

Abode Energy Management

Thank you for the opportunity to provide comments. We commend you on the thoughtful process and program design.

Abode Energy Management (Abode) believes that weatherization should always be a prerequisite to heat pump adoption however, as a lead vendor in the Massachusetts Mass Save program, we understand firsthand the complication and administrative burden that requiring weatherization can impose on a program. Therefore, since this is a pilot program, we recommend that OER provide an add-on incentive for weatherization work that is done within a window of the heat pump project date. Layered on top of the utility incentive, this should ensure weatherization is an incorporated measure during the HEA and incentive homeowners further to follow through.

Right-sizing equipment is the biggest challenge we see with contractors and is critical to ensuring homeowner comfort and system efficiency. Manual J requirements would be overly burdensome to the program, and most likely would be of varying accuracy. We see that the program will include a level of quality assurance, but this is often post-installation and so won't ensure that systems aren't oversized. Abode has conducted over 800 pre- and post-quality assurance reviews on projects in for Municipal Light Plants in Massachusetts and believes that in a nascent program such as this, program dollars can be better spent on contractor engagement and education or providing a sizing review prior to installation.

We support the recommendation for homeowners to get 3 quotes but would not support making that a program requirement as that becomes a roadblock for some customers to move forward. We would like to emphasize the need to support homeowners to compare quotes for cost, efficiency, sizing, and environmental impact. As quotes are often undecipherable to the average homeowner, additional assistance may be required. We have also seen a recent trend for contractors to resist giving written quotes without homeowner commitment, and in some cases even charging for quotes.

As the program does not have a dedicated budget for education and homeowner support, we would like to reiterate the importance and need for these mechanisms in the marketplace. Empowering homeowners not only increases adoption and reduces the sales cycle time but increases the likelihood that systems will have a higher utilization rate and proper usage.

August 31, 2022

Chris Kearns
Interim Commissioner
Rhode Island Office of Energy Resources
1 Capitol Hill, 4th Floor
Providence, RI 02908

Re: High-Efficiency Heat Pump Program (HHPP) Design

[Acadia Center](#) is a non-profit, research and advocacy organization committed to advancing the clean energy future by offering real-world solutions to the climate crisis. Acadia Center tackles complex problems, identifies clear recommendations for reforms, and advocates to create significant change that supports a low-carbon economy across the Northeast which can then be a model for application elsewhere. Acadia Center identifies regional, state, and local improvements to dramatically reduce carbon pollution and improve quality of life.

As the Rhode Island Act on Climate requires the state to significantly reduce economy-wide greenhouse gas (GHG) emissions, it is imperative the state prioritize the transition to non-emitting space and water conditioning appliances. Acadia Center [testified in strong support](#) of this targeted investment included in the McKee Administration's FY 2023 budget proposal and appreciates the opportunity to supplement its [April 2022 Comments](#) to the Office of Energy Resources (OER) Request for Information on development of heat pump incentives.

Focus on Efficiency: Questions Posed for Public Comment

Should This Incentive Require Weatherization?

Weatherization is critical to ensure the proper sizing and operation of heat pump systems. As such, the program resulting from this RFI should require energy assessments and all feasible attempts to weatherize the space before design/installation of the system is complete. Notwithstanding that preferred sequence, the program administrator should provide flexibility in those limited cases where heat pumps can be installed in the near-term but weatherization may require an extended timeline due to supply chain or workforce challenges. Where pre-weatherization or pre-electrification barriers arise, this program should be designed to leverage all available resources to overcome those barriers and enable the most efficient heat pump system operation possible.

Attempts to weatherize or electrify within existing programs too often succumb to these barriers, particularly in older housing units that contain asbestos, lead paint, and outdated wiring. These residences also tend to be located in overburdened and underserved communities and home to families facing the most dire of health, safety, and climate consequences of fossil fuel combustion. The HHPP is an opportunity to break through the status quo and envision a new framework that focuses on delivering the myriad benefits of energy efficiency and electrification to those who need it the most. For more on this approach, please consult Acadia Center's [Next Generation Energy Efficiency](#) vision.¹

¹ <https://acadiacenter.org/resource/next-generation-energy-efficiency-brief/>

What Mechanisms Can Be Included to Ensure All Rebate-Eligible Equipment is Right-Sized?

In cases where weatherization and other energy efficiency improvements cannot be accomplished prior to right-sized heat pump installation, this program could support additional temporary measures to support the ability of a system to heat and cool an untreated building. Such measures could include temporary supplemental heating from loaned electric space heaters, dehumidifiers, and electric bill credits to offset the additional consumption of those supplemental devices until such time as weatherization measures can be completed. This is particularly important in cases where an electric heat pump system will be replacing a failed or failing fossil fuel appliance, thus avoiding ongoing maintenance or replacement costs related to that fossil fuel unit.

High-Efficiency Heat Pump (HHPP) Program Design and Implementation

Prioritize Investments Serving Disadvantaged Communities

Acadia Center supports OER's proposal to follow the federal Justice 40 Initiative to direct "40% of the overall benefits of certain Federal investments—including investments in clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of clean water infrastructure—to flow to disadvantaged communities." The Justice 40 Initiative, while an historic policy goal, should be viewed as a baseline standard and Acadia Center urges OER and the McKee Administration to design and implement the HHPP and other program opportunities to go far beyond the 40 percent minimum goal.

In addition to increasing the baseline goals of the Justice 40 Initiative, Acadia Center urges OER and other government agencies to examine opportunities to expand the eligibility of "Disadvantaged Communities" by looking at other local criteria that may not be captured in the federal guidelines promulgated by the Department of Energy. For instance, while the federal guidelines include a number of indicators for outdoor air quality, OER and the Rhode Island Department of Health should jointly identify households in Rhode Island suffering from detrimental indoor air quality resulting from fossil fuel combustion and/or thermal comfort safety concerns and strategically prioritize enhanced investments in weatherization and electrification to yield improved health outcomes.

Additional consideration should be given to eligible customers living in areas of Rhode Island with identified gas infrastructure challenges—weatherization and electrification is an opportunity to avoid new ratepayer costs for unnecessary gas infrastructure buildout and pipe replacement or even to aid in pruning back the existing gas distribution network in furtherance of the Act on Climate's GHG emissions reduction mandates.

Support for Zero-Interest Financing and Streamlined Processes

Acadia Center strongly supports the proposal to offer zero-interest financing opportunities for up to 15 years. The process should be as streamlined as possible and place little to no additional administrative burden upon the customer than is necessary. This should include coordination by the program administrator to leverage all existing energy efficiency and electrification incentive opportunities, manufacturer rebates, as well as lowering barriers to participate in the existing zero-interest HEAT loan program to finance customer contributions to the projects. One opportunity to streamline this process is to remove any "up-front" payments required by the customer which are ultimately offset by rebates. For example, if a contractor requires a \$2,500 deposit for a system installation that then

qualifies for a \$2,500 program rebate upon completion, this is an opportunity to lower initial barriers for customers. The program administrator could also explore on-bill utility financing opportunities in addition to existing offerings.

Expand Eligibility Beyond Fossil Fuel Customers; Full Eligibility for Utility Gas Customers

Acadia Center appreciates OER's focus on providing electrification support to current users of fossil fuels—particularly the proposal to require electric heat pump systems be sized to fully serve a building's heating and cooling needs. To the extent customers who primarily burn wood for heat are not covered by other existing incentives and offerings, Acadia Center recommends extending the HHPP eligibility to cover those buildings as well to ensure all Rhode Islanders can access support for transitioning to electric heat pump systems. Like fossil fuels, burning wood can contribute to GHG emissions, indoor air quality concerns, and health and safety concerns.

Similarly, the program draft states customer eligibility for the residential enhanced incentive extends to “customers of Rhode Island utility companies currently using oil or propane for heating.”² The enhanced incentive should also be available for customers currently using fossil gas for heating as well, as electric heat pumps are at least three times as energy efficient as gas furnaces and have the ability to significantly improve thermal comfort throughout all seasons.

Additional Considerations

Coordinate to Phase Out Incentives for Less Efficient and Versatile Technologies

To maximize this initiative's impact, Acadia Center recommends OER coordinate the HHPP with efforts in other state programs to phase out and eliminate incentives for fossil-fuel burning appliances and cooling-only systems offered elsewhere, including through the energy efficiency programs. The difference in costs between installing or replacing a central cooling system and the costs of installing a central heat pump system is negligible and Rhode Island should be looking to central cooling installations as a natural intervention point to instead encourage and require installations of more versatile heat pump systems.

Program Administrator Considerations

Acadia Center recognizes the success of Rhode Island's current energy efficiency programs in driving energy savings in several categories while falling short in others. With proper program guidance and ambition, the program administrator of those programs could be successful in operating a more robust heat pump adoption program. Acadia Center also recognizes, however, that the current energy efficiency program administrator is also incentivized by the utility business model to drive new customer growth in the gas distribution system. This has and will continue to represent a barrier in driving heat pump adoption towards customers the Company may view as potential new gas customers.

Absent a voluntary initiative from the current utility to actively steer customers away from new fossil gas connections, complementary policies could help correct these conflicting business models. For instance, legislation or regulations that disincentivize or better yet, prohibit, new gas connections would help accelerate adoption of electric heat pumps. Redirecting incentives currently offered for new fossil fuel equipment would be another way to generate supplemental funds for weatherization and electrification. Electric heat pumps and heat pump water heaters

² [HHPP Proposed Program Design](#), pg. 7.

are significantly more energy efficient and safer than fossil fuel equipment and, as the electric grid continually decarbonizes, are the only technology that is net zero ready.

Despite this clear difference in technology and emissions impacts, Rhode Island Energy is currently offering customers incentives for new long-lived fossil fuel equipment and actively marketing new connections to the gas distribution system using outdated, incomplete, and misleading information.³ All of these fossil fuel-based systems would be long-lived and providing additional incentives to customers to prolong the use of fossil fuels is inconsistent with the Act on Climate and the benefits being advanced by the HHPP.

A third-party administrator focused primarily or exclusively on transforming the heating sector to non-emitting technologies could potentially achieve greater results and Acadia Center urges OER to consider alternatives to the utility before moving forward. Having an independent, community-based initiative lead these efforts could accelerate deployment of heat pump systems in housing where it would be particularly beneficial for health and safety purposes. Additionally, entities like the Rhode Island Infrastructure Bank could help leverage additional sources of funding and financing, particularly on larger scale projects that may be eligible for the Community Incentive. For more information on realigning the utility business model, please consult Acadia Center's [RESPECT](#) (Reforming Energy System Planning for Equity and Climate Transformation) proposal.⁴

Workforce Development

Robust Partnerships to Spread Training Opportunities

Ideal organizations and entities for training programs include existing and new vocational programs in Rhode Island's secondary and post-secondary schools, trade and labor unions, and relevant trade associations. Additionally, training programs that provide skills and experience to incarcerated and justice-impacted Rhode Islanders should be adapted/enhanced to include robust instruction on electric heat pump design and installation. Rhode Island should prioritize opportunities for those living in overburdened and underserved communities to pursue careers in this field to ensure everyone has access to the benefits of a clean energy economy. Equipment manufacturers have developed innovative heat pump training education programs, including the use of mobile training centers⁵ to meet installers and technicians in the communities they serve. The Office of Energy Resources and all partners should work to attract and publicize those training opportunities to Rhode Island, including hosting any mobile training infrastructure in the communities that would benefit most from heating electrification.

³ <https://www.rienergy.com/RI-Home/Convert-to-Natural-Gas/>

⁴ <https://acadiacenter.org/resource/respect-reforming-energy-system-planning-for-equity-and-climate-transformation/>

⁵ <https://www.achrnews.com/articles/142735-samsung-hvac-training-goes-on-the-road-with-mobile-training-truck>

Incentivizing Contractors to Strategically Upskill the Workforce

Contractors should seize any opportunity provided to them to reinforce or supplement their existing workforce by adding the skill base necessary to design/install heat pump systems. As the HVAC industry transitions away from fossil fuel-based equipment, it may be appropriate for entities to focus training for electric heat pumps design/installation/maintenance/repair on new entrants to the workforce, mid-career HVAC technicians, and supervisory employees with the understanding that technicians closer to the end of their careers will still have significant amounts of fossil-fuel HVAC systems to service and maintain over the coming decades. Ideally, there will be more than enough work related to heating electrification and related technologies to sustain new entrants to the field which may obviate the need for them to also train in legacy fossil fuel HVAC equipment. The Office of Energy Resources should work directly with the Department of Labor and Training, industry, and labor groups to identify the best pathways to ensure a just transition for workers in the legacy fuel industries.

Additionally, Rhode Island should establish an all-electric building code for new construction and major renovations, which would further incentivize the HVAC industry to develop skills necessary to meet future building energy needs.

Miscellaneous Recommendations

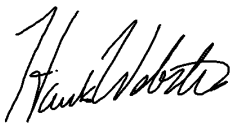
- Acadia Center recommends OER extend eligibility, or clarify the program design, to reflect the \$750/ton rebate for high-efficiency heat pumps in new homes should include additions to homes and/or newly constructed auxiliary dwelling units (ADUs). As Rhode Island seeks to address housing shortages and policy support for ADUs grows, ensuring access to these incentives should be a top priority to avoid new long-lived fossil infrastructure.
- Regarding the customer process, Acadia Center reiterates its recommendations to streamline the experience as much as possible. While the program envisions a turnaround of 4-6 weeks for equipment installed in new homes, the turnaround grows to 8-10 weeks for installations in existing buildings. Every effort should be made to align these timeframes and, to the extent possible, accelerate the provision of rebates back to customers. Beyond accelerated rebate timelines, OER and the program administrator should identify opportunities to reduce up front deposits for contracted work, including the possibility that a customer could sign over the rebate to the contractor in lieu of making an up-front financial payment to be held by the contractor. This flexibility, coupled with the access to zero interest loans, can make electrification more attainable for customers, particularly those facing an emergency replacement of their current fossil fuel burning equipment on a timeline that may not facilitate a significant down payment.
- Workforce development activities should be coordinated with technical school curriculum to ensure students are exposed to the growing opportunities within the decarbonized HVAC field. Development efforts should also be coordinated with local labor unions to strategically allocate training resources among workers at various points in their careers. Special emphasis should be given to trainings for Ground-Source Heat Pump design, particularly in new construction where buildings can be more easily designed and connected to GSHPs.

- Consumer education efforts should emphasize proper operational settings for heat pump systems, including but not limited to using the right space conditioning modes to achieve the greatest energy savings and comfort, the value of filter cleaning and replacements, troubleshooting, and maintenance.
- Acadia Center generally supports the incentive levels proposed by OER and recommends the state consider additional or bonus incentives for full displacement and removal of on-site fossil fuel combustion and any associated connections to the fossil gas distribution network.

Conclusion

Acadia Center appreciates the opportunity to provide comments to OER in support of its efforts to accelerate electric heat pump adoption in Rhode Island. Acadia Center strongly supports these efforts to reduce greenhouse gas emissions, improve public health, elevate the quality and safety of our buildings, and insulate Rhode Islanders from the extreme volatility of fossil fuel pricing. We look forward to continuing our work with OER and other state agencies to advance the clean energy future.

Sincerely,



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Aquidneck Services

To whom it may concern,

We believe this program is essential in the growth of this sector and in meeting the energy goals of Rhode Island. As a contractor in this space we find the largest problem is the cumbersome nature of the HEA process. The round trip on the process as it stands now is about 2 months before we can begin our process with the end user. This will likely double if not triple if something is not done before this rolls out. The STRICTLY suggestive nature of those appointments with the work not being required (just the appointment) seems redundant and it gets in our way to efficiently serve customers. We feel these two entities should be separate in this process, we do not discredit the validity of what's being done on that end. I speak from personal experience having gone through the process at my own home, and having all recommended work being done by an incredible local insulation contractor. Option B would be initializing another entity or entities other than Rise Engineering (or incentivizing Rise to grow to handle demand) to aid in the demand this program is going to create, allowing the process to happen in a shorter period of time that not only will be more attractive to homeowners but allow HVAC contractors to complete work in a timely manner.

The implementation of this program must also be public knowledge no later than Jan 31st 2023. We cannot be held hostage with the promise of a new program and planned rebate amounts. This past year the program was not made official until APRIL. Installs do carry year round but Heat Pumps primarily install in March, April, May and June. While its released retroactive to Jan 1, attempting to sell work not knowing and not being able to assure customers incentives will 100% be available is not conducive to what we do. Massachusetts while not perfect has done well with how its managed through Mass Save and their administrators. Let's not squander this opportunity. Thank-you.

Dandelion Energy

Please see attached comments.



August 30, 2022

Submitted Online
Rhode Island Office of Energy Resources (OER)
One Capitol Hill
Providence, RI 02908

Subject: Comments on the Program Design for the High-Efficiency Heat Pump Program

Thank you for the opportunity to comment on the proposed program design for the High-Efficiency Heat Pump Program (HHPP). 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, also known as ground source heat pumps, so inexpensive and easy to install that we enable a widespread shift from fossil heating to renewables. The incentives proposed by the HHPP will be an important step towards building decarbonization, and the higher geothermal rate in the proposed Community Incentive provides a good model for the rest of the HHPP program. To fully meeting the emission reduction goals of the Act on Climate,¹ however, will require enhanced and sustained incentives over many years to fully eliminate fossil fuel use in Rhode Island homes.

Summary of Dandelion Energy Comments:

1. Rhode Island should set the incentive for geothermal heat pumps to \$2,500 per heating ton to account for the system-wide benefits and align with other states in the region. This would be consistent with the HHPP Community Incentive which provides a significantly higher rate for geothermal rebates of \$4,500 per ton.
2. Rhode Island should update the HHPP program structure to provide incentives based on heating capacity rather than cooling capacity.
3. The HHPP should encourage weatherization as a complement to beneficial electrification, but should not make it a mandatory requirement, as doing so can deter homeowners from installing heat pumps.
4. The full HHPP residential incentive should be available for new construction as well as retrofits.
5. The Enhanced Incentive should be expanded to include geothermal heat pumps, which offer the lowest long-term operating costs of any heating and cooling system.

¹ Rhode Island 2021 Act on Climate, April 14, 2021, <https://climatechange.ri.gov/act-climate>

6. The Enhanced Incentive should be expanded to cover beneficial electrification for current natural gas customers, particularly given the negative health consequences of fossil fuel combustion inside homes.
7. Verifying contractor certifications and procedures provides the most effective and efficient mechanism to ensure system sizing and program compliance.
8. Dandelion supports the proposed funding for workforce training and development, as workforce availability will be a significant factor in determining the success of building electrification.
9. Achieving emissions reduction goals will require sustained support for building electrification, and Rhode Island should sustain the HHPP incentives through utility energy efficiency programs following HHPP completion.

Full Comments and Recommendations:

Background: The Benefits of Geothermal Heating and Cooling Systems

Geothermal heat pump systems have a critical role to play in decarbonizing the building sector and transitioning to an economy run on clean energy, as geothermal is among the **most efficient** ways to heat and cool buildings, according to the U.S. Environmental Protection Agency.² Geothermal heat pump systems also **offer the lowest operating costs of any heating or cooling technology**. Geothermal customers will typically use 40 to 50% less electricity than an air source heat pump for a similar home, with peak summer and winter loads up to 75 to 80% lower, and have the potential to reduce carbon emissions from Rhode Island homes by up to 80% as compared to fuel oil systems and 40% as compared to natural gas systems.³ These emissions reductions will grow over time as Rhode Island continues to decarbonize its electricity generation.

A study by the Brattle Group on *Heating Sector Transformation in Rhode Island* found that the notional scenario of fully electrifying Rhode Island homes and commercial buildings using geothermal heat pumps provided the lowest annual energy costs of any modeled scenarios. The mixed-fuel adoption scenario **modeled geothermal heat pumps installed in 33% of buildings**, with geothermal providing the lowest operating cost compared to fuel oil or gas customers.⁴

Geothermal heat pumps also **offer significant electric grid benefits**; they increase baseload demand, decrease summer peaks, and don't meaningfully increase winter peaks.

² "Geothermal Heat Pumps," Energy Star, U.S. Environmental Protection Agency, accessed August 29, 2022, https://www.energystar.gov/products/geothermal_heat_pumps

³ Savings calculated by Dandelion and available on our website: <https://dandelionenergy.com/environmental-impact>

⁴ The Brattle Group, *Heating Sector Transformation in Rhode Island: Pathways to Decarbonization by 2050*, Pages 38-49, <https://www.brattle.com/reports/heating-sector-transformation-in-rhode-island>

The Brattle Group study found that fully electrifying New England using geothermal heat pumps would only minimally impact peak demand and leave energy prices unchanged.⁵ This is in contrast to technologies like air source heat pumps, which provide electrification benefits, but also increase peak demand. Analysis conducted for the New York State Climate Action Council models the geothermal heat pump industry growing to represent **23% of all heat pump installations**; further sensitivity analysis found that if geothermal and district heating systems increased to represent 80% of all installed heating systems by 2045 (compared to the 23% baseline), it would yield over **\$10 billion in additional net benefits**. This included a 2.8% decrease in annual electric loads and **a 10.8% decrease in peak electric loads**, generating significant savings in avoided electric infrastructure costs.⁶

The increased baseload demand provided by geothermal heat pumps also generates additional savings for other electric rate-payers – a study by the New York State Energy Research and Development Authority estimated the value of this cost shift to be over \$7,000 for each single family home electrified with geothermal heat pumps.⁷ Geothermal heat pumps increase electric demand without increasing electric peak demand or requiring new electric grid infrastructure. The additional revenues for utilities are significantly greater than the additional costs of the electric generation; for regulated utilities that do not earn profit on electric consumption charges, this surplus is then returned to customers through lower electricity rates for all rate-payers. Geothermal systems therefore have the added benefit of effectively **underwriting the electric usage of other electric customers and reducing overall costs for all consumers**. This is in contrast to other renewable technologies which can reduce overall grid demand and leave other rate-payers, particularly low- and moderate-income households, footing the infrastructure bill to sustain the grid.

Given these benefits, 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. While emissions reductions are significant and operating costs are low, the up-front installation cost of geothermal presents a barrier to homeowners and landlords. Utility, state, and federal incentives can help defray this up-front cost, allowing as many households as possible to benefit from the lower energy bills and healthier home environment with geothermal.

While the proposed HHPP rebates represent positive steps towards encouraging customers to decarbonize, Rhode Island can, and should, do more to encourage adoption of geothermal heat pumps through increased HHPP incentives and sustained utility funding in support of beneficial electrification programs.

⁵ Ibid, . p. 30-31.

⁶ New York State Climate Action Council Draft Scoping Plan, Appendix G, Integration Analysis Technical Supplement, p. 80, December 2021.

⁷ New Efficiency: New York, Analysis of Residential Heat Pump Potential and Economics, New York State Energy Research and Development Authority, January 2019, p., S-3,
<https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/NYSERDA/18-44-HeatPump.pdf>

- 1. Rhode Island should set the incentive for geothermal heat pumps to \$2,500 per heating ton to account for the system-wide benefits and align with other states in the region. This would be consistent with the HHPP Community Incentive which provides a significantly higher rate for geothermal rebates of \$4,500 per ton.**

The proposed HHPP rebates of \$1,250 per cooling ton are below that of other states in the region, and do not properly incentivize geothermal heat pumps for their system-wide benefits as compared to other heating and cooling electrification measures. States such as New York, Connecticut, Massachusetts, and Vermont offer rebates of \$1,500 to \$5,000 per ton, and incentivize geothermal systems at a significantly higher rate than air source heat pump systems:

	Residential Geothermal Rebate	GSHP Compared to ASHP
New York⁸	\$1,500 - \$5,000 / heating ton*	+50% to 100% higher
Massachusetts⁹	\$15,000 whole home, \$2,000/ cooling ton	+50% higher
Vermont¹⁰	\$2,100 / heating ton	+ 400% higher
Rhode Island HHPP	\$1,250 / cooling ton	0%

*equivalent to \$1,200 - \$4,000 / cooling ton

The proposed HHPP Community Incentive reflects this system-wide value with a significantly higher geothermal rebate of \$4,500 per ton, and the Residential Incentive should be similarly increased to reflect the value and efficiency of geothermal heating and cooling.

- 2. Rhode Island should update the HHPP program structure to provide incentives based on heating capacity rather than cooling capacity.**

The heating and cooling capacity of heat pumps and HVAC systems are measured in “tons,” which typically represent 12,000 BTU/hour of cooling capacity or 10,000 BTU/hour of heating capacity. Most heat pumps and HVAC systems have higher cooling capacity than heating capacity, but the ratio between them varies across heat pump makes and models. Rhode Island is a heating dominated climate, with winter heating requiring a significantly greater proportion of overall energy usage than summer cooling – yet Rhode Island Energy currently

⁸ NYS Clean Heat Statewide Heat Pump Program, tons are measured in 10,000 BTU/h of heating capacity, <https://saveenergy.ny.gov/NYS-Clean-Heat/assets/pdf/NYS-Clean-Heat-Program-Manual.pdf>

⁹ MassSave residential rebates, <https://www.masssave.com/en/saving/residential-rebates>

¹⁰ Efficiency Vermont Residential rebates, tons are measured in 12,000 BTU/h of heating capacity, <https://www.efficiencyvermont.com/rebates/list?type=Residential>

measures capacity for rebates using cooling tons. Other energy efficiency programs in the region have already transitioned from legacy air conditioner-based programs to heating-based rebates: the New York Clean Heat program transitioned in early 2020, Long Island transitioned air source heat pump rebates in 2021 and is actively considering doing the same for geothermal rebates, and Massachusetts and Connecticut are considering moving to heating-based rebates as well. As Rhode Island decarbonizes the building sector, transitioning rebates to a heating capacity basis early in the program will help align rebates with their energy savings impact and ensure that the most efficient heating systems are properly incentivized.

3. The HHPP should encourage weatherization as a complement to beneficial electrification, but should not make it a mandatory requirement, as doing so can deter homeowners from installing heat pumps.

Weatherization programs provide an important complement to beneficial electrification, helping to lower overall heating and cooling loads in building retrofits. However, making weatherization a prerequisite for electrification of heating and cooling can act as a deterrent for many homeowners, who may not have the time, interest, or funding to undertake multiple home improvement projects at the same time. This can result in homeowners deciding not to take the single-most impactful measure – upgrading their heating and cooling system – or not implementing any efficiency measures at all. States such as New York, Vermont, and Maine have all recognized the importance of allowing consumers to weatherize and electrify at their own pace, while taking steps to educate and encourage homeowners to take as many weatherization and electrification steps as they can. States such as Massachusetts have incentivized weatherization in conjunction with heat pump installation by providing the higher whole-home incentive only for weatherized homes, while still offering a substantial \$2,000 per ton partial home incentive for homes that are not yet weatherized.

The federal tax credits for weatherization and electrification in the recently-passed Inflation Reduction Act also establish annual maximum credit amounts of \$1,200 for weatherization improvements. This annual cap will likely incentivize homeowners to spread out their weatherization upgrades over multiple years to maximize the federal tax incentives. Requiring completion of weatherization before heat pump installation could therefore significantly delay building decarbonization under the HHPP.

As Rhode Island looks to incentivize the co-delivery of heat pumps with supportive weatherization measures, Dandelion strongly encourages it to take an approach that encourages homeowners to weatherize while still allowing for stand-alone heat pump installation. This approach recognizes the savings potential of individual measures and provides flexibility to homeowners.

4. The full HHPP residential incentive should be available for new construction as well as retrofits.

New construction is the optimal time to install a geothermal system to minimize disruption and reduce overall costs, yet builders and developers do not benefit from the long-term operating cost savings from selecting the most efficient equipment. Home buyers often have less visibility into the long-term potential savings during the homebuying process, creating a potential mismatch between short-term incentives for builders and long-term health benefits and cost savings for homeowners.

States such as New York, Illinois, and Vermont offer full-value prescriptive rebates for geothermal heat pumps in new construction, which provides a strong incentive for builders to electrify new home construction and avoid installation of fossil fuel equipment and infrastructure. Given long-term natural gas price uncertainty and broader policy trends, fossil fuel burning equipment installed today may also need to be replaced before the end of its useful service life. Gas price volatility, gas infrastructure supply constraints, and future building code updates and legislation can all impact the future availability of natural gas, potentially leaving homeowners with the cost burden of a stranded asset in their otherwise modern and efficient home. Decisions made by home builders today will lock-in energy usage for many decades to come, and **extending the full value of the HHPP residential rebate to new construction** would greatly support the electrification of new buildings in Rhode Island while minimizing potential costs and disruption due to future retrofits.

5. The Enhanced Incentive should be expanded to include geothermal heat pumps, which offer the lowest long-term operating costs of any heating and cooling system.

Geothermal heat pump systems offer the lowest operating cost of any heating or cooling technology. This cost savings advantage is even more important for low-income households and those in disadvantaged communities, and the HHPP should ensure that geothermal systems are not excluded from the Enhanced Incentive offerings. Determining the optimal heating and cooling solution for a home requires a tailored assessment of factors unique to that house and environment, and program implementation staff should be free to recommend low-operating-cost geothermal systems as an Enhanced Incentive measure when the situation warrants. The federal Inflation Reduction Act includes rebates of up to \$8,000 for heat pumps for low- and moderate-income households under the High-Efficiency Electric Home Rebate Program; when coupled with the HHPP Enhanced Incentive, these rebates will make geothermal systems affordable and accessible to many moderate income families who could benefit the most from the low operating cost of geothermal heat pumps.

6. The Enhanced Incentive should be expanded to cover beneficial electrification for current natural gas customers, particularly given the negative health consequences of fossil fuel combustion inside homes.

As currently proposed, the HHPH Enhanced incentive is only available to fuel oil and propane customers, excluding low-income and disadvantaged communities from the health benefits of replacing natural gas with electric alternatives. Indoor combustion of methane gas can create nitrous oxides, which have been found to pose significant health risks, particularly in children.¹¹ A recent study in Boston also found that natural gas used in homes contains “varying levels of volatile organic chemicals that when leaked are known to be toxic, linked to cancer, and can form secondary health-damaging pollutants such as particulate matter and ozone.”¹² Rhode Island should expand the Enhanced Incentive to include natural gas customers to ensure they are eligible to share in the health benefits of decarbonizing their homes.

7. Verifying contractor certifications and procedures provides the most effective and efficient mechanism to ensure system sizing and program compliance.

The proposed program design for the HHPH solicits public feedback on methods to ensure that all rebate-eligible equipment is “right-sized.” In states where Dandelion operates, programs often leverage existing contractor certifications and compliance with industry standards to ensure appropriate system sizing. In some programs, new contractors may receive specific reviews of submitted projects to verify sizing procedures and best-practices. Relying on industry best practices avoids unnecessary overhead costs to verify program compliance and streamlines program delivery. Attempting to independently assess system sizing for all systems would increase the administrative burden of the program, leading to rebate delays and lower homeowner and contractor satisfaction. Rhode Island should ensure that contractor certifications and procedures are verified as a requirement for program participation to optimize program delivery at the lowest overhead cost.

8. Dandelion supports the proposed funding for workforce training and development, as workforce availability will be a significant factor in determining the success of building electrification.

Dandelion appreciates the attention to workforce development under the HHPH. 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 25-50 jobs per warehouse. We also work with

¹¹American Lung Association, Nitrogen Dioxide, February 12, 2020, <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/nitrogen-dioxide>

¹²“Natural Gas Used in Homes Contains Hazardous Air Pollutants,” Harvard T.H. Chan School of Public Health, June 28, 2022, <https://www.hsph.harvard.edu/c-change/news/natural-gas-used-in-homes/>

dozens of subcontractors to best serve our customers and continue to actively hire in all of our markets.

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.

9. Achieving emissions reduction goals will require sustained support for building electrification, and Rhode Island should sustain the HHPP incentives through utility energy efficiency programs following HHPP completion.

Rhode Island has over 130,000 homes reliant on fuel oil and propane, and over 220,000 homes reliant on natural gas; combined these represent more than 84% of all houses in the state.¹³ Decarbonizing these homes over the next 25 years will require significant and sustained support from the federal, state, and local level, and HHPP is an important starting point for these critical market and cultural transformations. Incentives that expand and then quickly expire can cause frustration among homeowners, and Rhode Island should take steps to ensure that Rhode Island Energy efficiency programs are available to continue HHPP rebates at the same levels upon HHPP completion.

Conclusion:

Dandelion thanks the OER for the opportunity to provide comments on the HHPP. The incentives proposed by the HHPP will be an important step towards building decarbonization, but fully meeting the climate goals of the Act on Climate will require increased and sustained incentives over many years to fully eliminate fossil fuel use in Rhode Island homes.

Respectfully submitted,



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

¹³ U.S. Census Bureau, American Community Survey 2020, Table DP04, <https://data.census.gov/cedsci/table?q=United%20States&t=Housing%3AHousing%20Units&g=0400000US44&t=id=ACSDP5Y2020.DP04>

Memo



STATE OF RHODE ISLAND
**ENERGY EFFICIENCY &
RESOURCE MANAGEMENT COUNCIL**

To: Rhode Island Office of Energy Resources

From: EERMC Consultant Team

CC: Anika Kreckel

Date: August 31, 2022

Subject: EERMC Consultant Team Comments on OER's Proposed High-Efficiency Heat Pump Program Design

CONSULTANT TEAM

The Rhode Island Energy Efficiency and Resource Management Council's (EERMC) Consultant Team (C-Team) is pleased and excited by the announcement of the Office of Energy Resources' (OER) High-Efficiency Heat Pump Program. The C-Team welcomes the opportunity to provide comment on OER's proposed program design document for this program. In reviewing the proposed program design, the C-Team submits the following comments and questions.

- Is OER prepared to propose any initial program project goals by year, technology (heat pump vs. HPWH), and incentive type (Residential vs. Enhanced vs. Community)? While these could be developed in concert with the Program Administrator, they would also be useful to include in the Program Administrator RFP. The C-Team also understands that estimating the number of Community incentive projects might be difficult given the possible wide range in scale of these projects.
- When is the program expected to be open to applications? By or before the start of the 2023?
- Can more information be provided on the responsibilities of the Program Administrator and the process by which they will be procured? What is the timeframe by which the Program Administrator will be hired? The C-Team recommends that the draft Program Administrator scope of work to be included in any Request for Proposal be made available for public review.
- Could Rhode Island Energy bid as a Program Administrator?
- The draft program design speaks to Educational Initiatives, but not specifically to marketing activities. Are marketing activities assumed to be part of the Educational Initiatives? If so, is there enough budget for all these activities?
- What are the assumed (annual?) budgets for the Program Administrator, for Educational Initiatives, and, if not part of the Educational Initiatives, for marketing? The current draft Program design does not specify the size of the Educational Initiatives budget and states that these funds will be pulled from the incentive budgets.
- Will the proposed 0% financing be subsidized through the proposed Program budget which would then have the effect of reducing the total funds available for incentives? The C-Team asks this as a point of clarification as we do see a benefit to the Program having a financing component. Will the Program Administrator, or a subcontractor, be responsible for running the 0% loan offer? Could the Rhode Island Energy HEAT Loan be leveraged for this purpose?
- The C-Team strongly supports efforts to attain full displacement of fossil fuel use in homes using these for space heating. That said, the C-Team suggests that OER consider setting a lower displacement threshold - possibly 70-80% of design load - for homes with hydronic heating systems and for homes using existing central air conditioning ductwork. If partial displacements were allowed, there would then need to be requirements for the use of integrated controls.
- ENERGY STAR will have new heat pump specifications (Version 6.1) starting on 1/1/2023. Please ensure that the proposed efficiency levels are at least as high as ENERGY STAR and also note that the efficiency metrics to be used for meet ENERGY STAR eligibility (SEER2 and HSPF2) differ

from those in the draft program description. Further, ENERGY STAR has developed its own cold climate specification. Please assess whether and how this specification might supersede NEEP's cold climate specification and the reference to NEEP's qualified Heat Pump List.

- The C-Team has some concerns as to the inclusion of air to water heat pumps in the Program offer given the lack of market preparation and general lack of familiarity of most HVAC contractors, even heat pump savvy ones, with this technology. At a minimum, the scope for the Program Administrator should address this as part of the Workforce Development scope.
- The proposed HPWH UEF should be increased to at least the current ENERGY STAR level of 3.3.
- Please clarify that Customer Eligibility applies to both space and water heating.
- Clarify the text under Customer Process that reads:
Make (or recommend?) weatherization upgrades, as recommended by HEA.
- Clarify and expand on Program quality control expectations and procedures and the Program Administrator's role in performing and/or overseeing these responsibilities.
- Regarding weatherization in participating homes, the C-Team recommends there should be a bonus incentive offered if non-Enhanced incentive customers weatherize.
- Should there be any bonus incentive for customers installing both heat pumps and HPWHs? This may be important for customers doing full displacement of combined space and water heating boilers and furnaces.
- Proper sizing should be an important consideration regardless of the incentive type. Currently, proper sizing is only discussed in the Enhanced incentive description.
- Why are the proposed incentives for heat pumps twice as large for community incentive (\$2,500/ton) as for non-Enhanced homes (\$1,250/ton)?
- Can additional guidance be provided on the types of workforce training programs that might be funded through the workforce development budget?
- Given the recent announcement of the Inflation Reduction Act and the fact that money will be available to customers engaging in similar activities as is proposed in this program, the C-Team strongly encourages OER to review where there may be areas of overlapping funding and/or to identify areas that may be able to be enhanced.



To: Rhode Island Office of Energy Resources (OER)
From: Erin Kempster and Cassandra Squiers
Energy Solutions
ekempster@energy-solution.com
csquiers@energy-solution.com
Date: August 31, 2022
Subject: Public Comment for the proposed Rhode Island High-efficiency Heat Pump Program (HHPP)

Energy Solutions is pleased to submit the following comments in response to the High Performance Heat Pump Program (HHPP) Draft Program Design issued by the Rhode Island Office of Energy Resources (OER). Our comments pertain to several aspects of the draft program and specifically address the two questions posed within the draft design, namely:

1. Should this incentive (for space heating/cooling) require weatherization? If not, what can be done/how can the incentive be structured to highly encourage weatherization before a heat pump installation?
2. What mechanisms can be put into place to ensure that all rebate-eligible equipment is right-sized?

We applaud the state of Rhode Island and OER for taking bold action to move the state's heating and cooling demand toward a cleaner and more efficient future. We appreciate the opportunity to provide recommendations on how to transform Rhode Island's heating and cooling market expeditiously and equitably. Our comments are organized into the following sections:

- Response to Question 1
- Response to Question 2
- Program Design Considerations
- Incentive Considerations
- Other Considerations

Rhode Island benefits from having a successful history of programs offered in close collaboration through regulated energy efficiency funds and OER, which have brought Rhode Island up along the adoption curve. This creates a fertile landscape to attain OER's ambitious goals for market transformation. Energy Solutions is fortunate to have accrued lessons learned through our lead implementation role for TECH Clean California,¹ a statewide heat pump market transformation initiative,

¹ <https://energy-solution.com/tech/>

as well as through our longstanding implementation of commercial and residential heating and cooling efficiency programs in Massachusetts, New Hampshire, New York, and Rhode Island. In preparation for these comments, we consulted with a variety of stakeholders with a vested interest in Rhode Island's success and have incorporated their insights into our response.

Response to Question 1

Should this incentive (for space heating/cooling) require weatherization? If not, what can be done/how can the incentive be structured to highly encourage weatherization before a heat pump installation?

We recommend providing significant weatherization incentives for low-income residents of homes that are beyond a certain age and are heated by natural gas or delivered fuels. While weatherization is undisputedly a best practice, a blanket requirement for weatherization may prove to be an inefficient use of funds at this time such that the additional expense (both hard and soft costs) may put electrification even further out of reach for residents and small businesses with constrained time and financial resources.

Data from 2015 have shown that a small proportion of residential buildings account for a disproportionately high percentage of emissions. The highest-emitting homes tend to be in cold climates, are larger and/or older than the average home, and use heating oil². As implicitly acknowledged by design of the Weatherization Assistance Program, low-income populations and those living in homes needing weatherization overlap significantly.³ Coupled with the fact that only 8 percent of Rhode Island homes currently heat with electricity, it stands to reason that the majority of homes most in need of weatherization likely sit within the 20 census tracts designated as disadvantaged communities in Rhode Island; primarily in urban areas.⁴ With 54 percent of homes in Rhode Island heated by natural gas,⁵ low-income households may find that, absent weatherization, the potential cost savings of higher efficiency electric equipment may be negated by the higher operational costs. We therefore recommend that weatherization funds be focused on those homes that are the most energy-intensive; with a particular focus on older homes in DAC census tracts.

Current weatherization requirements in Rhode Island feature significant monetary incentives for customers. While these financial incentives surmount the hard costs to weatherization, many soft costs may remain. These include time, effort, and potential lost wages resulting from the scheduling of these services as well as remaining home during the service period itself. We therefore recommend that OER's program design acknowledge these costs and fund research or pilots to address them before requiring weatherization for every installation.

² <https://www.synapse-energy.com/which-buildings-are-highest-carbon-emitters>

³ <https://www.benefits.gov/benefit/1879>

⁴ <https://ecori.org/r-i-s-new-heat-pump-program-offers-incentives-to-install-energy-efficient-system/>

⁵ <https://energy.ri.gov/sites/g/files/xkgbur741/files/documents/HST/RI-HST-Final-Pathways-Report-5-27-20.pdf>

Response to Question 2

What mechanisms can be put into place to ensure that all rebate-eligible equipment is right-sized?

During the first phase of the program, we recommend that right-sizing be addressed through workforce education and training efforts initially rather than required. Similar to weatherization, use of Manuals J and S is a best practice, but a blanket requirement to ensure heat pump products are right-sized may add barriers to a market that is still maturing and already has high barriers to entry, thereby slowing adoption.

Due to the additional work and expense required for contractors, an incentive “kicker” may be appropriate as well. As the market matures to the point that installers are educated and comfortable with the technology, right sizing requirements could be added such that the program matures with the market. While Manual J is a “best practice” it is difficult to get contractors to see the value when they have predominantly been using square footage calculations for their entire careers.

The TECH Clean California initiative provides a \$600 incentive for contractors to use a Manual J calculation. The initiative has incentivized over 8,000 installs, with nearly 550 having a completed Manual J. Because the TECH program benefits from post-install metering, we will soon have data showing whether those Manual J calculations resulted in installations that deliver more energy savings than those without. We recommend that OER leverage those findings to help determine its approach regarding right-sizing requirements.

Program Design Considerations

When administering market transformation programs, there is often a push-pull between scale and specificity. The promise of scaled deployment and stability of expectation are crucial to enable market actors to invest in technologies beyond their typical offerings, including the training, stocking, and marketing infrastructure that such a pivot requires. Meanwhile, program administrators often need demonstrable benefits to specific customer types in order to fund programs, which generally requires detailed information collection and reporting on each installation. Our recommendations in the sections below are in support of these program design principals.

Contractor-Based Instant Incentive Program Design

The proposed program design indicates point-of-sale incentives will be offered for heat pump water heaters, and we recommend this instant incentive model be extended to HVAC heat pump as well to ease customer financial burden and increase installer buy-in to promoting heat pumps.

Contractors are the primary influencers of what equipment residential customers and small businesses select for their both space and water heating needs. Creating demand via contractor incentives will:

- Provide equipment cost relief to customers as quickly as possible so they do not have to carry the burden of fronting high product and installation costs while waiting for incentive reimbursement. Fewer than half of U.S. adults have enough savings to cover an unplanned \$1,000 expense⁶, meaning that purchase and installation of new equipment is out of reach absent significant incentives or accessible financing at the time of purchase. Compounding this issue is that the majority of equipment replacements are on an emergency basis, meaning that residents, landlords, or businesses would likely not have been saving for a planned replacement.
- Motivate distributors to stock heat pump equipment, ensuring it is available for replace on burnout scenarios, which account for the majority of heating and cooling equipment purchases.
- Motivate contractor education and training. A key barrier to heat pump technology adoption is contractor expertise and motivation to sell, install, and properly size duct work for heat pumps that replace a gas furnace. Contractor incentives create motivation to upsell and engage in the Rhode Island programs planned workforce education and training efforts.
- Increase customer satisfaction with the contractor experience, which is a key motivator for contractors, who are highly dependent on customer reviews and word-of-mouth referrals. For example, the TECH Clean California initiative offers a contractor level incentive and the initial evaluation survey showed 95% of customers were satisfied with their HVAC contractor⁷.

To create contractor buy-in to offering incentives to customers, contractors need to kept cash-flow positive and have a low-effort, streamlined avenue for submitting incentive applications. To accomplish this, we recommend instituting an incentive application submission process that is simple, straightforward, and that prioritizes rapid repayment to contractors in 30 days or fewer (which is often more quickly than a contractor would receive the balance payment from a customer).

As the market develops and other contractors recognize the value of the electrification market, contractors will increasingly compete and drive down prices while distributors increase heat pump stocking and sales. The establishment of a clear profit motive for market actors creates market support for needed future heat pump policy initiatives to complete market transformation.

Heat Pump Distributor Engagement

To effectively influence the market, we recommend the workforce education and training component of the program incorporate training for key distributor staff on how to sell high efficiency heat pumps to installers.

Ensuring workforce education and training efforts include distributor sales staff will facilitate buy-in and engagement from decisions makers with influence over heat pump stock and sales, making it easier for customers when working with installers. While the HVAC and water heating supply chains have adapted incentives and early adopter desire for high efficiency equipment, by and large, the industry is ruled by incumbency. Even though it results in higher commissions, most contractors do not focus on selling

⁶ <https://www.bankrate.com/banking/savings/financial-security-january-2022/>

⁷ [Quarterly Stakeholder Meeting TECH Clean California | June 2022](#)

high-priced (i.e., high efficiency) equipment. Rather, contractors pit distributors against one another to drive down equipment purchase cost. As a result, distributor salespeople are more focused on meeting sales volume quotas than on selling high-margin equipment, and so intervention is needed to motivate them to upsell expensive equipment, like heat pumps, to their installer. This dynamic is even more prevalent with contractors who default to a lowest price sales strategy, and rarely offer high efficiency equipment, even as a second option, for fear of losing the bid to a lower priced competitor. Though some contractors have invested in high efficiency sales training for their sales field teams, most have not.

Actionable Data Collection Framework

We recommend that the Program support a comprehensive data framework such that data across relevant avenues (rebate applications, electricity meters, market actor meetings, etc.) is centrally compiled for holistic and comprehensive analysis to quantify decarbonization benefits and enable data-driven decision making.

Highly accurate data and market actor buy-in informs and supports policy development and stimulates market transformation. Rhode Island is in the beginning stages of widespread heat pump adoption and creating a mechanism to bring together data across various sources from the outset can be highly valuable to advancing decarbonization in the state. Data on heat pump prices, program deployment progress, customer and contractor heat pump program experience, meter-based consumption, etc. are needed to quantify the value of electrification and proactively identify trends, supporting continual improvement and key decisions as the program and Rhode Island market mature.

Incentive Considerations

Heat Pump Water Heater Incentives.

If feasible, we recommend offering generous incentives for Heat Pump Water Heaters of at least \$1,050/unit for the customer either stand alone or when paired with Heat Pump Water Heater incentive offered by RI Energy, and a spiff of \$100/unit for the market actor providing the instant rebate. A higher incentive will more adequately motivate fuel switching by bringing heat pump water heater purchase price more in line with incumbent water heater options. Based on insight from A.O. Smith, the incremental cost from a standard efficiency unit to a heat pump water heater is approximately \$1,200, which justifies this incentive rate. While many Northeastern state incentive programs offer incentives in the \$600-800/unit range, higher incentives have been adopted in other regions. For example, PSEG in New Jersey and Long Island offers a \$1,000/unit incentive for heat pump water heaters and the California investor-owned utilities offer up to \$1,000-3,100/unit.

Aligning Residential and Community Incentives

We recommend that incentive levels for heat pump technologies offered in both the community and residential portion of the program be aligned for products sized appropriately for both residential and

small commercial use. This will streamline the offering and prevent confusion or dissatisfaction among small business customers where the line between residential and commercial is blurred. In Massachusetts, for example, we serve as the rebate processor for the Commercial Heat Pump program and have experienced a few cases of having to re-directed business customers applying for commercial rebates to the residential program because they were on a residential meter (businesses operating out of homes, multifamily properties, etc.). Because the residential incentive levels are lower for the same equipment, these customers becoming confused and dissatisfied. Conversely, we serve as the midstream implementor for the Residential and Commercial ECM Pump programs in Massachusetts, and since incentives were aligned across the two sectors, the programs have influenced more sales through a more seamless distributor experience; distributors do not have to mind the nuances of meter type for small business and multifamily customers when upselling installers; the incentive is the same for the same product regardless of the customer's electricity rate. Similarly, manufacturers promoting the program with their networks via market materials and equipment trainings are able to deliver a simpler message.

Other Considerations

Heat Pump Product Minimum Efficiency Requirements

To align with the new federal standards that apply to HVAC equipment manufactured on or after January 1, 2023, we recommend adding a SEER2 and HSPF2 minimum efficiency requirements for air sourced heat pump <5.4 tons, as unitary HVAC equipment will be getting new ratings: EER2, SEER2, and HSPF2.

Customer Eligibility Requirements

The program design states that all homeowners of buildings with up to four housing units will qualify for residential incentives. As the program design is finalized, we recommend clarifying the eligibility of housing buildings with five and more dwelling units. Will these buildings be eligible under the Community incentives? There are many of these larger multifamily buildings in Rhode Island and most affordable housing would fall into this category, so there is an opportunity for greater program impacts to clarify and ensure all multifamily buildings are eligible for incentives.

Rhode Island Office of Energy Resources
1 Capitol Hill
Providence, RI 02908

Re: High-efficiency Heat Pump Program (HHPP)

Enclosed for filing are comments of Franklin Energy Services, LLC, on the State of Rhode Island Office of Energy Resources' High-efficiency Heat Pump Program (HHPP).

By way of introduction, for more than 26 years, Franklin Energy has delivered energy efficiency and grid optimization programs for utilities through integrated services with smart solutions implemented by over 1,100 energy professionals. Founded in 1994 in Port Washington, Wisconsin, Franklin Energy has helped more than 100 utilities and government agencies design and administer programs providing energy efficiency, water conservation, load management, heat pump installation, electric vehicle infrastructure, and workforce training services. Our programs reach end use customers of all types including a) market rate and low-to-moderate income single-family and multi-family; b) large commercial and industrial; c) small business; d) government facilities; and e) the agricultural sector.

Franklin Energy commends the Office of Energy Resources for its ingenuity in using ARPA funding to develop the HHPP. By using this funding, the state has set the foundation for heat pump integration, which will help Rhode Island meet long-term goals for reducing greenhouse gas emissions. As decarbonization goals ramp up across the country, and as legislation is passed on both the federal and state level to set those goals, the country must look at all opportunities to reduce carbon emissions. On August 16th, President Biden signed into law the Inflation Reduction Act (IRA), a law that represents America's largest investment to fight climate change. The IRA provides tax credits and rebates for use when buying heat pumps or other energy-efficient home appliances, which would, in turn, help energy consumers reduce their energy bills. This law speaks to just how important heat pumps are to the conversation on decarbonization. Through the implementation of the HHPP, Rhode Island will have documented lessons learned that can be utilized as the state pushes for additional electrification of homes with the injection of IRA funding. It is from this perspective Franklin Energy submits its comments.

Weatherization

Franklin Energy works in several jurisdictions where the question of requiring weatherization as pre-requisite to, or in conjunction with, a home electrification and heat pump installation project. Most programs encourage weatherization to reduce loads in conjunction with purchasing a new heat pump. And although there is no denying the importance of weatherization, requiring that homes first be weatherized, in order to participate in programs like HHPP, can create barriers to participation. For example, weatherization requirements may deter HVAC contractors from pursuing heat pump installation business because the weatherization piece is a separate, skilled trade from HVAC. Instead of hard and fast requirements, Franklin Energy recommends that the HHPP not require weatherization, but instead encourage participants to weatherize by provide technical assistance resource and using available utility incentives to enable weatherization with the heat pump.

Third-Party Administration

Although the plan speaks to the programs being run by a third-party entity, we suggest that the plan should speak specifically to the scope of what the third-party administrator will be responsible for. In Franklin Energy's experience, the HHPP program will only be successful if it can be managed by a qualified third-party implementation firm that can bring a customer-centered and contractor-focused concierge service that coordinates the home assessment, HVAC and Weatherization contractors. The administrator could also manage the rebate process as well as educate consumers on the benefits of heat pump technologies. Customer education, acquisition, and engagement are resource-intensive and require innovative technical expertise in multiple areas. Additionally, contractor and trade ally recruitment, education, and oversight are also critical and will require sufficient resources, particularly at the start. These tasks, among others which would be necessary to run a successful program, and their corresponding costs should be specifically accounted for in the plan.

Education

Where Franklin Energy has seen programs rise and fall is in the area of participant education, among both the customer and installers. The Rhode Island General Assembly's desire to generate greater awareness of high-efficiency heat pump technologies and create greater acceptance of the technology among installers is not unique to Rhode Island. With the move to electrification, more consumers working from home, and improved technology comes the growth in the market for heat pumps. This requires buy-in from seasoned installers who may be resistant to heat pumps initially and may advise their customers to stay with their delivered fuel or natural gas space and water heating equipment. As contractors become more comfortable with the technology, they will be better prepared to educate consumers and see the business opportunity associated with heat pumps. By providing educational campaigns targeted to contractors that help them capitalize on rebate programs and maximize benefits, while expanding outreach to diverse contractors, those in disadvantaged communities, and those not currently completing energy efficiency and/or decarbonization work, the program will have runway to be successful.

As this proceeding moves forward, and as customers become more involved in the stakeholder process, the need to educate them on the components of HHPP will become greater. With regards to customer engagement, as homeowners begin to participate in the HHPP, simplifying the enrollment process, through a one-stop-shop third-party administrator takes the guessing out of participation. With a third-party administrator, customers would have one place to go to educate themselves on program offerings, check qualifications, submit for rebates, and schedule installations.

Mechanisms to Ensure Rebate-eligible Equipment is Right-sized

To ensure that equipment is rightsized, the HHPP should utilize standards and widely accepted approaches to energy modeling. Based on our experience, programs would need to require Air Conditioning Contractors of America (ACCA) manual J, D and S calculations to be completed to be rebate eligible. ACCA's Manual J, which is recognized by ANSI for thermodynamic modeling, should be leveraged for standards for proper sizing and quality installation in our HVAC programs. In addition to ACCA Manual J, Manual D can be used to develop a retrofit project scope that reduces demand and saves gas and electricity.



Franklin Energy stands in support of the HHPP program goals, as we have seen several states, through legislation like the Act on Climate, move the needle towards net zero. Across our footprint and through utility partnerships, we help drive the transition to a net-zero carbon future while working to ensure that no families, businesses, or local communities are left behind. On behalf of our utility partners, we served more than 3.6 million customers in 2020. This work resulted in the reduction of 1.6 million metric tons of carbon. We are available to consult the Rhode Island General Assembly in any way deemed appropriate.

If you have any questions, please do not hesitate to contact myself, Dena Jefferson at djefferson@franklinenergy.com.

Respectfully submitted, this 31st day of August 2022.

A handwritten signature in blue ink, appearing to read "Dena Jefferson", written over a horizontal line.

Dena Jefferson, J.D. (she/her)
Director of Regulatory Affairs
Franklin Energy
Tel. 262.229.6474
djefferson@franklinenergy.com



August 29, 2022

Dear OER staff:

Thank you for this opportunity to comment upon the Draft Program Design for the High-efficiency Heat Pump Program. Green Energy Consumers Alliance is a nonprofit organization based in Providence and Boston. Our mission is to harness the power of consumers to speed the transition to a zero-carbon future. We have forty years of experience in helping consumers heat their homes and businesses more affordably and sustainably.

We share your goals of making heat pump technology more accessible and affordable to Rhode Islanders and increasing both the number and the skills of heat pump installers. Our assessment is that the Draft Program Design was a solid effort given that it was written before passage of the federal Inflation Reduction Act (IRA). However, with respect to heat pumps, IRA is truly a game changer and cause to consider making modifications to the program.

HPPP should leverage funds from the Inflation Reduction Act

The draft stated that the cost of educational initiatives would be small and would come out of each program category – residential, enhanced, community, and workforce development. That allocation made sense when the pool of funds was limited by the \$25 million in ARPA funds. But now, we recommend increasing the budget for consumer education and workforce development in order to leverage what IRA has to offer. IRA will stimulate a much higher demand than the state’s current “heat pump infrastructure” can manage.

IRA creates an opportunity to multiply the state’s commitment to heat pumps many times over. For example, IRA will provide heat pump incentives ranging from \$2000 in tax credits to \$8000 in rebates for income-qualifying families. In addition, IRA provides generous support for other projects relating to home electrification and efficiency. Using conservative math, if Rhode Island were to assist 20,000 homes and community-based organizations to obtain an average of \$5000 per home in IRA money for heat pumps, the Ocean State would bring in \$100 million in federal funds (not including funds that would come in for electrical system upgrades, heat pump water heaters, induction stoves, and more).

Coordinate HPPP with Energy Wise and IRA

We are also concerned that consumers will have difficulty understanding how Energy Wise/Rhode Island Energy, IRA, and HPPP all relate to one another. Therefore, we recommend that OER set up a website and hotline in multiple languages to provide one-on-one advice to consumers about how to integrate the resources offered by each funding source.

OER might consider adapting a new website hosted by Rewiring America at <https://www.rewiringamerica.org/app/ira-calculator>. With visitors entering only 5 data points, an algorithm displays all the potential benefits of the IRA for that demographic. With a few more datapoints, OER could display potential benefits from Rhode Island Energy and OER as well.



We also recommend that OER prioritize educational efforts lead by organizations based in the “disadvantaged communities” as defined by ARPA. Mass Save’s [Community Education Grant](#) program and its [Community First Partnership](#) program are two examples of the type of community-based outreach and education we believe would strengthen heat pump access in Rhode Island. Again, with the complex funding landscape now including IRA rebates and tax incentives, OER’s HHPP, and rebates normally administered by Rhode Island Energy, education and even some degree of concierge service is needed.

Quality Control and Data Collection

We urge OER to fund a high percentage of Quality Control inspections to ensure a statistically significant set of robust, demographically representative data on program participation and heat pump installation costs and benefits. Data gathered on these inspections needs to be published promptly, ideally quarterly, so that incentives, workforce development, and consumer education programs can be changed to reflect what is learned.

Weatherization & Right-Sizing Heat Pumps

With regard to the question posed in the draft plan, “Should this incentive (for space heating/cooling) require weatherization?” we strongly believe weatherization should be required. Funding heat pump installations in buildings that have not been fully weatherized is a waste of public dollars. Since the draft already mandated weatherization for the Enhanced Incentive, it should be relatively simple to require the same for the basic incentive.

Likewise, for the question regarding the right-sizing of heat pump equipment, finding a way to foster right-sizing is a crucial aspect of making heat pumps more affordable. This can be done in a variety of ways, starting with contractor training. This program could require a greater degree of oversight on contractors approved for referral by the Program Administrator. We would support a mandate that heat pump system designers submit data on an initial number of installs funded through this program, including model numbers, square footage of conditioned space, heating and cooling load calculations, and total itemized cost of installation. The Program Administrator would use this data to score for optimal performance, with the recourse to stop referrals and future rebate applications from underperforming contractors. Given the complexity of heat pump system design, we would also support a mandate for pre-application and approval of all projects for the first year of the Program.

Regarding the eligibility of gas heated homes for the residential rebate, we would support a requirement for an HEA to document the efficiency of gas systems proposed to be replaced by heat pumps, and a restriction of rebates to only those gas systems that fall below a certain efficiency threshold. This might prevent some instances where a heat pump installation might result in increasing a household’s energy burden rather than decreasing it.

Our final comment relates to this statement under the Residential Incentive: “heat pump systems must be sized to heat and cool the whole home.” In our experience, we have talked with many homeowners who choose to install a heat pump in only one section of their home. We believe that this is one way to



address the affordability issue with heat pumps, and may be most appropriate, particularly for moderate-income households and in buildings with efficient gas heating equipment, or those with hydronic heat distribution systems. We understand if OER is attempting to narrow its data set to whole home heat pump installations, but would encourage consideration of partial home systems as well.

Yours respectfully,

Larry Chretien, Executive Director

Loie Hayes, Energy Efficiency Coordinator

RI Energy Comments on OER's HHPP Program – September 2, 2022

- It is important to ensure the OER HHPP Program and RIE's Energy Efficiency Programs are coordinated as much as possible, such that, for example, customers engage in weatherization through the RIE program before installing heat pumps under the OER program.
- Was it intended to exclude ground-source and air-to-water heat pumps from the list of eligible equipment under the Enhanced Incentive when these solutions are "eligible" under the Residential Incentive? That is, if a low-income/disadvantaged customer is financially eligible for both the Residential and Enhanced Incentives, does this mean they are precluded from having ground-source and air-to-water heat pumps installed if they want to take advantage of both incentives? Or were ground-source and air-to-water heat pumps inadvertently left off the list of eligible equipment under the Enhanced Incentive?
- In the Funding Overview on Page 4 the Community Incentive budget is \$5,230,000, but on Page 8 it says \$12 million. Is the \$12 million is a mistake?
- On Page 5 it says the Community Incentive includes public buildings, but public buildings aren't mentioned on Page 8 under Customer Eligibility.
- How is **small business defined**? How will larger customers be excluded?
 - Consider **cap on per-project incentive** so large projects don't eat through budget. Potentially avoids need to define small business.
 - EE program definition is <1 million kWh or 100,000 therms of annual electric/gas use.
- Consider funding **Multifamily** projects >4 housing units –
 - Tough to reach many low/moderate income customers without targeting multifamily. Many customers living in MF buildings might not be served through Residential, Small Business, or Community pathways.
 - VRF (central ASHP) is a great technology for multifamily!
- RI Energy Large Commercial New Construction program –
 - Program promotes **low EUI and zero net energy (ZNE) ready designs** through EUI-based incentives and technical support from ZNE design experts.
 - Would love to have supplemental **funds for heat pumps** for all-electric buildings that meet ZNE requirements.
 - **Incentive cap** would ensure large projects don't consume whole budget (\$250K per site?). Only a few buildings come through this pathway each year.
- Workforce
 - **Training programs already available** in many cases. The key is to plug the gaps.
 - Upskilling: Design & installation training for HVAC contractors is typically free through manufacturers/distributors. Is public funding needed for additional programs?
 - New workers: HVAC technicians trained at technical schools, community colleges, and apprenticeships.
 - Upskilling: Workforce upskilling might focus on incremental improvements to support program goals or best practices.
 - **Whole home:** Most ccASHP's provide supplemental heat. Training could focus on best practices for whole home electrification, such as weatherization, importance of Manual J/system sizing, physical system design practices, etc.

- **Enhanced HVAC certifications** (NATE Level 4, Certified Geothermal Designer, etc.). Can provide broader list if that would be valuable.
- New workers:
 - Might be need for broader workforce investment in **HVAC technicians** –Could dollars be used for that if there's heat pumps are included as a specific focus?
 - Equity goals might be more easily achieved through **targeted marketing & outreach** to connect targeted populations to existing training programs (technical schools, community colleges, apprenticeships), rather than developing new programs to target them.
 - MassCEC internship program is a great template for a workforce development program. More targeted to professionals (especially mechanical engineers). Could potentially develop similar program for apprentice HVAC techs focused on heat pumps.
- General notes on C&I market, besides multifamily:
 - Good candidates:
 - New construction
 - Buildings with comfort heating & cooling (office buildings, schools, public buildings, etc.)
 - Buildings with large cooling loads relative to heating (e.g., large offices)
 - Difficult buildings: Industrial, warehouses, anything with gas heat and large heating load.



August 31, 2022

Anika Kreckel
Rhode Island Office of Energy Resources
(OER) One Capitol Hill
Providence, RI 02903

RE: Comments on Air Source Heat Pump Program design

Dear Anika:

Thanks for the opportunity to provide further input to the RI OER. The proposed draft offers a workable framework for developing additional details on program implementation.

A few quick observations:

- The OER may wish to consider a “registration” process whereby potential applicants would indicate their interest in applying for the “Residential Incentive”. As written, the OER would have a very limited view of the “pipeline” of applicants for this pool since applications would not be submitted until after an installation is completed. The registration could be a web-enabled automatic process that would facilitate provision of instructions and information for those who may intend to apply. Early on, there is no issue of running out of funds, but as the program progresses, having some sense of the potential pool will be helpful.
- The OER should consider submittal of a completed sizing tool from a recognized technical resource as a requirement of an applicant for a “Community Incentive”. The resource who will be responsible for evaluation applications should have the technical expertise to complete this task.

Conclusion. We are available to discuss any of these issues at your convenience.

Please feel free to contact me at vgraziano@riseengineering.com, or by calling my cell at 401-524-2517. Thanks for your consideration!

Sincerely,



Vincent R. Graziano,
President

August 25, 2022

Commissioner Christopher Kearns
Office of Energy Resources
1 Capitol Hill
Providence, RI 02908

Dear Commissioner Kearns,

Thank you for the opportunity to provide comments on the \$25 million High-efficiency Heat Pump Program (HHPP).

The Nature Conservancy is a global organization dedicated to conserving the lands and waters on which all life depends. Here in Rhode Island, The Nature Conservancy protects more than 14,000 acres of land and has partnered on the permanent conservation of more than 40,000 acres of land. At The Nature Conservancy, we recognize that we cannot succeed in our core mission without seriously addressing climate change – both mitigation and adaptation. The science is clear and unequivocal: we need to fully decarbonize our economy by 2050, with major emissions reductions before 2030. Electrifying the thermal sector will play a big role in this transition.

We are grateful to see significant amount of funding dedicated to heat pump incentives. Currently, Rhode Islanders transitioning away from oil and delivered fuels have incentives to switch to fossil gas. The current market for heat pump installation is still in its early stages in our State, and a program like this could jump start its success and make transitioning to energy efficient electric heating and cooling within reach of Rhode Islanders. The Nature Conservancy is not a technical expert on heat pump technology, but we respectfully submit the following feedback based on the draft program design released in July 2022.

- **Climate in Program Goals:** The program goals do not currently list implementing the state's required emissions reductions from the Act on Climate legislation. Can this be added as an overarching goal? Including carbon emissions as an explicit goal can influence how the program is designed and administered.
- **Program Administration:** The Program Administrator for HHPP has not yet been identified. The Administrator will play a key role in ensuring the success of HHPP. This program will hopefully grow and expand after this initial phase. Creating and administering a \$25 million program is challenging and requires an administrator with legal, technical, and customer-service skills, experience, and resources.

The Program Administrator should also be knowledgeable about other relevant Rhode Island programs. It should also be an entity that the applicants trust and have experience interacting with. For example, if the rebates will be administered to the contractors/businesses, an entity like the RI Commerce Corporation may make sense given their track record and experience in managing the Renewable Energy Fund. If the rebates will be administered to individuals, the energy efficiency program administrator (currently Rhode Island Energy), may be an appropriate entity. The RI Infrastructure Bank also has experience administering loan and grant funds. There are many nonprofit partners in Rhode Island who also have direct experience administering programs who could be excellent partners if the opportunity arose. The design will follow the strategy of the program – but the need to have an entity with experience and resources to manage a program of this type will be essential regardless.

- **User-Friendly:** The people who participate in this program should not need to understand the intricacies of state government agencies, the electric system, or decarbonization policy in order to successfully participate. When people make investment decisions for their home, they want to know things such as: what is the full price and when will it need to be paid, what is the payback period, will it increase the comfort of my home, who can perform this service, will it increase my bills, what are my other options, what happens if I don't do this. The program should be as user-friendly as possible – not assuming any additional knowledge or interest from the customer. A customer should be able to easily find a list of contractors who can perform the work, contact those professionals, have their system installed, and benefit from the program without having to jump through a lot of hoops. Information should be communicated to them in an easy-to-find location and from a trusted source. There are elements of this current proposal – for example

adjusting incentive levels based on your economic status and geographic location – that could be difficult for a regular person to sort through. These can be important program elements to appropriately target the incentives, but we recommend making this as easy as possible for potential users to interact with.

- **Multiple Quotes:** A specific example of where the process could be streamlined is with the requirement to get three quotes. While we want to incentivize participants to find the best quote and lowest price for their specific circumstances – it is currently difficult to find and schedule any contractors to do this work (let alone three). Another way to do it would be to have an equivalent of the Master Price Agreement – or an approved vendor list -- the way that the State maintains a list of approved vendors or Rise Engineering has a list of vendors who program participants can call for the energy efficiency programs. This might be easier for customers to navigate than requiring three different contractors come to their home.
- **Equity:** In reading the different programs available for disadvantaged customers vs. market rate customers, the program feels much more difficult to navigate and potentially more expensive to participate in for the disadvantaged communities. We understand that there are slightly larger incentives for these customers, which might be what is triggering the additional program oversight. However, disadvantaged populations who may need the larger incentive are not more able to navigate complex government processes than market-rate customers. We strongly recommend making the user-experience for low-income Rhode Islanders as user-friendly and frictionless as possible.
 - Further, why is the program requiring weatherization for low-income and disadvantaged customers but not market rate customers? While from a purely engineering perspective, fully weatherizing your home prior to installing heat pump technology is preferable – given that this is a resource-limited program, why would we put additional cost and time hurdles in front of disadvantaged customers from participating? We already see that the energy efficiency programs consistently underperform for multifamily and low-income housing. If we require weatherization for participation in the HHPP, we could see significant under-utilization by these same residents, some of whom would greatly benefit from heat pump technology.
 - **Intermediary:** Why does the program *require* an intermediary for the low-income disadvantaged incentive? Why can those residents not participate in the program the way that other customers do? Having an intermediary available to help navigate the process could be helpful, but requiring that customers work through another agency seems to put a hurdle in front of their participation that market-rate customers do not have.
 - **Enhanced Incentive for Oil & Delivered Fuels:** Why is the enhanced incentive only available for those on oil and delivered fuels? To reach our climate goals, residents currently relying on any type of fossil fuels (delivered or fossil gas from the utility) will need to transition to decarbonized thermal systems. Further, homes in the urban core are more likely to be connected to the fossil gas delivery system, while homes in the more rural and suburban areas are more likely to use delivered fuels. The current program design would likely benefit suburban and rural residents over the residents of the urban core.
- **Definitions:**
 - The document uses the phrase “disadvantaged communities” a number of times, but it does not define it. The document references the US DOE’s Justice 40 Initiative, but also says that the definition will be altered at the discretion of the Office of Energy Resources. The definition of Disadvantaged Communities should be vetted by the public – both those with professional expertise and those with lived experience living in disadvantaged communities. There may also be interaction with definitions in the Inflation Reduction Act at the federal level, as well as with definitions being developed by DEM and the Division of Planning and the EC4. We ask that whatever the definition is used that it harmonizes not only with the input from the community, but with definitions used by other government entities.
 - The acronym PRO is used several times throughout the document, but we did not see it defined anywhere. Can you define PRO?
- **Strategic Deployment of Funds:** Within each of the sub-categories, the program reads as if it is designed as a ‘first come, first served’ program. Is there a more strategic way to organize the program? Can it be combined with and/or leverage other programs to expand its reach? Or can it be targeted geographically to areas that would otherwise need pipeline upgrades or other infrastructure investments? We understand that government programs cannot and should not advantage any specific people, but first-come, first-served often actually advantages certain populations with increased access to information and resources.
 - Similarly, the document states that “serving a wide range of Rhode Islanders” is a goal. Why is a broad range preferable to targeted incentives to specific needs? If targeted

investment in a specific geographical area or to a specific subset of residents would create deeper decarbonization or reduce costs to the system or prevent further development of fossil fuel investment, why couldn't the State target the investment in some way for this type of limited program?

- **Program Specific Details:**

- **Renters:** Are renters able to access the regular incentive for 1-4 unit buildings, or is it only landlords? Restricting it to landlords only could restrict who is able to participate in the program. There is a well-known split incentive between landlords and tenants for upgrades that cost the landlord money, but where the tenant receives the financial benefit. Allowing renters to take advantage of the program could remove that disincentive.
- **Paperwork:** The way that this program is currently designed, homeowners are required to submit all of the relevant paperwork and then wait three months for their rebate. Government paperwork for this type of incentive can be complex and technical. We have concerns that this will limit successful receipt of the incentive and provide advantages to homeowners with additional resources – such as time, money, and legal expertise. We also have concerns that homeowners could install the systems with the expectation of a rebate and then get denied for improperly filling out a complicated form.
 - The Renewable Energy Fund (REF) is a similar program for incentives for a large piece of clean energy equipment installed by a relatively small number of trained professionals. Is it possible to manage the program similarly to the REF – where the contractor/installer builds the incentive into the price charged for the work and applies for it on behalf of the customer? There is an economy of scale to the contractor filling out multiple applications. If the contractor/installer also just builds the incentive into the price charged for the system, then the homeowner can reduce the amount of financing they need (or upfront payment they make), overall saving them money.

- **Workforce Training:** We are *supportive* of the funding set aside for workforce training and development. Strategically electrifying our thermal sector will require changes in our workforce, and a 'just transition' of our economy will entail retraining workers for the jobs of the future.
 - **Labor Unions:** In developing workforce training opportunities, is the program planning to partner with any of the existing relevant labor unions? The Nature Conservancy is proud of our active participation in the Climate Jobs RI partnership between the environmental community and the labor community. Rhode Island labor unions provide training and apprenticeship opportunities for their members – there may be opportunities to partner and ensure good, family-sustaining jobs in this program.
 - **Women and Minority-Owned Businesses:** The program design says that women and minority-owned businesses are a priority, but there are no concrete ways to prioritize those businesses. Can the program have specific or mandatory goals for participation by minority and women-owned businesses, such that if they are unable to participate, the state has an obligation to determine why and remedy the situation? Just having goals usually does not result in actually increasing the participation of minority and women-owned businesses.

Thank you so much for the opportunity to provide comments on this exciting new program! We would love to see this as an early step to a much broader effort to fully decarbonize our thermal sector. Please be in touch any time if you have any questions about our comments or if we can be helpful in any way.

My Best,



Sue AnderBois
Climate & Energy Program Manager
The Nature Conservancy
Susan.AnderBois@tnc.org

VEIC

Please see attached file in pdf format.



August 31, 2022

Rhode Island Office of Energy Resources (OER)
1 Capitol Hill
Providence, RI 02908

Re: Comments on the High-Efficiency Heat Pump Proposed Program Design

Dear Energy Program and Policy Colleagues:

VEIC applauds the Office of Energy Resources (OER) for initiating an expansion of building electrification programs to address thermal sector emissions from space and water heating. We appreciate the opportunity to provide comments on the High-Efficiency Heat Pump Program (HHPP) Proposed Program Design dated July 25, 2022.

Our comments are informed by VEIC's experience designing and implementing programs to drive adoption of heat pumps in multiple states, including California, New York, Vermont, and Washington, DC. VEIC administers Efficiency Vermont and the DC Sustainable Energy Utility (DCSEU), and we are part of the implementation team for TECH Clean California, a statewide heat pump market transformation program. We also provide consulting services nationally on energy efficiency, building decarbonization, transportation electrification, demand flexibility, and renewable energy. As a mission-driven nonprofit organization, all of our work involves a strong emphasis on equity; in 2020, 50% of our work was within low-income communities. VEIC led or supported the team providing consulting services to the Rhode Island Efficiency and Resource Management Council (EERMC) from 2008-2018 and is familiar with the state's energy efficiency landscape.

At a high level, VEIC believes the proposed program design has many strengths, most notably the holistic approach to market transformation incorporating workforce development and consumer and installer education. Engaging and training customers and market actors is key to market transformation. We also support the inclusion of the full range of heat pump technologies, including air-to-water heat pumps and ground-source heat pumps. HHPP has the potential to become a model for other states as they leverage federal funding to support both heat pump adoption and equity goals, ensuring that 40% of overall benefits flow to disadvantaged communities (DAC).

VEIC's comments focus on aligning the HHPP with a market transformation approach. We then comment on the Community Incentive and respond to the questions posted by OER regarding weatherization and equipment sizing.



Market Transformation Approach

First and foremost, we suggest designing the HHPP as a holistic market transformation initiative that layers seamlessly with existing programs and fills key gaps to drive the market. Based on our experience designing statewide market transformation programs for heat pumps in two states (California and Vermont), we see the following as key elements of market transformation:

- Central data tracking and reporting on progress toward state and market goals.
- Midstream program design to engage the supply chain and provide instant discounts.
- Contractor training and development of a qualified contractor network.
- Robust incentives and financing to encourage fuel switching.
- Program coordination and incentive layering.
- Consumer education campaign to drive demand.
- Enhanced offerings for low- and moderate-income (LMI) households and DACs.

The comments below summarize how these elements are addressed in the HHPP program design and identify opportunities to enhance the program to support market transformation.

Central Data Tracking and Reporting

Rhode Island has committed to reduce carbon emissions 45% below 1990 levels by 2030, 80% by 2040, and to net-zero by 2050. The next 10 years are a critical period to transition the market to heat pumps and some states have set interim targets to track progress. For example, the Maryland Climate Commission recommended that the state should retrofit 100% of low-income households by 2030, encourage fuel switching in the utility efficiency programs beginning in 2024, and target 50 percent of residential heating system, cooling system, and water heater sales to be heat pumps by 2025, 95 percent by 2030.¹

HHPP inclusion or gap: The HHPP proposed program design states that the program administrator “will collect relevant data from this program to track program progress and success,” with metrics to be determined.

Recommendation: We suggest that the HHPP program administrator should play a central role in tracking progress toward the state’s GHG goals in the building sector (including progress towards interim targets for heat pump market share by 2030). The program administrator should be tasked with creating and managing a public data reporting site to collect and share this data with stakeholders. For example, the recently launched [TECH Clean California Public Reporting Website](#) provides publicly accessible data on program deployment progress and

¹ Building Energy Transition Plan: A Roadmap for Decarbonizing the Residential and Commercial Building Sectors in Maryland. <https://mde.maryland.gov/programs/air/ClimateChange/MCCC/Commission/Building%20Energy%20Transition%20Plan%20-%20MCCC%20approved.pdf>



project pricing. Over time, it will include market data (e.g., heat pump market share of HVAC installations), along with aggregated and anonymized meter-based consumption data to quantify and predict electrification costs and benefits at the project and program level. This data will be used by policymakers, market actors, and other stakeholders to inform policy, program, and market actions to drive heat pump adoption.

Midstream Program Design to Engage the Supply Chain

Manufacturers, distributors, retailers, and contractors are key to market transformation. Midstream incentive programs can be an effective strategy to engage the supply chain by working with distributors, retailers, or contractors to provide an instant discount to the customer at point of sale. Typically, the incentive is passed on to the customer through the contractor and distributors receive a small administration fee to handle the point of sale tracking and reporting to the program. Midstream programs support supply chain engagement because they align with manufacturer and distributor business models by driving sales and stocking of higher-margin high-performance products. Effective midstream programs also promote proactive collaboration with manufacturers and distributors on marketing and sales tactics (e.g., joint promotional campaigns), installer training that leverages existing relationships that distributors hold with contractors, and inventory management (e.g., elevating distributor heat pump inventories in advance of campaigns that drive demand, incorporating buy-back provisions to reduce distributors' risk).

HHPP inclusion or gap: The HHPP proposed program design mentions a \$750 instant rebate for HPWHs applied when the installer purchases HPWH from a wholesale supplier, indicating a midstream model. However, a downstream program is proposed for HVAC heat pumps, including a multi-step customer enrollment process requiring customers to schedule a Home Energy Assessment (HEA), receive three heat pump quotes, potentially complete weatherization upgrades in advance, and wait 8-10 weeks to receive an incentive payment.

Comment: VEIC strongly supports the proposed midstream approach for HPWHs and recommends a midstream program for HVAC heat pumps as well. Transforming the market for heat pumps means making the heat pumps standard practice for HVAC distributors and contractors. Midstream programs allow the supply chain to stock and sell heat pumps as part of their standard business model, making it much easier for contractors and customers to participate. The downstream model proposed for HVAC heat pumps is unlikely to garner high participation and will limit the program's ability to effectively engage the supply chain and ultimately transform the market.



Contractor Training and Network

Contractor training and workforce development is key to support quality installation of heat pumps and build the workforce needed to electrify homes. Programs like Efficiency Vermont and TECH Clean California have found that qualified contractor networks support program success by providing a channel to offer technical and program trainings while helping well-trained contractors differentiate themselves in the market. These programs maintain websites that customers can search to find qualified heat pump contractors by zip code.

HHPP inclusion or gap: The HHPP program design includes incentives to support workforce training and related activities. It does not mention a qualified contractor network.

Comment: VEIC supports the inclusion of workforce development activities and incentives in the HHPP program design. We suggest expanding the proposal to include development of a qualified contractor network, potentially building on any networks already maintained by Rhode Island Energy. Efficiency Vermont's [Efficiency Excellence Network](#) is a good example of this strategy; the network includes trade groups for installers specialized in different types of heat pump equipment.

Robust Incentives and Financing

VEIC has found that generous incentives are needed to motivate fuel switching, especially from natural gas to heat pumps. Ideally, incentives (in the form of instant discounts at point of sale) are paired with integrated, streamlined financing to overcome first-cost barriers.

HHPP inclusion or gap: The program design includes robust incentives of \$1,250/ton for HVAC heat pumps. There is a brief mention of an option of 0% financing on eligible systems, but no details are provided.

Comment: The proposed incentive levels for HVAC heat pumps are appropriate and largely align with those offered in neighboring states like Massachusetts. We recommend offering similarly generous incentives for HPWHs of at least \$1,000 per unit, higher than the \$750 proposed. We also suggest providing more detail on the financing option and how it will be integrated into the contractor sales process to enable broad participation.

Program Coordination and Incentive Layering

When multiple programs operate in the same market, careful coordination is needed to streamline program participation and prevent market confusion. In Rhode Island, HHPP will layer onto the existing heat pump rebates provided through the utility energy efficiency programs.

The state of Rhode Island has been a national leader in utility energy efficiency programs since the passage of the Comprehensive Energy Conservation, Efficiency and Affordability Act in



2006.² Following the sale of the National Grid Rhode Island Utility to PPL,³ Rhode Island Energy has started to implement the 2021-2023 Energy Efficiency Plan. The plan states that “Air Source Heat Pumps will be emphasized... and we will also deploy multiple forward-looking strategies and innovations.” It also notes that “a priority is to drive comprehensive measure adoption with technology-based opportunities by expansion and promotion of the installation of air source heat pumps.”⁴ At this time, Rhode Island Energy’s heat pump rebates include relatively modest downstream rebates for central heat pumps, mini-split heat pumps, and heat pump water heaters (HPWH), plus enhanced rebates for heat pumps installed in homes with electric resistance baseboard heat.

HHPP inclusion or gap: The program design includes a short discussion of program coordination: “The Program Administrator will be required to leverage existing incentives in Rhode Island that can be layered with incentives from HHPP. For example, if HHPP provides a \$1,250/ton incentive, the program will be designed to utilize existing heat pump incentives through Rhode Island Energy, and layer SFRF funds to reach a total customer incentive of \$1,250/ton.”

Comment: The discussion of program coordination only addresses how tapping supplemental funds could reduce spending from the State Fiscal Recovery Fund (SFRF). We recommend braiding state, utility, and Weatherization Assistance Program (WAP) funding in a manner that allows for streamlined customer enrollment. This can be done by aligning marketing efforts, incentive processing, and eligibility requirements to the extent feasible. At minimum, the HHPP and the Rhode Island Energy program should have the same requirements for equipment eligibility, such requiring cold-climate air-source heat pumps from the NEEP list. Ideally, program participation steps would also be aligned. Requirements such as getting three quotes, mandating load calculations and requiring weatherization add a level of complexity that makes it more difficult to layer incentives. We recommend maintaining a streamlined program design, ideally through a midstream model, for the market-rate Residential Incentives and considering additional requirements only for the Enhanced Incentives for LMI customers and DACs.

Another strategy is to layer incentives in complementary ways. For example, OER might consider a midstream program to provide a baseline incentive offered by the heat pump distributors and applied as an instant discount before the product is sold to the installer or customer. This could

² Comprehensive Energy Conservation, Efficiency and Affordability Act.

<http://webserver.rilin.state.ri.us/Statutes/title39/39-1/39-1-27.7.HTM>

³ PPL purchase of National Grid RI. <https://www.prnewswire.com/news-releases/ppl-corporation-completes-acquisition-of-rhode-islands-primary-electric-and-natural-gas-utility-301555014.html>

⁴ National Grid 2021 – 2023 Energy efficiency Plan. http://rieermc.ri.gov/wp-content/uploads/2020/10/2021-23-ri-ee-three-year-plan_main-text-attachments_100120.pdf



be paired with an administration fee to the distributor to handle the point-of-sale incentive. In Vermont, incentives from Efficiency Vermont and multiple electric utilities are layered to maximize impact. Efficiency Vermont offers a \$400 baseline midstream incentive applied by heat pump distributors and passed through to customers as an instant discount. Distributors also receive an administration payment of \$25 per heat pump. Leveraging its statewide market transformation role, Efficiency Vermont leads Vermont's consumer education campaign and contractor training through the Efficiency Excellence Network. Additional utility offerings are layered on as downstream rebates; for example, Green Mountain Power offers an additional \$300 or \$600 rebate to LMI customers.

The ideal state would be to deliver all available rebates through one central incentive portal where customers and contractor could access both HHPP and Rhode Island Energy incentives with a single application. In California, the TECH initiative has created a central application portal that several utilities and other program administrators are now using to process their incentives alongside the TECH incentives.

Consumer Education Campaign

HHPP inclusion or gap: Consumer education and marketing is essential to drive consumer demand for heat pumps and raise awareness of the technology. The program design includes funding for a general outreach and education campaign.

Comment: VEIC strongly supports inclusion of a consumer outreach and education campaign and agrees with the importance of coordinating efforts with the utility, RI Infrastructure Bank, and other organizations across the state. California's [Switch Is On](#) campaign is a good example of a statewide campaign that is successfully driving customer interest in heat pumps. Notably, the Switch Is On website also allows customers to search by zip code for qualified contractors and available incentives in their area. In this way, the Switch Is On makes the participation process easy for customers despite the complexity of available offerings from dozens of programs in the state.

Enhanced Offerings for LMI Households and DACs

HHPP inclusion or gap: The program design includes an Enhanced Incentive pathway for LMI customers and DAC residents. This pathway requires right-sized equipment and weatherization in advance of heat pump installation. OER plans to deliver enhanced incentives through "organizations who have demonstrable experience providing efficiency services and support to low income and disadvantaged segments of the population."

Comment: VEIC strongly supports the inclusion of enhanced incentives for these households and communities, in alignment with Justice40 principles. We also support the plan to deliver



these incentives through organizations with existing relationships, and further suggest a “one-stop-shop” approach to provide wraparound services to these customers. Additional comments on weatherization requirements in the Enhanced Incentive pathway are provided below.

Other Comments

We would like to offer additional thoughts on the Community Incentive, as well as the specific questions posed by OER.

Community Incentive

VEIC supports the inclusion of a program to help community-based organizations and nonprofits install heat pumps; we have offered similar programs to nonprofits in Vermont. However, the budget allocated to this program is unclear. The table on page 4 lists the budget as \$5.23M while on page 8 it is shown as \$12M. We believe that a smaller budget allocation is appropriate given the challenges in reaching this customer segment. These customer types are very busy and may be difficult to recruit into the program. Even if they enroll, the heat pump solutions for commercial buildings at this point are often complicated and expensive, requiring custom engineering. Some building types, such as houses of worship, might not have sufficient hours of operation to justify the investment. Other organizations that currently heat with natural gas could experience increased operating costs (energy bills) if they switch to heat pumps, unless retrofits are conducted as part of very comprehensive projects that also include weatherization and solar.

Overall, we believe that OER should focus initially on using the HHPP for market transformation by allocating a larger share of the budget to the Residential Incentive program. Efforts for LMI households and DACs should be concentrated in the Enhanced Incentive pathway. A small allocation to the Community Incentive is appropriate to support flagship projects that generate positive press and community benefits, but this is likely to be a relatively small number of projects. We also suggest exploring whether Community Incentives could be targeted to provide air conditioning to organizations that support communities at risk of extreme heat, such as emergency cooling centers or homeless shelters in communities that are urban heat islands.

Weatherization and Equipment Sizing

VEIC appreciates OER’s desire to promote weatherization prior to heat pump installation, as well as right-sizing of installed equipment. We recommend a two-pronged approach to balance these goals with the imperative to rapidly transform the market for heat pumps.

Residential Incentives: For market-rate Residential Incentives, we believe that the top priority should be driving and scaling the heat pump market in a way that gets the state on a path to



shift nearly all residential heating system, cooling system, and water heater sales to heat pumps by 2030. Therefore, we recommend easing participation requirements and deploying a midstream program model. Weatherization should be highly encouraged, but not a requirement for a customer to access heat pump incentives. VEIC's experience with heat pump programs is that weatherization requirements present a major barrier to adoption and are difficult to implement. We have also found that when customers do one efficiency measure, they are likely to do another over time. We would recommend that the program offer a downstream bundling bonus or adder for weatherization measures performed with a heat pump installation within the last three years. In Vermont we have used a Vermont Residential Building Energy Standard (RBES) certificate, home performance program participation, or WAP participation to verify program eligibility for this type of adder.

Similarly, we believe that HHPP should promote and encourage proper sizing of heat pumps, but not require load calculations to prove the equipment is properly sized. Manual J or other load calculations are rarely performed by contractors and would drive up prices, presenting a barrier to participation. In California and Vermont, we are not seeing widespread mis-sizing of heat pumps. If this is a known issue in Rhode Island, the program could consider offering a downstream bonus or adder for incentive applications that provide a load calculation that caused the heat pump to be right-sized. In Vermont, we have tackled this by focusing on contractor training through the trade ally network, recognizing high-performance contractors with better training on equipment sizing through the Efficiency Excellence Network (EEN).

Enhanced Incentives: For LMI households in the Enhanced Incentive pathway, we believe the top priority should be supporting equitable outcomes and reducing energy burden. A downstream approach is warranted, both to make income verification feasible and to support comprehensive retrofits that include weatherization and health and safety measures. For LMI customers, it is very important to align services to offer heat pumps in tandem with weatherization, or target customers that have already weatherized. The reason for this is that, given current electricity and gas prices, heat pumps have the potential to increase operational costs for customers that switch from natural gas – particularly if they also add air conditioning to provide a comfort and health benefit. Pairing heat pumps with weatherization and solar is a key mitigation strategy to control these costs and requires a comprehensive approach.

VEIC has also found, through several California pilots targeting LMI households as well as a Low Income Decarbonization Pilot recently offered through the DCSEU, that homes occupied by lower-income households often require upgrades to address pre-existing health and safety problems before they can be electrified. To provide a sense of scale, a national occupant survey of the Weatherization Assistance Program (WAP) indicated that approximately 30% of audited



households are at least initially deferred.⁵ On top of this, many homes will also require electric panel or wiring upgrades to accommodate the additional load for heat pumps. To allow broader participation in the HHPP for LMI households, we suggest clarifying that health, safety, and structural repairs are an eligible program expense and allocating budget to pay for these improvements. We also recommend delivering Enhanced Incentives through a one-stop-shop approach via an organization, such as a Community Action Agency, that is in a position to braid available funding for electrification, heat pumps, and health and safety and manage installations on behalf of customers.

VEIC appreciates OER's consideration of these comments. We look forward to supporting Rhode Island's efforts to drive market adoption of heat pumps and are available to answer any questions you may have.

Respectfully submitted,

A handwritten signature in black ink that reads "Emily Levin". The signature is written in a cursive, flowing style.

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⁵ Oak Ridge National Laboratory, 2015. Exploratory Review of Grantee, Subgrantee and Client Experiences with Deferred Services under the Weatherization Assistance Program. https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRecoveryActEvalFinalReports/ORNLTM-2014_364.pdf