



DRAFT 1, VERSION 2.0 ENERGY STAR WATER HEATER SPECIFICATION

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Ms. Daken,

Thank you for the opportunity to provide comment on the latest draft revision to the ENERGY STAR Water Heaters Criteria (Version 2.0). After reviewing the Agency's first draft, Northeast Energy Efficiency Partnerships (NEEP) would like to provide a number of observations and recommendations as the Agency works to hone its approach for the next draft as well as larger, more programmatic considerations.

Northeast Energy Efficiency Partnerships ([NEEP](#)) is a non-profit organization that facilitates regional partnerships to advance the efficient use of energy in homes, buildings and industry in the Northeast U.S. NEEP works to leverage knowledge, capability, learning and funding through regionally coordinated policies, programs and practices. As a regional organization that collaborates with policy makers, energy efficient program administrators, and business, NEEP is a leader in the movement to build a cleaner environment and a more reliable and affordable energy system.

NEEP and several of the regions' programs have identified Heat Pump Water Heaters as a game changing technology that carries exciting energy savings possibilities. As has been the case with other exciting emerging technologies, there are potential pitfalls that may delay the market uptake of this product. In an effort to coordinate the various regional activities and help align strategies to accelerate the adoption of Heat Pump Water Heaters in the Northeast, NEEP recently organized a working group made up of energy efficiency program administrators in order to plot the best path forward. While we are interested in all product categories involved in the water heating criteria, we will be limiting our comments today to issues involving Heat Pump Water Heaters in the Electric Whole Home category.

Electric Whole Home Water Heaters

Based on recent experiences of several energy efficiency programs across the Northeast region, it has become evident that the most important issues involving the successful implementation of Heat Pump water heaters are as much in properly locating, sizing and installing these products as it is in the purchase of ENERGY STAR qualified heat pump water heaters. While there is some consensus that the technical specifications for ENERGY STAR qualification could be improved, having satisfied consumers, especially in colder climates has more to do with educating consumers, retailers, distributors and contractors on the nuances of this technology. Much like the ENERGY STAR program has developed a [quality installation protocol](#) for some HVAC products, a similar tool may be valuable for Heat Pump water heaters specifically, but would likely be useful for all types of water heaters.

The comments will be divided into two areas; Development of supplemental Installation guidance and Technical criteria considerations.

Development of Installation Guidance

- While ENERGY STAR is clearly aware of some of the installation pitfalls associated with Heat Pump water heater technology evidenced by their "[Buying guidance](#)" information on their website, this one paragraph is not nearly sufficient in raising these issues for consumers in general.
- NEEP envisions the potential development of an ENERGY STAR tool to help consumer/contractors in colder climates determine if their particular home is an appropriate fit for a heat pump water heater, where in the house is ideal and determining the right size water heater for their family's needs. Besides helping a consumer make some of these determinations, the tool could also include information about what to expect from a heat pump water heater, focusing on the differences between heat pump technology versus the incumbent electric resistance technology. Some of the factors are explained further below;
 - Determining ideal applications in colder climates
 - Is there an appropriate installation location in the house that will offer ambient air temperature sufficient to operate the heat pump water heater efficiently?
 - Can a condensate drain be made available?
 - Is there a sufficient volume/circulation of air in the installation location?
 - Determining an appropriately sized heat pump water heater for colder applications
 - In order to provide sufficient amounts of hot water to a family's needs, what metrics should consumers be considering?
 - Simply replacing a certain sized (in gallons) electric resistance water heater with a heat pump water heater may not be a wise assumption.
 - How should consumers use the current First Hour Rating to help determine water heater size?
 - The Northern Climate Specification includes a Northern Climate Delivery Rating that may offer a more intuitive measurement of a water heaters ability to delivery hot water (represented by number of showers in a row will be met by heat pump operation before moving over to electric resistance backup). This may mean a lot more to the average customer than a first hour rating.
 - Ensuring Consumers are aware/educated about heat pump water heater characteristics so that their expectations are realistic
 - Current heat pump technology relies on the use of audible compressors to operate. It should be made clear to consumers that this technology will produce a certain level of noise, especially when a consumer might be replacing an electric resistance unit with a heat pump water heater and assuming a quiet operation.
 - Heat Pump water heaters exhaust cold air. While consumers are largely accepting of this exhaust air into semi-conditioned spaces, it should not come as a surprise.

Technical Criteria Considerations

While you are well aware of the efforts to develop a more comprehensive suite of qualification metrics for northern climate products (through the Northern Climate Specification), at this time, we are not recommending a whole sale adoption of the latest Northern Climate Specification for Heat Pump Water Heaters. There are however a select number of performance liabilities that we can agree pose the



largest threats to consumer satisfaction in the Northeast and greater “northern” region. We strongly suggest the agency consider building new requirements into the next criteria for Electric Whole House or Heat Pump Water Heaters. Alternatively, ENERGY STAR could consider bi-national qualification requirements. Precedent for this type of region-specific criteria has been established by ENERGY STAR windows and furnaces.

- Northern Climate Energy Factor

The current measure of a heat pump water heater’s efficiency is determined by Energy Factor. Federal test procedures determine this level under conditions that are uncommon for heat pump water heater installations in the Northeast. Most installation locations of heat pump water heaters in the Northeast fall into semi-conditioned locations, such as basements or crawl spaces, where ambient temperatures are often cooler than the typical room temperature (as low as 50 degrees F) of conditioned spaces (defined by the DOE as 67 degrees F). A Heat pump water heater’s efficiency is affected by this difference in ambient air temperature. However some units handle this difference better than others. The current Energy Factor is unable to account for this potential difference.

As part of the Northern Climate Specification, NEEA has designed a slightly alternate version of Energy Factor called the Northern Climate Energy Factor by accounting for a cooler ambient air temperature during testing. We would support the consideration of using this metric when qualifying units for the Northern region.

- Condensate management

Managing condensate is an important consideration when installing heat pump water heaters. The ENERGY STAR Criteria could include some requirements that help minimize the potential problems that arise when condensate is not properly drained, such as automatic detection and communication to the consumer/operator.

- Extending Warranty

Extending the required warranty to 10 years would signal a real commitment to product quality. Many electric resistance products on the market offer 9 to 12 year warranties, much longer than the current 6 year requirement on ENERGY STAR Qualified heat pump water heaters.

- Following the completion of a heat pump water heater field testing pilot that efficiency program administrators are currently conducting in Massachusetts, additional issues may present themselves. These results will be provided to the ENERGY STAR team for their consideration and may warrant additional considerations for the ENERGY STAR Criteria.

The current ENERGY STAR Program for Heat Pump Water Heaters is falling short of its promise to consumers, more specifically those consumers in colder regions of the country. One of the key tenets of ENERGY STAR is that labeled products “deliver the same or better performance as comparable models while using less energy and saving money.” To imply, through lack of education, that this product is right for everyone is not accurate, especially for consumers in the colder climates.



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Because of the powerful reputation that ENERGY STAR labeling has built with consumers, we are concerned that simply labeling efficient products without providing the necessary consumer/installer education, may sacrifice the expected performance consumer are expecting from their heat pump water heaters.

We are concerned that labeling products that ultimately lead to consumer dissatisfaction will in fact harm the reputation of the technology in general and to an equal extent damage the reputation of the ENERGY STAR brand. In order to better serve consumers and the ENERGY STAR Program, we are suggesting that additional safeguards/requirements be added to the list of product qualification/installation measures.

We appreciate the challenge of creating a single set of technical requirements for a national program like ENERGY STAR. However, it is clear that there are regional issues with this product class and may require some guidance, at the very least, in order to fully realize the efficiency advantage. As mentioned above, precedent for region-specific criteria has been established by ENERGY STAR windows and furnaces.

By ensuring that ENERGY STAR Qualified products be installed in appropriate locations in colder climates like the Northeast, the various stakeholder across our region (including efficiency program administrators), can more confidently point to the ENERGY STAR label as a mark that lives up to its reputation of energy performance without sacrifice. This confidence will allow programs paralyzed by histories of product failures (due in some part to inappropriate applications) to reestablish strong promotional efforts around Heat Pump Water Heaters. Of course, the end goal of these efforts is to ensure a smooth market introduction of this next generation of Heat Pump Water Heaters and lay the groundwork for a complete market transformation.

Thank you for your consideration of these comments.

David Lis
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Northeast Energy Efficiency Partnerships