



May 17, 2023

Maddie Koewler
National Association of State Energy Officials
1300 North 17th Street, Suite 1275
Arlington, Virginia 22209

Subject: Home Energy Rebate RFI Response

Thank you for the opportunity to comment on the National Association of State Energy Officials (NASEO) request for information regarding how State Energy Offices (SEOs) can most effectively implement the Home Efficiency and Electrification Rebate programs being established by the U.S. Department of Energy (DOE).¹ Geothermal (Ground Source) Heat Pumps (GSHP) provide significant emissions reductions, grid benefits, and operating cost savings for households in all climate zones across the country, and they represent a key technology for achieving the energy savings goals of the Home Energy Rebate programs.

Summary of Dandelion Energy Comments:

The Home Energy Rebate programs have the potential to help tens of thousands of households to achieve energy and cost savings by making geothermal heat pumps affordable for all Americans. To achieve these benefits, the SEOs should:

- Include rebates for geothermal heat pumps in their programs to ensure that all households have access to long-term energy cost savings through geothermal heating and cooling.
- To maximize the positive impacts of the Inflation Reduction Act, states must pair the Home Energy Rebates alongside state and local-level energy efficiency programs. The federal Home Energy Rebates should supplement existing rebate programs, not replace them.
- Offer the Home Electrification Rebates for both retrofits and new construction.
- Ensure that Home Energy Rebates are available to households who lease their equipment or otherwise sign a contract to electrify their heating and cooling.
- Align implementation plans with existing energy efficiency and grant programs to reduce administrative burdens and duplication.
- Allow flexibility to use historical energy data from a wide variety of sources, including utilities, smart panels and sensors, and third-party data providers.
- Establish categories of pre-approved measures that meet the modeled energy savings requirements under the Home Efficiency Rebate program.

¹ Public Law 117-169, commonly known as the “Inflation Reduction Act,” established the Home Efficiency Rebates program (Section 50121) and the Home Electrification Rebates program (Section 50122).

Background: The Benefits of Geothermal Heating and Cooling Systems

Geothermal heat pumps are among the most efficient ways to heat and cool buildings, according to the EPA.² They are also the lowest cost way for homeowners and businesses to heat and cool their homes. As such, geothermal heat pumps represent a key technology for advancing energy affordability and value, meeting emissions reduction targets, and achieving economy-wide decarbonization without meaningfully increasing peak electric demand.

- Geothermal heat pump systems have the potential to reduce carbon emissions from buildings by more than 40% as compared to methane gas systems, and heat pump emissions will decline to zero as states further decarbonize their electric grids.
- Homeowners can save up to to \$3,000 annually when switching to a geothermal heating and cooling system, factoring in their savings in fuel and air conditioning costs they are no longer paying and the electricity costs to run the heat pump.
- Geothermal heat pumps are about two times as efficient, and use about half the electricity, as an air source heat pump over the course of a year. Geothermal heat pumps will also draw a peak load of only one third of an air source heat pump system.
- Geothermal heat pumps therefore offer significant electric grid benefits, as they decrease summer peaks and don't meaningfully increase winter peaks. A Brattle Group study found that fully electrifying New England using geothermal heat pumps would only minimally impact peak demand and leave energy prices unchanged.³ This is in contrast to technologies like air source heat pumps, which provide electrification benefits, but also increase peak demand.
- Geothermal heat pumps can also meet 100% of the heating needs of a home or building, without any gas or auxiliary electric heat for back-up, even in the coldest climates. This helps further eliminate any infrastructure costs to maintain backup gas systems or install new pipelines.

Category 2: Program Elements

Company Characteristics

16. Name, contact information, company or organization that you represent.

Dandelion Energy, Inc., is one of the nation's leading providers of home geothermal heating and cooling systems; our mission is to provide earth-powered heating for every home. Dandelion Energy point of contact: Doug Presley, dpresley@dandelionenergy.com.

² "Geothermal Heat Pumps," Energy Star, U.S. Environmental Protection Agency, accessed April 20, 2023, https://www.energystar.gov/products/geothermal_heat_pumps

³ Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050, The Brattle Group, p. 30-31, <https://energy.ri.gov/sites/g/files/xkgbur741/files/documents/HST/RI-HST-Final-Pathways-Report-5-27-20.pdf>

17. An overview of your approach to equity, diversity, inclusion, and accessibility (DEIA).

To make the rebates accessible to low- and moderate-income households, the Home Energy Rebates should be available to households who lease their equipment or otherwise sign an energy service contract for electrification of their heating and cooling (in addition to households who purchase their systems outright).⁴ Leasing, energy service contracts, and third-party ownership models provide an important option for ensuring that disadvantaged communities and low- and moderate-income (LMI) households are able to affordably access the benefits of clean heating and cooling. Applying rebates to lease agreements will reduce the overall cost and keep the monthly payments as low as possible for eligible households.

18. As applicable, a short description and a link to programming that your company is contracted or has been contracted to implement for planning, administering, and/or field delivery of federal or state programs. Note which, if any, provides low- and moderate-income and affordable home energy upgrades, especially with and in disadvantaged communities.

Dandelion participates in existing energy efficiency and rebates programs in New York (Clean Heat Program⁵ and the Home Comfort Program⁶), Massachusetts (MassSave⁷), and Connecticut (EnergizeCT⁸), which provide rebates to homeowners for geothermal heat pump installations. Programs typically provide higher value rebates to income-eligible households to further reduce up-front costs and unlock long-term energy savings for low- and moderate-income families. For example, the MassSave whole-home rebate of \$15,000 for a geothermal heat pump increases to \$25,000 for income-eligible families.

Program Elements

19. Describe the program element that is important for State Energy Office consideration. Be as detailed as possible.

Geothermal heat pumps provide long-term annual operating savings in every climate zone compared to fossil-fuel, electric resistance, or air source heat pump heating and cooling – with household energy bill savings ranging from hundreds to thousands of dollars per year. SEOs should include rebates for geothermal heat pumps in their Home Energy Rebate programs in order to ensure that all households have access to long-term energy cost savings through geothermal heating and cooling. This would ensure the programs remain consistent with congressional intent for the Home Electrification Rebates definition of “heat pumps” to include both air source heat pumps and geothermal heat pump systems.

⁴ For example, the New York State tax credit for geothermal heat pump systems includes both purchases and leases in determining the basis for the credit, which include in the categories of eligible equipment “the lease of geothermal energy system equipment under a written agreement that spans at least ten years...”; see New York Tax law section 66, paragraph (g-4), <https://www.nysenate.gov/legislation/laws/TAX/606>, accessed February 2, 2023.

⁵ Up to \$20,000 whole-home or \$2,000/ton rebate; see <https://cleanheat.ny.gov/>

⁶ Up to \$2,000/ton rebate; see <https://www.psegliny.com/saveenergyandmoney/GreenEnergy/Geothermal>

⁷ Up to \$15,000 whole-home rebate or \$2,000/ton partial-home rebate; see <https://www.masssave.com/residential/rebates-and-incentives/ground-source-heat-pumps>

⁸ Up to \$2,000 per ton rebate, see: <https://energizect.com/rebates-incentives/heating-cooling/heat-pumps/ground-source-residential>

Key elements that SEOs should incorporate into their program design to maximize energy savings through geothermal heat pumps include:

- To maximize the positive impacts of the Inflation Reduction Act, states must pair the Home Efficiency and Electrification Rebates alongside state and local-level energy efficiency programs. The Federal Home Energy rebates should supplement existing rebate programs, not replace them.
- SEOs should align implementation plans with existing energy efficiency and grant programs to reduce administrative burdens and duplication and streamline program delivery.
- States should offer the Home Electrification Rebates for both retrofits and new construction, in accordance with the authorizing legislation, which specifically includes purchases “as part of new construction”.⁹ New construction builders have been slow to adopt all-electric building designs, and further incentives are required to transform both the new construction and retrofit markets towards electrification. Providing rebates for both new construction and building retrofits will ensure that all eligible households are able to take advantage of these programs and spur market demand in all construction and retrofit industries.
- Providing up-front certainty in rebate amounts and eligibility is critical for customers and contractors to effectively access rebates. SEOs should take all available steps to maximize contractors’ ability to offer customers set rebate amounts and confirmed eligibility as part of a contract proposal and at point of sale — including through pre-approval of eligible energy-saving measures, supporting aggregators in offering up-front rebates, and flexible income verification systems and processes.
- SEOs should establish pre-approved categories of rebates under the Home Efficiency Rebate program for certain measures based on generic modeled energy savings. Since home heating and cooling accounts for approximately 55% of residential energy use nationwide,¹⁰ geothermal heat pumps are one of a few select measures that will achieve at least 20% to over 35% energy savings in virtually every scenario, regardless of specific housing characteristics. SEOs should establish categories of pre-approved measures that meet these modeled energy savings requirements, including GSHPs for the maximum \$4,000/\$8,000 rebates under the Home Efficiency Rebate program. Pre-approved measures can leverage energy use models and historical weather data, coupled with “Manual J” calculations of the home’s energy use, to be generally consistent with BPI 2400 modeling requirements, using simple inputs to account for climate zones, home size, and age. These select pre-approved measures will provide certainty on rebate values for homeowners, building owners, and contractors, simplify the rebate application process, and reduce duplicative calculation of energy savings.
- SEOs should encourage flexibility for contractors and aggregators to utilize historical energy data from a wide variety of sources, including utilities, in-home smart panels and sensors,

⁹ Inflation Reduction Act (P.L. 117-169) Section 50122(d)(6)(A)(ii)(I).

¹⁰ “Energy Data Facts,” Office of Energy Efficiency and Renewable Energy, DOE, <https://rpsec.energy.gov/energy-data-facts>, accessed May 17, 2023.

third-party data providers, customer utility bills, and/or delivery records. Guidelines should minimize the data required to the minimum elements to ensure eligibility and program compliance, without requiring additional data which can act as a barrier to customer and contractor participation. SEOs should also provide guidance for homes with less than 12 months of utility data (e.g. new homeowners) to ensure these households are not unfairly excluded from these programs.

- States should rely upon existing certifications and training programs as the most effective mechanisms for quality control of heat pump installations. Certifications such as the International Ground-Source Heat Pump Association (IGSHPA) accredited installer certificate or certification as a GeoExchange Designer¹¹ provide robust assurance that geothermal heat pumps are installed in a safe and effective manner, and other existing certifications (such as the Air Conditioning and Heat Pump Professional certification offered by the Building Performance Institute (BPI)¹²) and manufacturer-provided trainings further emphasize appropriate heat pump sizing and installation. Energy efficiency programs such as the MassSave program¹³ and the EnergizeCT program¹⁴ provide an effective model where contractor participants in the Heat Pump Installer Networks must obtain IGSHPA certification for geothermal installers and cold-climate heat pump training for air source heat pump contractors.

- SEOs should leverage common rebate applications, software, and online portals to encourage streamlined program implementation with neighboring states and reduce administrative burdens for contractors operating across multiple jurisdictions. Consistent implementation mechanisms can help increase contractor participation and reduce overhead administrative costs for contractors, ultimately lowering homeowner costs for installed measures.

- Drawing on lessons learned from existing programs, SEOs should streamline rebate processing through technology solutions, such as:
 - Establishing common rebate applications;
 - Leveraging online portals to provide transparency on rebate status for consumers and contractors;
 - Providing software tools to calculate measured and modeled energy savings;
 - Allowing electronic submission of rebates, including electronic signatures, rather than requiring hard copy submissions with wet signatures on documents; and
 - Enabling electronic payments to streamline rebate delivery in addition to offering paper checks when electronic payment is not feasible.

¹¹ See IGSHPA website, <https://igshpa.org/certified-geoexchange-designer/>

¹² See BPI website, <https://www.bpi.org/certified-professionals/ac-heat-pump>

¹³ "Heat Pump Installer Network," MassSave, <https://www.masssave.com/partners/heat-pump-installer-network>

¹⁴ "Heat Pump Installer Network," EnergizeCT, <https://energizect.com/contractor-portal/HPIN>

Conclusion

The Home Energy Rebate programs have the potential to help tens of thousands of households to achieve energy and cost savings by making geothermal heat pumps affordable for all homes. Thank you for your continued work to bring these exciting rebate programs to fruition.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'H. Deese', is centered on the page.

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

Release statement:

Dandelion Energy authorizes NASEO to publish and distribute this response to the NASEO RFI on its website and through other means to the states and general public. We have included no confidential or proprietary information in our response.