



May 19, 2023

**Re: NASEO Request for Information - Implementation Options for Home Energy Performance-Based Whole-House Rebate Program and High-Efficiency Electric Home Rebate Program**

Aeroseal is a climate technology company headquartered in Ohio that uses a proprietary air sealing technology to seal leaks in building ductwork and envelope. Aeroseal's technology was developed at the US Department of Energy (DOE)'s Lawrence Berkeley National Laboratory with partial funding by the DOE and the Environmental Protection Agency. Aeroseal's 970 dealers provide service throughout all 50 states and in each Canadian province. Aeroseal and its contractor network provides envelope and duct-sealing services to existing residential buildings, residential new construction, and existing commercial buildings.

Aeroseal estimates that across commercial and residential buildings in the United States, leaky ducts cost \$3 billion in wasted energy annually. According to EnergyStar, duct sealing alone can address up to 20% in energy savings for households<sup>1</sup>. Aeroseal's unique technology radically lowers duct leakage from homes and commercial buildings thus reducing energy waste, reducing energy costs for consumers, and improving building performance, durability, and health. Compared to traditional, manual methods of duct sealing like tape and mastic, Aeroseal more effectively seals the entire duct system, reliably achieving and average 90% leakage reduction<sup>2</sup> and its results are instantly verifiable. As states look to increase electrification of building end-uses, particularly for low- and moderate-income residents, technologies like Aeroseal become increasingly important to minimize energy loss, maintain affordable energy bills, and ensure resident comfort and acceptance.

Aeroseal appreciates the opportunity to comment and we commend NASEO's leadership to engage vendors, manufacturers, and service providers to support the state energy offices on implementation of these programs.

Aeroseal 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.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Maggie McCarey".

Maggie McCarey  
Head of Policy and Market Development, Aeroseal

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<sup>1</sup> [ENERGY STAR: Benefits of Duct Sealing.](#)

<sup>2</sup> *Building America Case Study Technology Solutions for New and Existing Homes Ducts Sealing Using Injected Spray Sealant.*

## **Category 1: Comprehensive Program Design**

### **Company Characteristics**

1. *Name, contact information, company.*

Maggie McCarey, [maggie.mccarey@aeroseal.com](mailto:maggie.mccarey@aeroseal.com), Aeroseal

3. *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.*

Aeroseal has developed and conducted field delivery (through its dealer network) of advanced duct sealing rebate programs across several states and utility service territories, including Energize [Connecticut](#) and [Puget Sound Energy](#) (PSE). Advanced duct sealing rebate programs incentivize enhanced levels of weatherization to minimize energy loss and ensure greater heating and cooling efficiency. Energize Connecticut offers single-family homeowners a rebate of up to \$1000 for advanced duct sealing, while PSE offers a rebate of up to \$1250. For eligible low- and moderate-income homes, Energize Connecticut covers the entire cost of weatherization upgrades. PSE also offers bonus rebates of \$350 and \$500 to homes that take a whole-home approach and bundle 3+ and 5+ weatherization measures respectively.

### **Program Goals**

4. *How would you describe the goals of this program design? What kind of market transformation are you looking to achieve?*

The primary goal of this program is to seal leaky duct systems to reduce energy usage, greenhouse gas emissions, and energy costs associated with heating and cooling. Ancillary benefits include greater satisfaction with HVAC systems, especially heat pumps, due to increased system efficiency, improved indoor air quality, and resident comfort.

Weatherization is an important energy efficiency upgrade, and is particularly important as a complement to heating system conversions to heat pumps, because it allows more warm or cooled air to be delivered inside the home rather than being wasted. While many states and utilities currently offer incentive programs for weatherization, duct sealing rebate amounts are relatively low and generally incentivize traditional and less effective manual methods such as duct sealing through tape and mastic of easily accessible and visible holes in the ductwork.

Advanced duct sealing uses a water-based sealant formula that is sprayed throughout the entire duct system, filling all cracks and gaps that are in both accessible and inaccessible spaces. This

method delivers an average of 90% reduction in duct leakage<sup>3</sup> and can reduce energy consumption by up to 30%. Additionally, while undertaking advanced duct sealing, installers are measuring results and leakage reduction in real-time. Advanced duct sealing is transitioning the weatherization market by delivering much higher levels of more effective sealing and instantly verifiable results. Aroseal trains and certifies contractors and businesses to participate in this market, including HVAC contractors, insulation installers, home improvement contractors, duct cleaners, and solar installers.

As states look to deploy federal funds, they should use the opportunity to create a rebate of up to \$1600 for weatherization to incentivize homes to adopt advanced duct sealing as allowed by the Inflation Reduction Act.

Advanced duct sealing is especially important in homes that use heat pumps for heating and/or cooling. Heat pumps use significantly more airflow than gas furnaces per BTUH. Because they have lower capacity at the *same* level of airflow, duct leaks will have a larger impact on heat pump systems than gas furnace systems. To ensure equivalent comfort with a heat pump sized for the existing ductwork within a home, ducts must be tightly sealed. As states look to deploy federal funds, they should also identify opportunities to incentivize homeowners to pair complementary measures like advanced duct sealing with heat pump HVAC installation.

5. *Does your program address a specific building type? If yes, which?*

Yes, the program specifically addresses single family and multifamily residential buildings that have heating and/ or cooling systems with ductwork.

6. *Does your program target a particular income level? If yes, which? If not, what income levels can your program effectively reach?*

The two program options referenced above do not target a particular income level but offers lower rebate amounts (\$1250 and \$1000) for market rate customers and higher incentives for eligible low and moderate income customers. Both \$1250 and \$1000 are below the maximum amount permissible for weatherization measures under the HEEHR program. A higher up-front rebate will ensure low and moderate income customers can access this important efficiency measure.

7. *Does your program design address HOMES, HEEHR, or both?*

This program design addresses the HEEHR rebate program. This response address HOMES under Category 2.

8. *Does your program design promote any efficiency or electrification technology in particular? How will you determine which technologies are eligible for rebates?*

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<sup>3</sup> *Building America Case Study Technology Solutions for New and Existing Homes Ducts Sealing Using Injected Spray Sealant.*

This program design promotes advanced duct sealing technologies, e.g. duct sealing using aerosolized materials, to effectively seal ducts and improve heating and cooling system efficiency. These methods also deliver instantly verifiable results.

Any technology that enables significant duct leakage reduction and delivers instantly verifiable results could be considered eligible for rebates.

Additionally, because advanced duct sealing increases the efficiency of heat pumps, pairing these technologies through this program will minimize the energy burden on consumers converting heat pumps, increase resident comfort, and promote effective deployment and adoption of heat pump technologies.

## **Market Conditions**

9. *What market conditions are necessary for your program design to be successful? What policies are necessary? What relationships? (E.g., relationships with utilities, relationships with appliance manufacturers, building envelope technology manufacturers, data access policies, relationships with local and county governments, consumer access to internet, consumer access to big box retailers.) If these conditions are not available, how would a state create them?*

For this program to be successful, a robust network of small contractors trained to deliver advanced duct sealing is required, and such contractors should be easily able to access the program. Aeroseal, for example, has a network of 970 dealers provide services across all 50 states.

Program design should be as streamlined and frictionless as possible. Specifically, Aeroseal recommends that program implementers take the following steps:

1. Ensure timely and complete reimbursement of rebates for contractors;
2. Develop streamlined customer income verification processes;
3. Check for quality assurance using pictures or videos of installations or documentation of leakage reduction rather than in-field inspections, saving time and resources; and
4. Allow contractor qualification for rebate programs on an ongoing or rolling basis so that customers can work with their preferred contractors and new contractors can enter the market to scale the program.

10. *How would building permits and inspections impact the program?*

Aeroseal dealers pressurize the ductwork and measure leakage before, during, and after the advanced duct sealing installation process, thus measuring and verifying results instantly. As a result, with this program, states will be able to ensure compliance with any rating requirements.

## **Implementation Proposal**

11. Describe your vision for implementation in as much detail as possible. Include
- a. A description of the program concept. Who pays whom, when, for doing what (including eligible measures, income strata/customer types, incentive strategies, certification of work completed, contractor training and management, quality assurance, recycling of existing appliances and equipment, and funding leverage)
  - b. A description of the participant journey through the awareness, application, participation, and close out process (including money flows and options for stacking rebates and financing)
  - c. A description of the roles and responsibilities of all parties involved in the process, including the responsibilities of the State Energy Office
  - d. A statement of the benefits and comparative advantages of this program concept (including grid impacts related to electrification, ability or inability to cover a state's entire geography)
  - e. A description of any secondary market implications (e.g., reselling energy savings)

Program concept: The concept of this program is that qualified contractors install advanced duct sealing in single family and multifamily homes. Contractors provide a certificate of verified leakage reduction as documentation of measure installation.

For homeowners and landlords, this is a point of sale rebate - contractors issue an invoice to customers deducting the incentive amount (\$1600 for low-income homes, \$800 for moderate-income homes). Contractors receive the invoiced amount from customers, and then apply directly to the state to receive the rebate amount. Any additional incentives should be determined at this stage to offset the costs and increase the benefits as much as possible for customers with limited income.

Additionally, for homes accessing heat pump HVAC rebates, consider including a mechanism to pair weatherization measures including advanced duct sealing in parallel so the heat pump HVAC system can be appropriately sized and energy loss can be minimized. This could be achieved through bonus incentives or requiring weatherization if accessing the full rebate amount.

Participant journey: Homeowners and landlords should be made aware of advanced duct sealing, its impact potential, the benefits of pairing this measure with heat pumps, and the available incentive through utility and state marketing channels, as well as through home energy audits. Aereoseal will support its local contractors who will also be active participants in selling and providing access to this technology to customers. To the extent that states have specific customer segments or underserved geographies that are priority, Aereoseal can support communication with its contractor network of these priorities. States should consider higher participant and/or contractor incentives in underserved, prioritized communities.

Participants will receive this rebate at the point of sale. Contractors who deliver the program should be able to apply directly to state energy office or its HEEHR implementer to claim the rebate amount. To the extent states have additional energy efficiency funding, stacking these rebates with other weatherization funding for low and moderate income customers to fully cover the cost of advanced duct sealing will improve equitable access and delivery.

Responsibilities of state energy office: The state energy office or its implementer will administer the program and ensure timely reimbursement of contractors. Additionally, the state energy office should coordinate with utilities in the state to ensure this program complements existing utility energy efficiency programs.

Benefits and comparative advantages: The key comparative advantage of this program is that it delivers significantly higher levels of leakage reduction compared to traditional methods. Sealing ducts from the inside will also significantly improve comfort by ensuring that heated and cooled air reach the intended locations of the home.

As the building sector shifts to electrify heating and cooling, weatherization measures like advanced duct sealing will help manage electric load growth by ensuring that heat pumps perform to their designed efficiency levels. Additionally, weatherization measures like advanced duct sealing will help with customer satisfaction and acceptance of the technology by minimizing bill impacts and improving comfort in the home. Finally, this is a program that can be rolled out across almost all states as it has wide applicability across all single family and multifamily homes with duct-based heating/ cooling systems, and a growing delivery network of trained installers.

### **Types of Implementation Partners**

- 12. Types of partners, businesses or other entities will be necessary for program implementation (Do not specify a third-party name. NASEO may delete your entire submission if a specific third party name is included).*

Key partners or businesses necessary for program implementation are trained contractors that offer insulation and other home energy upgrade services. AeroSeal has a robust contractor network of almost 1,000 contractors across the country qualified and trained to deliver advanced duct sealing.

## **Category 2: Program Elements**

### **Company Characteristics**

16. *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.*

As detailed above, Aereoseal has developed and conducted field delivery (through its dealer network) of advanced duct sealing programs. Advanced duct sealing rebate programs incentivize enhanced levels of duct sealing compared to traditional methods of duct sealing thereby reducing energy consumption by up to 30%.

[Connecticut](#) offers single-family homeowners a rebate of up to \$1000 for advanced duct sealing while [PSE](#) offers a rebate of up to \$1250. For low- and moderate-income homes, Connecticut covers the entire cost of weatherization upgrades. PSE also offers bonus rebates of \$350 and \$500 to homes that take a whole-home approach and bundle 3+ and 5+ weatherization measures respectively.

As states look to deploy federal funds, they should include advanced duct sealing as an eligible measure in their performance-based HOMES programs. Advanced duct sealing can be included as part of a bundle of measures within a modeled or measured energy savings program to help achieve deeper levels of whole home energy savings.

### **Program Elements**

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

Three key program elements are important for State Energy Offices to consider:

1. Ensuring that homeowners and landlords get expert advice on home efficiency and electrification upgrades, what measures are best suited for their homes, and how best to stack federal, state, and utility incentives to deliver maximum energy savings and benefits. States should ensure implementers establish partnerships with local organizations and/or contractors that are best positioned for engaging residents in underserved communities.
2. Ensuring that homeowners and landlords use federal funds to implement deep energy savings measures that deliver high levels of energy savings and GHG emissions reductions, such as advanced duct sealing. For this, states should require that certain minimum levels of insulation and leakage reduction are achieved for weatherization upgrades to qualify for the HOMES rebate.

3. Encouraging homeowners and landlords to pair complementary measures such as weatherization and heat pump installations. States should consider bonus incentives or incentive adders for homes and buildings that undertake advanced duct sealing and other weatherization measures in conjunction with heat pump HVAC installation.