

November 20, 2017

Ms. Abigail Daken  
US Environmental Protection Agency  
1200 Pennsylvania Ave., NW  
6202J  
Washington, DC 20460-0001  
United States  
Dear Ms. Daken:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the *Draft 1 Version 2.0 ENERGY STAR® Commercial Water Heaters specification*, released by the Environmental Protection Agency (EPA) on October 12, 2017.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces. In 2015, CEE members directed nearly \$7 billion of the \$8.7 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so it may continue to serve as the national marketing platform for energy efficiency.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

## **CEE agrees that labeling high efficiency commercial electric water heaters can overcome low consumer awareness of such options.**

CEE member and US Department of Energy lab testing, field testing, and related performance modeling of commercial heat pump water heaters has demonstrated that, compared to electric

resistance water heaters, heat pump water heaters in well-designed and installed systems can save customers energy. Electric resistance water heaters cannot achieve efficiency greater than 100 percent, whereas in-field efficiency performance of heat pump water heaters has ranged from about 150 to over 300 percent. Modeling by the US DOE Building America Program extending field performance data of a heat pump water heater installed in a student apartment building to six US climates estimated energy savings of 49 to 59 percent and a payback of six to ten years compared to an electric resistance base case. Other field demonstrations have also found that the payback period of heat pump water heaters compared to an electric resistance base case extends beyond five years, however, in multiple studies the long payback period was attributed to high installation costs due to a lack of contractor familiarity with the technology.

Our understanding is that uptake of high efficiency electric water heaters is very low, and we believe that ENERGY STAR can help address barriers related to low awareness of high efficiency options. With greater uptake of high efficiency water heaters, contractor familiarity may increase and drive down the installation costs, leading to improved cost-effectiveness. Given the significant energy savings potential compared to electric resistance water heaters and the potential for cost-effective savings with increased uptake lowering installation costs, we support EPA expansion of the specification scope to include high efficiency commercial electric water heaters, subject to the additional considerations outlined below.

## **The ENERGY STAR label is necessary but not sufficient: CEE recommends that EPA consider near- and longer-term options for addressing system performance risks related to suboptimal system design, quality installation, and quality maintenance.**

Our understanding is that in addition to low consumer awareness of heat pump water heaters, a lack of familiarity among water heating system designers, specifiers, installers, technicians, and maintenance staff is also impeding the uptake of high efficiency electric water heating systems. These groups perform functions that are critical to achieving the desired energy performance, reliability, and cost-effectiveness of heat pump water heaters. Suboptimal system design, installation, and maintenance can lead to poor system performance, which could negate the energy savings that ENERGY STAR labeled equipment promises and undermine the ENERGY STAR brand. While CEE member program administrators have indicated that they plan to support program customers with design and installation in the near-term, this is neither a long-term solution nor a solution available to all customers across the US.

We recommend that EPA consider near- and longer-term options for supporting partners with system design, quality installation, and quality maintenance. Near-term options include making it mandatory for heat pump water heaters to offer functions that notify customers, maintenance

staff, manufacturers, or technicians when a system is not performing as expected through fault detection, diagnostics, and performance reporting. In field tests, custom installed monitoring equipment performed these functions and helped customers and testers to become aware of, troubleshoot, and resolve system performance issues. Longer-term options include development of design, installation, and maintenance guidance for systems incorporating heat pump water heaters once these topics are better understood.

## **CEE recommends EPA assess the potential to include gas heat pump water heaters within the scope of the ENERGY STAR program.**

We are aware of two commercially available gas heat pump products at this time. It is our understanding that additional products are under development. Gas heat pumps promise significantly higher energy performance compared to standard and condensing water heaters. While these products are not currently within the scope of DOE mandated test procedures for water heaters, they may be able to be tested in a manner consistent with the DOE test procedures for heat pump water heaters or other gas water heating equipment.

## **CEE recommends EPA explore alternatives for defining heat pump products in a manner that can more effectively support consumers to maximize the potential benefits of heat pump products.**

It is our understanding that the Draft 1 specification excludes heat pumps that can perform both space conditioning and water heating functions. We are concerned that excluding such products may inhibit consumers from taking advantage of waste heat from cooling systems or use of free cooling from the water heating system. Use of waste heat and provision of free cooling can increase the combined energy efficiency of space conditioning and water heating systems. In the case of organizations with policies that encourage or require the purchase of ENERGY STAR equipment when available, limiting the application of the ENERGY STAR label to systems that only provide domestic hot water could result in suboptimal equipment selection in those applications where use of waste heat or free cooling is available. We recommend that EPA remove the exclusion related to heat pump water heaters that can also perform space conditioning functions.

## **CEE requests additional information regarding the eligibility of different types of heat pump water**

## heaters, and, for those that are excluded, a rationale for exclusion from the perspective of the consumer.

Based on the definitions in the draft specification, it is our understanding that the following heat pumps are not eligible for qualification:

1. Heat pump water heaters with an input rating of >12 kW that do not store water within the appliance with an integrated tank and deliver water at a thermostatically controlled temperature for delivery on demand.
2. Heat pumps that can operate not only as a heat pump water heater, but also provide additional space conditioning amenities should the customer's site offer an appropriate application.

In the case of the first category, we request clarification as to whether the exclusion was intentional and, if so, the rationale for the exclusion. We have identified multiple heat pump products without an integrated storage tank but with an input rating of >12 kW available on the market, and in the right applications, such products may offer better system performance or otherwise better meet a customer's needs compared to alternative designs using only the equipment eligible under the scope of the Draft 1 specification. We have also identified heat pump products that do not heat water to a thermostatically controlled temperature for delivery on demand but are instead intended to integrate into a system that further heats the water to the required use temperature, which could also offer better system performance or otherwise better meet a customer's needs compared to alternative designs using only equipment eligible under the scope of the Draft 1 specification. If the exclusion was not intentional, we recommend that EPA remove heat pump water heaters from being a subcategory of storage water heaters.

In the case of category two, we request clarification as to whether such equipment, if tested as a heat pump water heater, would be eligible. We outlined in the previous section the potential unintended consequences of excluding such equipment. If such equipment is in fact intended to be eligible, we request that EPA clarify this in the specification. We further recommend that EPA consider adding a reporting requirement for combined efficiency to help consumers understand the relative performance of multifunction equipment on the performance metrics relevant for their application.

CEE would once again like to thank EPA for the opportunity to comment on the *Draft 1 Version 2.0 ENERGY STAR® Commercial Water Heaters specification*. Please contact CEE Senior Program Manager Kim Erickson at [kerickson@cee1.org](mailto:kerickson@cee1.org) with any questions about these comments.

Sincerely,

A handwritten signature in blue ink that reads "Ed Wisniewski". The signature is written in a cursive style with a large, stylized "E" and "W".

Ed Wisniewski  
Executive Director