



Draft Scoping Plan Comments
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

Dandelion Energy Written Comments on the New York State Climate Action Council Draft Scoping Plan

Thank you for the opportunity to provide comments on the New York State Climate Action Council Draft Scoping Plan. Dandelion Energy is one of the nation’s leading providers of home geothermal heating and cooling systems. Our mission is to make geothermal heat pumps so inexpensive and easy to install that we enable a widespread shift from fossil heating to renewables. Dandelion Energy applauds the state of New York for its visionary goals and progress to date in implementing the Climate Leadership and Community Protection Act (CLCPA), and supports the Draft Scoping Plan and the Council’s findings that “energy efficiency and end-use electrification are essential parts of any pathway that achieves New York State emission limits.”¹

The Draft Scoping Plan recommends achievable pathways to meet the CLCPA requirements and support the installation of up to 1.8 million heat pumps by 2030² and creation of over 200,000 jobs (including over 60,000 residential HVAC jobs)³ and associated workforce training. The Draft Scoping Plan also supports the goal of the CLCPA in ensuring that 40% of the benefits of the clean energy and energy efficiency programs accrue to disadvantaged communities, including through targeted incentives to low- and moderate-income (LMI) households. Dandelion further recommends additional legislative and regulatory actions that the Council should endorse in the Final Scoping Plan to strengthen the implementation of the CLCPA, generate additional savings for New York residents, and sustain New York’s leadership in climate action.

¹ New York State Climate Action Council Draft Scoping Plan, p. 73, December 30, 2021.

² Draft Scoping Plan p. 73

³ Climate Action Council Just Transition Working Group (JTWG), 2021 Jobs Study, p. 84, December 2021, <https://climate.ny.gov/-/media/Project/Climate/Files/JTWG-Jobs-Report.ashx>

Summary of Dandelion Energy’s Comments and Recommendations

1. Sustaining and enhancing financial incentives for geothermal will be essential in motivating homeowners and building owners to install heat pumps at the necessary scale to meet the CLCPA requirements.
2. New York should adopt regionally appropriate drill depth thresholds for exempting closed-loop geothermal boreholes from drill permit requirements.
3. New York should expand tax incentives to lower overall system costs and support LMI homeowners.
4. Expanded low-cost finance offerings will be necessary to ensure the benefits of clean, high-efficiency geothermal heating are available to all New Yorkers.
5. The Final Scoping Plan should sustain the recommended timelines for adopting all-electric State building codes for new construction to meet the CLCPA requirements.
6. Zero-emission standards for heating and cooling of existing buildings, coupled with additional incentives, will be necessary to meet the CLCPA requirements.

Full Comments and Recommendations by Dandelion Energy

Benefits of Geothermal Heating and Cooling Systems

Geothermal has a critical role to play in decarbonizing the building sector and transitioning to an economy run on clean energy, and New York is already a national leader in supporting a robust geothermal market. The New York State Energy Research and Development Authority’s (NYSERDA) groundbreaking clean heating and cooling program, with rebates now administered by the utilities, has supported thousands of heat pump installations. The NYSERDA loan program also provides a critical financing option for customers. Yet as the Draft Scoping Plan highlights, New York still needs to do more.

Geothermal is among the **most efficient** ways to heat and cool buildings, according to the U.S. Environmental Protection Agency.⁴ It is also the **lowest cost** way for homeowners to heat and cool their homes. As such, geothermal heat pumps represent a key technology for advancing energy affordability and value, supporting the growth of the green economy, and achieving economy-wide decarbonization without meaningfully increasing peak demand.

Geothermal heat pump systems have the potential to reduce carbon emissions by 80% as compared to conventional fuel oil systems and 65% as compared to

⁴ “Geothermal Heat Pumps,” Energy Star, U.S. Environmental Protection Agency, accessed June 29, 2022, https://www.energystar.gov/products/geothermal_heat_pumps

conventional propane systems.⁵ 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. While operating costs are low, the upfront installation cost of geothermal presents a barrier to many homeowners.

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 increase peak demand. A study by the Brattle Group found that fully electrifying New England using geothermal heat pumps would only minimally impact peak demand and leave energy prices unchanged.⁶ Sensitivity analysis conducted in support of the Draft Scoping Plan found that significantly increasing the proportion of ground source heat pumps and district heating vs. air source heat pumps for New York State would decrease annual electric loads by 2.8% and peak electric loads by up to 10.8% by 2050, with resultant benefits of over \$10 billion. The analysis highlights that these calculations may shift due to changes in the cost of heat pump technologies and evolution of heat pump performance, so the true benefits may be even greater.⁷ **Achieving these benefits will require additional incentives and regulatory support for geothermal system deployment, workforce development, and technology enhancement.**

Long-term Funding and Stability for Incentives

1. Sustaining and enhancing financial incentives will be essential in motivating homeowners and building owners to install heat pumps at the necessary scale to meet the CLCPA requirements.

Dandelion supports Key Sector Strategy B4, *Scale Up Public Financial Incentives*, and the Council's finding that "expansion of financial incentive programs to motivate early adoption in market-rate housing and commercial buildings will be needed for at least the coming decade."⁸ The New York State Clean Heat Program and the Long Island Public Service Electric and Gas Company (PSE&G)'s Home Comfort Program

⁵Savings calculated by Dandelion and available on Dandelion's website:

<https://dandelionenergy.com/environmental-impact>

⁶ 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>

⁷ Draft Scoping Plan, Appendix G, p. 80, December 2021.

⁸ Draft Scoping Plan, p. 132

have demonstrated success in motivating homeowners to invest personal funds, supported by utility, state, and federal incentives, to decarbonize their homes.

In addition to direct customer incentives, Dandelion encourages New York State and the utilities to enhance midstream and upstream incentives for heat pump and heat pump water heater manufacturing and distribution to support continued growth of the broader heat pump industry. Any new or enhanced midstream and upstream incentives should be additive to customer rebates to ensure continued growth in consumer demand. Expanded and enhanced incentives across homeowners, manufacturers, and distributors will be necessary to strengthen the value proposition and ensure New York can achieve 1.8 million heat pumps installed in residences by 2030.

Permitting and Regulatory Updates

2. New York State should adopt regionally appropriate drill depth thresholds for exempting closed-loop geothermal boreholes from drill permit requirements.

Current regulations effectively limit borehole depth for closed loop geothermal systems to 500 feet throughout New York state. While it is common practice for geothermal installers to drill deeper boreholes in neighboring states, the existing regulations make it impractical and financially unfeasible to do so in New York. These regulations, and the resultant effective capping of borehole depth at 500 feet, significantly increase costs for homeowners and building owners and disincentivize installation of geothermal energy systems which will be critical to meeting the CLCPA requirements.

For example, a typical geothermal system for a 2,500 square foot home in New York will be installed with two 300' boreholes today, whereas in a neighboring state a single 600' borehole can be installed. Current limitations require drilling multiple boreholes for about 80% of Dandelion customers in New York, which adds cost to the installation and causes additional space constraints for denser urban and suburban environments. The Council should recommend that New York establish tailored exemptions and streamlined permitting processes for closed-loop systems deeper than 500 feet, based upon an updated environmental review to account for regional variations in the likelihood of encountering gas pockets in drilling operations. Enhanced depth drilling could reduce installation costs by 10% - 20% and further incentivize residential decarbonization.

Tax and Low-Cost Financing Incentives to Improve Access

3. New York should expand tax incentives to lower overall system costs and support LMI homeowners.

The federal investment tax credits for geothermal heat pump systems are set to decrease from 26% (current) to 22% in 2023 and to expire altogether in 2024. Given the uncertainty regarding continued federal incentives, state tax incentives and utility-provided rebates are even more critical in motivating homeowners to invest in carbon-free heating and cooling systems. The recently enacted New York State income tax credits for homeowners for 25% of the total costs of a geothermal heat pump system (up to \$5,000) provide important support for building decarbonization. Dandelion encourages the Council to endorse further legislative action to update the tax credit to make it refundable to taxpayers who do not have a full \$5,000 in tax liability in a single year, which would increase the impact of the credit. While current carryover provisions allow the credit to be carried across up to five subsequent tax years, making the credit refundable would spur immediate homeowner interest and reduce the complicated accounting burden of tax credit carryover, which can disproportionately exclude LMI households.

The Final Scoping Plan should also endorse legislative action to provide a sales tax exemption for installation costs and the cost of supplies and equipment for ground source heat pumps to reduce overall costs and further incentivize homeowners and building owners to install the most efficient heating systems. These sales tax exemptions for installation, equipment, and supply costs, which have been implemented in other states such as California,⁹ exempt both the homeowner and the construction contractor from sales and use tax. These incentives help mediate the impact of increased industry-wide costs that are currently causing increased prices. Providing these incentives for geothermal systems will help reduce costs and move the industry from hundreds to thousands of installations each year – which is needed to meet the necessary milestones for decarbonizing the building sector.

4. Expanded low-cost finance offerings will be necessary to ensure the benefits of clean, high-efficiency geothermal heating are available to all New Yorkers.

Public and private low-cost loans are critical to ensuring affordability of geothermal energy systems. Most Dandelion customers choose to finance their installation through either state-run loan programs or through low-cost private financing,

⁹ Sales and Use Tax Exclusion, Revenue and Taxation Code Section 6010.8, California Alternative Energy and Advanced Transportation Financing Authority, <https://www.cdtfa.ca.gov/taxes-and-fees/caeafta.htm>

allowing immediate savings from reduced energy costs. Financing options will be critical in ensuring that LMI households and disadvantaged communities are able to access geothermal heating systems where up-front installation costs might otherwise be preventive.

Dandelion supports Key Sector Strategy B5, *Expand Access to Public and Private Low-Cost Financing*, and encourages the Council to include recommendations in the Final Scoping Plan to update the existing NYSERDA Green Jobs Green New York loan program. Reduced interest rate offerings, such as the 0% loan currently offered by the Massachusetts MassSave program, could further incentivize homeowner adoption and investment in energy efficiency improvements. Legislative changes to expand loan eligibility to include energy efficiency improvements as part of new home construction would also offer additional low-cost pathways to decarbonize new buildings.

Regulatory and Building Code Enhancement

5. The Final Scoping Plan should sustain the recommended timelines for adopting all-electric State building codes for new construction to meet the CLCPA requirements.

Dandelion supports inclusion of Key Sector Strategy B1, *Adopt Advanced Codes for Highly Efficient, All-Electric, and Resilient New Construction*, in the Final Scoping Plan. The Draft Scoping plan establishes aggressive timelines for adopting all-electric State codes to prohibit gas/oil equipment for space conditioning, hot water, cooking, and appliances for new construction and additions/alterations in low-rise residential buildings (2024) and buildings over four stories and commercial buildings (2027). These timelines will be essential in meeting the CLCPA requirements.

The legislature should pass and the governor should sign the All-Electric Building Act (S6843C/A8431B) to provide legislative support to these goals; the New York Fire Safety and Building Code Council should further pass building codes that create the same outcome. Enactment of the Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2021 (S7176/A8143A) would further enable building code updates to support building decarbonization. These actions would align New York with

other states such as Washington¹⁰ and California¹¹ which have already taken steps to decarbonize through updates to building codes.

Enactment of an all-electric new building mandate will provide surety in the market and allow Dandelion to take advantage of additional efficiencies and scale our operations to meet increased demand, including the addition of 130-200 new jobs in New York. Dandelion expects that with 18 months notice from enactment of the mandate we could scale our operations to support installing **2,000 geothermal heating and cooling systems in 2024** for new construction residential buildings; we could further increase this new construction business to **3,000 homes per year by 2025**. Given that Dandelion is one of multiple residential geothermal installers in New York, and that there are thousands of air source heat pumps already being installed in New York buildings every year, the overall heat pump industry, geothermal and air source combined, is well-positioned to meet the need for all-electric new buildings in 2024.

6. Zero-emission standards for heating and cooling of existing buildings, coupled with additional incentives, will be necessary to meet the CLCPA requirements.

Key Sector Strategy B2, Adopt Standards for Zero Emissions Equipment and the Energy Performance of Existing Buildings, sets important benchmarks for avoiding new gas connections and decarbonizing existing buildings by replacing heating, cooling, and hot water equipment at the end of their service life with zero-emissions options.

The recommendation to prohibit utilities from providing new gas service to existing buildings starting in 2024 should be coupled with financial incentives to homeowners to enable installation of non-pipe alternative options. For example, National Grid has proposed to offer incentives up to \$13,859 – equal to the avoided costs to the utility for new gas infrastructure – for customers who forgo new gas connections.¹²

Dandelion supports the proposed standards to require zero-emission replacements for heating, cooling, and hot water equipment at the end of its service life in single family homes and residential low-rise buildings by 2030. Dandelion encourages

¹⁰ Gallucci, Maria, “Washington state moves to electrify new buildings by requiring heat pumps,” Canary Media, April 29, 2022, <https://www.canarymedia.com/articles/carbon-free-buildings/washington-state-moves-to-electrify-new-buildings-by-requiring-heat-pumps>.

¹¹ California Energy Commission, “Energy Commission Adopts Updated Building Standards to Improve Efficiency, Reduce Emissions From Homes and Businesses,” August 11, 2021, <https://www.energy.ca.gov/news/2021-08/energy-commission-adopts-updated-building-standards-improve-efficiency-reduce-0>

¹² National Grid: Gas Customer Connection Costs & Electrification Incentives Report, May 12, 2022, Public Service Commission Case 19-G-0309 and 19-G-0310.

the Council to consider a more aggressive timeline of 2028, as the necessary systems and technologies are already in production and available to homeowners.

Workforce Development and Technology

Dandelion appreciates the attention to workforce development and just transition issues in Key Sector Strategy B7, *Invest in Workforce Development*, and encourages the Council to include additional details in the Final Scoping Plan regarding workforce development strategies to drive collaboration between state agencies, utilities, community groups, and industry. Since launching in 2017, Dandelion has created over 200 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. We also work with dozens of subcontractors to best serve our customers and continue to actively hire in all of our markets.

The Draft Scoping Plan projects that building decarbonization will create an additional over 60,000 jobs in the residential HVAC subsector¹³ and recommends investing in a variety of training and resources for the building electrification workforce, including “training and industry partnerships to increase the number of qualified geothermal drillers.”¹⁴ Hiring enough qualified, experienced personnel to complete ground source heat pump installations represents one of the most significant barriers to growth for Dandelion. Dandelion has spent significant effort recruiting licensed drillers and HVAC installers, for example, but there simply aren’t enough licensed professionals to meet customer demand. Workforce development efforts to leverage federal, state, community, and industry training will be critical to growing the necessary workforce.

The Draft Scoping Plan also recommends support for research and development for building decarbonization as part of Key Sector Strategy B9, *Support Innovation*, including support for “continued improvement in cold climate performance across a range of heat pump products and sizes.”¹⁵ The New York Clean Heat and Long Island PSE&G Home Comfort programs should actively partner with industry to incentivize innovations that improve efficiencies and bring down costs to homeowners, including supporting deployment of new types of heat pumps and other system design innovations. Dandelion continues to invest in research and development of new technologies – such as smaller drilling rigs and improved software for sizing geothermal systems – and looks forward to opportunities to partner with NYSERDA, New York

¹³ JTWG 2021 Jobs Study, p. 84.

¹⁴ Draft Scoping Plan, p. 141.

¹⁵ Draft Scoping Plan, p. 144.

State, and other stakeholders to reduce costs and make geothermal heating and cooling more accessible to all New Yorkers.

Health Benefits of Decarbonization

The Draft Scoping Plan highlights the significant health benefits of building decarbonization, estimating \$51-123 billion in air quality benefits through 2050, \$8.7-\$8.9 billion in health benefits from residential energy efficiency improvements, and additional benefits from elimination of indoor gas cooking (not quantified).¹⁶ Appendix F, *Environmental and Health Data for Quantifying Health Benefits of Climate Policy*, further details the health impacts of indoor emission of sulfur dioxide and nitrous oxides, which can pose significant health risks, particularly in children.¹⁷ Appendix F also highlights that benzene levels at all locations across New York currently exceed the state's guideline, with home heating accounting for 15% of the total benzene emissions.¹⁸

Conclusion

Dandelion Energy supports the Draft Scoping Plan, with particular emphasis on the proposed strategies for sustained incentives for residential and commercial building decarbonization, electrification of new building construction, and decarbonization of heating, cooling, and water heating in existing buildings. Dandelion encourages the Council to strengthen the Final Scoping Plan through endorsement of additional legislative, permitting, and regulatory actions which can further reduce greenhouse gas emissions, generate additional savings for New York residents, and sustain New York's leadership in climate action.

Respectfully submitted,



Heather E. Deese
Director, Policy and Regulatory Affairs
Dandelion Energy

¹⁶ Draft Scoping Plan, p. 86.

¹⁷American Lung Association, Nitrogen Dioxide, February 12, 2020, <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/nitrogen-dioxide>

¹⁸ Draft Scoping Plan, Appendix F, p. F-5.