet gas demand and avoid the need for new pipeline capacity.[1] As New Jersey considers NPAs that could be utilized by the State in the event of a gas capacity constraint, GHPs can and should be a core part of the solutions offered to customers.

Additional Background On Geothermal Energy and Dandelion

1. **Benefits of Geothermal Heating and Cooling**

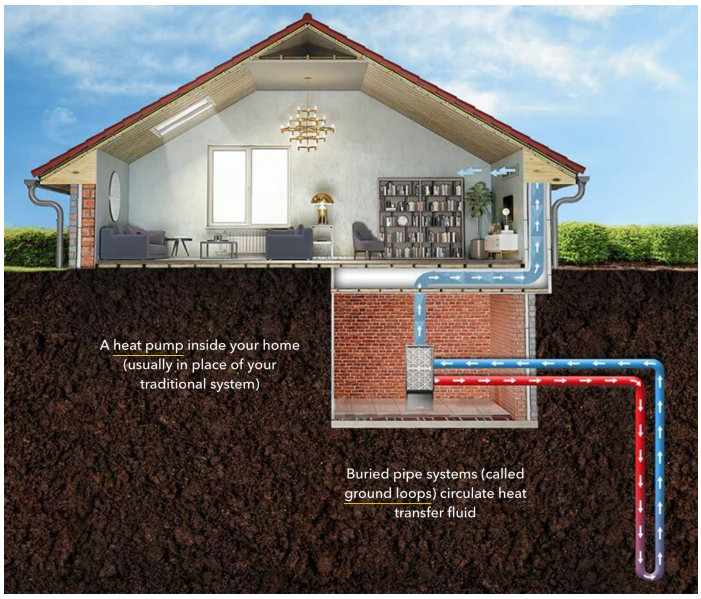
GHPs work by collecting heat from the ground, which remains a constant 55 degrees Fahrenheit year round, and transferring it to heat a home. In the summer, the system works in reverse, removing heat from the home and transferring it to the ground. When a GHP system is installed, any existing fossil fuel boiler or furnace is no longer needed and is disconnected and usually removed. GHPs do not require any back-up fossil or electric resistance heating, even on the coldest winter days.

GHPs are not only the single most efficient way to heat and cool buildings, they're the least expensive for homeowners on an ongoing basis. All of Dandelion's

[1]LEI Gas Capacity Report, at p. 13

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].

Figure 1: How Geothermal Works



GHP systems have the potential to reduce carbon emissions by 80% as compared to conventional fuel oil systems and 65% as compared to conventional propane systems.[3] Residents will typically see a 40-50% reduction in total annual energy costs when switching to a geothermal heating and cooling system – factoring in both their savings in fuel and A/C costs they are no longer paying, and the electricity costs to run the heat pump. The majority of our customers finance their geothermal system, and by doing so they can save money from day one as compared to their previous energy bills.

Geothermal heat pumps also offer significant grid benefits; they increase baseload demand, decrease summer peaks and don't meaningfully increase winter peaks. This is in contrast to technologies like air source heat pumps, which provide electrification benefits, but also dramatically increase peak demand. A study by the Brattle Group found that fully electrifying New England using GHPs would only minimally impact peak demand and leave energy prices unchanged.[4]

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[2] ENERGY STAR® Program Requirements for Geothermal Heat Pumps, Version 3.1, https://www.energystar.gov/sites/default/files/specs/private/Geothermal_Heat_Pumps_Program_Requirements%20v3.1.pdf

[3]Savings calculated by Dandelion and available on Dandelion's website: https://dandelionenergy.com/environmental-impact

[4] The Brattle Group, Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050, Pages 30-31, https://www.brattle.com/reports/heating-sector-transformation-in-rhode-island

Geothermal heat pumps are being embraced across New England and the Mid-Atlantic for their potential to reduce overall energy consumption and achieve decarbonization goals. In the past two years, utilities in New York, Vermont, Connecticut, and Massachusetts have all significantly increased incentives for GHPs to accelerate adoption. Maryland has adopted a 'carve-out' in its Renewable Energy Credit market for geothermal as an alternative form of incentive.

2. Dandelion's History, Target Customer, and Market Potential

Dandelion's goal is to bring geothermal to all single family home markets. While we install geothermal systems in homes of all sizes, our typical customer has a 1500-3000 SQFT home, which we can easily and cost-effectively convert to geothermal using a single 4 or 5 ton heat pump system. Dandelion's software-guided system design and smaller drilling rigs allow us to right-size systems and offer geothermal on smaller lots than what is accessible by traditional geothermal installers. Dandelion also offers a financing option, which most of our customers select.

When customers select geothermal, they do so not simply because of the health and greenhouse gas benefits, but also because the economics work for them. In the event that they choose a financed option, they're looking for savings on day one, which we're able to offer in New York, Vermont, Massachusetts, and Connecticut with adequate state incentives.

Dandelion is headquartered in New York State. Since launching in 2017, we've created over 180 jobs, 75% of which are either drilling, plumbing or HVAC installation jobs. 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. To service new markets, we typically open new warehouses and train new drilling crews and installers, resulting in an average of 25 jobs per warehouse and multiple warehouses per state. We also work with dozens of subcontractors to best serve our customers and continue to actively hire in all of our markets. We currently have four facilities in New York, one in Connecticut, and will soon be opening our first warehouse in Massachusetts.

Dandelion's Observations and Recommendations in response to the LEI Gas Capacity Report

1. **There is a significant untapped potential to deploy geothermal heat pumps in New Jersey, both in new and existing homes**

Over 70,000 homeowners in our current territory have expressed interest through our online portal and we are working with more homeowners everyday to assess their properties for geothermal. Since entering Connecticut less than two years ago and Massachusetts within the past three months, we are already on pace to install hundreds of GHPs in these states each year.

According to US Census data, there are roughly 1.375 million New Jersey homeowners with natural gas and another 300,000 New Jersey homeowners who currently heat with fuel oil and propane.[5] These customers are all eligible candidates for GHPs and Dandelion serves primarily the retrofit market in neighboring states such as New York, Connecticut, and Massachusetts.

Increasingly, Dandelion is also serving the new construction market. Due to the nature of new construction, drilling and installation costs for GHPs are 25-40% lower than they are for retrofits. Because GHPs provide full heating and cooling load, installing a system during construction can eliminate the need for delivered fuels from the onset.

2. **As the BPU evaluates opportunities to accelerate the adoption of clean heating and cooling technologies, it should look both to neighboring states such as New York, Connecticut, and Massachusetts as well as the innovative "Clean Heat" pilot program recently established by Rockland Electric Company.**

Meaningful per-ton incentives for GHPs 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 GHPs have allowed Dandelion to scale and continue to drive down costs that will result in lower prices for customers in the future.

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[5] US Census, American Community Survey, House Heating Fuel, 2019 Data, US Census, American Community Survey, House Heating Fuel, 2018 Data, https://data.census.gov/cedsci/table?q=B25040%3A%20HOUSE%20HEATING%20FUEL&g=0400000US25&tid=ACSDT1Y2018.B25040&hidePreview=true

For example, in 2017, Dandelion was paying nearly twice as much on average per heat pump. With increased demand in New York, Dandelion obtained access to scaled pricing and direct-sourced contract manufacturing. In 2019 we were able to bring on a second manufacturing partner at similarly competitive prices because of our growing order volume. As scale continues to increase, heat pump prices should become even more competitive than they are today, driving costs for homeowners down further.

Today, as part of the Clean Heat Program,[6] each utility in New York offers a per-ton incentive for GHPs, which varies based on factors including local labor costs and price of electricity. This per-ton incentive applies across all fuel types and for both home retrofits and new construction projects. The limit for prescriptive incentives is 300,000 BTU/h, or 25 tons, and incentives for projects beyond 25 tons have a pathway to approval of a customer rebate.[7]

Chart 1: New York Utility Incentives[8]

Utility Incentive	$ per 10,000 BTU/h	Total for Standard 5T GHP system
Central Hudson	$2,000	$10,238
ConEd - Regular	$5,000	$33,273
ConEd - Gas Constraint	$6,500	$20,000
National Grid	$1,500	$7,678
NYSEG/RG&E	$1,500	$7,678
O&R	$2,000	$10,238

The “ConEd - Gas Constraint” enhanced incentive indicated in the table ($6,500/ton) was established during July 2021 to further spur geothermal installations in the area of ConEd’s territory where they face constraints in their ability to provide new gas hook-ups for customers who are currently on electric resistance, oil, or propane for heating and would potentially explore gas heating as an option. The enhanced rebate has led to a three-fold increase in the number of customers signing contracts with Dandelion for GHPs systems in this area since August 2021. The gas constraints facing

[6] NYSERDA, Clean Heat Program, https://saveenergy.ny.gov/NYScleanheat/
[7] See ConEd’s website, “Submit Heat Pump Projects and Custom Incentives”: https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-commercial-industrial-buildings-customers/electric-heating-and-cooling-technology-for-commercial-industrial-buildings/submit-heat-pump-projects-and-custom-solutions
[8] NYS Clean Heat Statewide Heat Pump Program, http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={22191788-C743-40AF-B680-762A19FA4B1E}

ConEd, and their creative approaches to meeting customer needs through heat pump rebates in their territory, could be a helpful case study for BPU consideration.

Vermont[9] and Connecticut[10] have adopted similar per-ton models as New York, while Massachusetts has taken a "whole-home" approach in its 2022-2024 Three-Year Energy Efficiency Plan, awarding a fixed amount of $15,000 per household for GHP installations.[11]

As of February 1st, 2022, Rockland Electric Company ("RECO") officially launched their "Clean Heat" pilot,[12] and offers $2,000 per 10,000 BTU/h of full load heating capacity. The incentive level and program design aligns closely with the successful program offered by its sister company, O&R, in New York.

The one exception is that the RECO program applies only to retrofits and not new construction. In New York, new construction currently comprises 20% of total installations for Dandelion Energy, with the potential for further growth as drilling and installation costs tend to be lower than on retrofit projects. As it looks toward building electrification, we strongly encourage New Jersey to design incentive programs that encourage installation of heat pumps in both existing and new homes.

3. **Dandelion is in the process of entering the New Jersey market, both for retrofits and new construction, and is positioned to rapidly expand with the proper incentive mechanisms in place.**

Dandelion currently has warehouses in Mount Kisco, Peekskill, and Bay Shore in New York, which are positioned to immediately serve the northern half of New Jersey. As a direct result of the RECO Clean Heat program, Dandelion is making immediate plans to begin serving the retrofit market in RECOs service territory.

Dandelion also sees a huge potential for new construction in New Jersey. As mentioned above, installation costs for GHPs in new construction projects tend to be 25-40% lower than retrofits. We are partnering with a major national homebuilder to install geothermal heat pumps in one of their developments in New Jersey in Q1 2022.

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[9] GMP, News Release, 5/19/21
[10] Connecticut Saves, Rebates and Incentives, https://energizect.com/your-home/rebates-and-incentives
[11] Mass Saves, "2022 residential ground source heat pump rebates", https://www.masssave.com/saving/residential-rebates/-/media/AA9587351AAC453BA55FF2B9ABE93B83.ashx
[12] Clean Heat Pilot approval was granted by the BPU on 6/9/21, see: https://www.nj.gov/bpu/pdf/boardorders/2021/20210609/2E%20ORDER%20RECO%20CEA.pdf

Pending successful installation, we will evaluate opportunities and barriers to expand this program throughout the state.

To serve the rest of New Jersey, Dandelion would open additional warehouses within the state and scale up work with local contractors. For example, after entering Connecticut in late 2020, Dandelion opened a warehouse in Hartford less than a year later to better serve the market. To meet rising demand throughout our service territory, Dandelion partners with local subcontractors and our drillers and other master tradesmen hold licenses throughout the Northeast, including New Jersey.[13]

4. **The BPU should phase out incentives to switch from oil to gas heating, as recommended by LEI**

As stated by the LEI in its report, "An obvious step towards building electrification is to stop subsidizing near-term consumer choices that are at odds with long-term goals."[14] Dandelion concurs with this observation both because GHPs have the potential to reduce carbon emissions by 80% as compared to conventional fuel oil systems[15] and because the economics of switching from fuel oil to GHPs presents such an attractive value proposition for customers today.

Conclusion:

Thank you for the opportunity to provide additional detail on the potential for building electrification technologies such as GHPs to reduce gas demand and decarbonize heating. Dandelion remains very excited about the growth potential of GHPs in New Jersey and the role that GHPs can play in meeting reliability and climate goals

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[13] PR Newswire, "Dandelion Energy Announces Acquisition of Connecticut-Based Glacier Drilling, Supporting Northeast Expansion", 1/18/2022, https://www.prnewswire.com/news-releases/dandelion-energy-announces-acquisition-of-connecticut-based-glacier-drilling-supporting-northeast-expansion-301463004.html

[14] LEI Gas Capacity Report, at p. 117

[15] Savings calculated by Dandelion and available on Dandelion's website: https://dandelionenergy.com/environmental-impact

Respectfully submitted,

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