Consortium for Energy Efficiency

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March 26, 2021

Ms. Abigail Daken
US Environmental Protection Agency
Ariel Rios Building 6202J
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Daken:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to ENERGY STAR® Water Heater Product Specification Final Draft Version 4.0 released by the Environmental Protection Agency (EPA) on February 4, 2021.

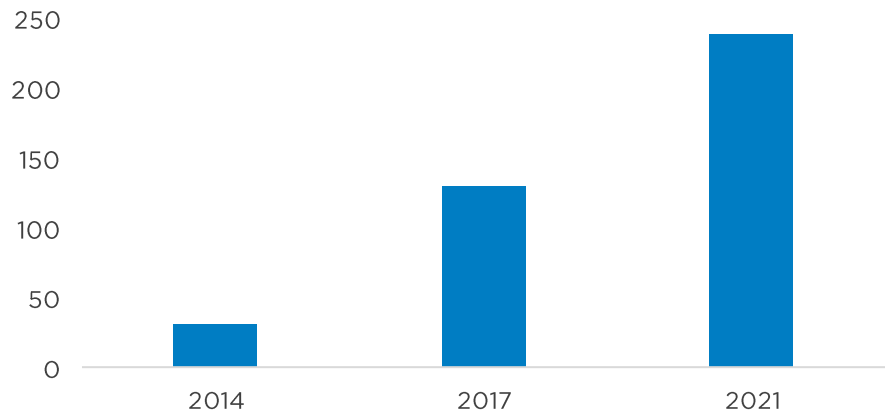
CEE is the binational organization of energy efficiency program administrators. Historically, the CEE Board of Directors determined to build a single brand for efficiency and elected to support standing for the ENERGY STAR® Program rather than advancing the name recognition of CEE or other endeavors that existed at that time. This was a conscious investment of equity, and the sanctioned obligations of utility members that include responsibility for delivering safe, reliable, and affordable service were embraced and well supported. Today, the staff and membership of the Consortium continue to perform diligence relative to the very serious obligations entrusted to US and Canadian utilities as well as others advancing voluntary market transformation efforts. CEE members are responsible for ratepayer-funded efficiency programs in 38 US states, the District of Columbia, and four Canadian provinces. In 2018, CEE members directed approximately 68% percent of the $8.9 billion in energy efficiency and demand response program expenditures in the two countries. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR in its service to the public interest, so ENERGY STAR may continue to serve as a preeminent marketing platform in North America. CEE values the role the Program plays to differentiate energy efficient products and services.

CEE Supports Increased Performance Levels for Heat Pump Water Heaters

CEE members continue to invest in heat pump water heaters (HPWHs) as suggested by the number of programs that have launched in the past decade and continue to operate today. As of 2020, there were 58 CEE members with active residential HPWH programs and over half of these launched in the past five years.[1] These products offer a significant savings opportunity. According to analysis conducted by the Pacific Northwest National Laboratory (PNNL), the energy savings from replacing conventional electric resistance water heaters with HPWHs are up to 63 percent.[2]

Industry has responded to the opportunity. The availability of HPWHs has increased significantly in recent years. The number of HPWH models available and listed in the CEE Directory has seen rapid growth. Seven years ago, the total number of unique heat pump water heaters was 30; today that number is 238, as shown in Figure 1.

Figure 1. **Number of Available HPWH Models in the Unites States**[3]



While the poorest performing heat pump water heater is rated to perform above that of an electric resistance water heater, CEE notes that the average rated performance of HPWH models available in the market has significantly increased over the past few years,

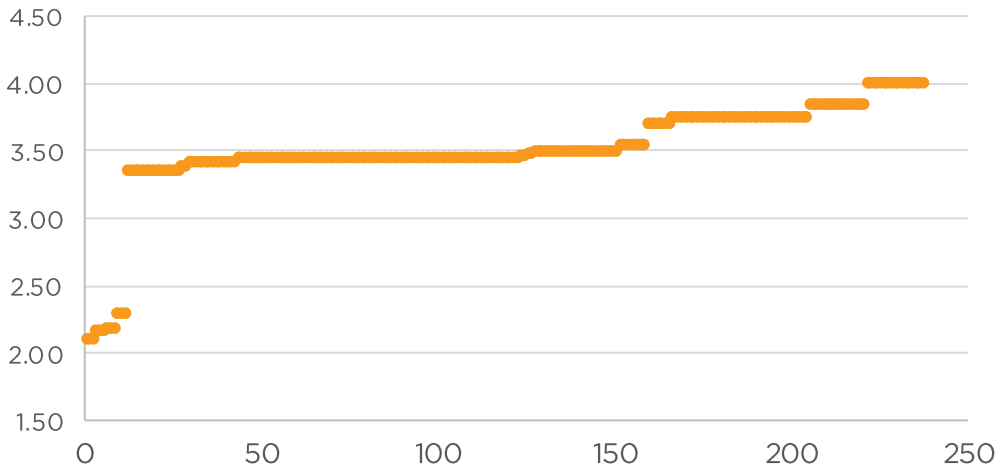
[1] The jump in member establishment of HPWH programs in 2014 may be partially attributed to 1) the DOE federal standard finalized in 2010 and effective April 2015, and 2) the ENERGY STAR Version 3.0 release in June, 2014.

[2] 3 S. H. Widder, G. B. Parker, J. M. Petersen, and M. C. Baechler, "Impact of Ducting on Heat Pump Water Heater Space Conditioning Energy Use and Comfort," Pacific Northwest National Laboratory, 2014, pg. 17, http://www.pnnl.gov/main/publications/external/technical_reports/pnnl-23526.pdf

[3] CEE Directory of Efficient Equipment: http://ceedirectory.org/site/1/Home. Accessed March 4, 2021.

since the publication of ENERGY STAR Version 3.0. Figure 2 provides a summary of the UEF values of the 238 currently available HPWH models.

Figure 2. **UEF Levels of Available HPWH Models in the Unites States**[4]



Aside from 28 models, all available HPWHs have a UEF of 3.30 or higher. EPA confirms that most of these products – HPWHs over 55 gallons with a UEF below 3.30 – will be leaving the market by the effective date of the specification. The revised specification proposed in the Final Draft will therefore distinguish nearly all HPWH models currently available in the market, which represent the top performing electric water heaters in the market. Lowering the UEF requirement below 3.30 does not appear to have a meaningful impact on product availability, and the 3.30 level differentiates the most efficient electric water heaters available. In future iterations of ENERGY STAR, it may become appropriate to EPA to differentiate the most efficient heat pump water heaters, but at this stage CEE supports a level that yields significant savings while maximizing available qualified products.

CEE supports EPA's intent to raise the minimum efficiency levels for electric water heaters to 3.30 UEF.

According to EPA's analysis, electric water heaters less than 55 gallons that meet the proposed 3.30 UEF will yield annual electric energy savings exceeding 2,500 kWh/year and annual cost savings exceeding $300/year (relative to the federal minimum performance for electric water heaters). This savings opportunity above standard

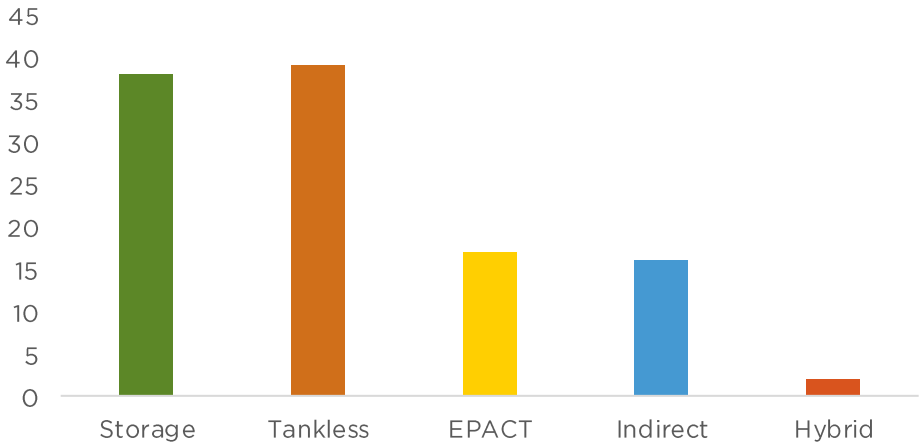
[4] Ibid.

efficiency products available in the market aligns with members' interest in having a platform through which they can promote high efficiency products widely available from several manufacturers while maximizing savings above baseline.

An ENERGY STAR Label for Gas Water Heaters Is Valuable to Natural Gas Program Administrators and Their Customers

The ENERGY STAR label for both gas tankless and gas storage units provides a meaningful mechanism for CEE members to promote cost-effective, high performing products in their service territories. A total of 44 CEE members currently run natural gas water heating programs[5] and plan to continue these offerings in future years as they transition to more efficient technologies, such as gas heat pumps. Figure 3 shows the breakdown of natural gas water heating products promoted through member programs in 2019.

Figure 3. **Natural Gas Water Heating Programs Offered by CEE Members (2019)**[6]



Natural gas program administrators applaud EPA's proposal to retain labeling of efficient gas water heaters since most CEE members have invested their good names and ratepayer funding relying upon the Program's brand promise. Their significant investment and equity has been entrusted to those who are privileged to operate the Program, and

[5] Consortium for Energy Efficiency. *2019 CEE Residential Water Heating Program Summary*. October 2020.
[6] Ibid.

eliminating the label would be a disservice to the Program, customers and those who arguably built the success of the Program. Additionally, the previous proposal to suspend the label for this category of equipment would be very disruptive to program operations let alone forgo differentiation of the 7-14% savings represented by labeled products.

We are pleased to see that EPA proposes to continue labeling gas water heaters through this revision process and appreciate the acknowledgement that these products deliver energy savings in the market.

The ENERGY STAR Program Provides an Important Carrot for Gas Heat Pump Technology

Natural gas efficiency program administrators, the Gas Technologies Institute (GTI), CEE's Emerging Technology Collaborative, and other interested organizations have conducted several years of investigation about the savings potential afforded by gas heat pumps. These positive findings have led to an even larger investment in supporting the successful commercialization of gas heat pumps for space conditioning and water heating in North America. Manufacturers indicate residential water heaters employing a gas heat pump will be available in North America within two years, and such products will likely warrant distinction through ENERGY STAR. While there are not currently any residential water heaters employing a gas heat pump available for sale in the United States, field demonstrations of prototypes indicate that this technology represents a viable savings measure for residential water heating. The ENERGY STAR label is expected to be an appropriate tool to differentiate these efficient products when available and in adherence with the Program's brand tenets. In the event that not all tenets of ENERGY STAR are met initially, the ENERGY STAR Most Efficient recognition is the relevant interim mechanism for distinction given the products represent large energy savings but may have longer payback periods or be offered by a limited number of manufacturers. We acknowledge that incumbent gas water heating technologies are approaching theoretical limits of efficiency and increases in minimum efficiency standards have diminished the ability for programs to achieve incremental savings. Gas heat pumps present a significant opportunity to increase efficiency.

CEE Supports EPA's Specification of Protocols for Open Standards that Enable Grid and Customer Benefit

As noted in previous comments, CEE is a staunch supporter of open standards because they can help enable greater flexibility and value to utility systems and potentially forego substantial T&D system costs for ratepayers. Connected devices have the potential to support a broad range of customer amenities in addition to enabling new energy savings and load management benefits. Members are interested in leveraging connected water heaters to automate demand response, enable consumer management of energy use (at times in response to varying rates), and/or authorize utilities or sanctioned third parties to administer equipment on their behalf to improve the economic and environmental operation of utility systems. Open standards are a critical pillar of the CEE Integrated Home Initiative, which specifies the US and Canadian model for efficient products and systems to effectively communicate to enable new customer, utility system, and societal value. The Initiative espouses the critical obligations of utilities across the United States and Canada to provide safe, reliable, and affordable energy service while advancing an efficient and decarbonized energy future.

We therefore support EPA's proposal that products achieving ENERGY STAR recognition as "connected" are capable of communicating using open, non-proprietary means from within the customer's premises as one pathway to connect. The potential benefits stemming from connectivity and automation of water heaters can increase if customers are given choice. This approach allows those sanctioned by regulatory authorities to enable new grid and energy management services without necessitating reliance on a proprietary cloud, while enabling manufacturers to participate or provide additional value-added services. CEE supports additional means for achieving connectivity, including proprietary cloud-based solutions that can provide additional amenities. Offering multiple means of participating in voluntary demand-side management programs is in the best interest of customers. CEE members strongly oppose the use of ENERGY STAR for products that limit choice such as those making use of only a proprietary cloud-based connection that is not maintained by a sanctioned market actor responsible for supporting safe, reliable, affordable, and efficient service.

CEE Supports EPA Requiring A Modular Interface Based on an Open Standard Communication Protocol (Such as ANSI/CTA-2045) to Enable Grid Benefit and Customer Flexibility

Since 2012, CEE and CEE members have been supportive of ENERGY STAR specifying connectivity requirements that enable direct, on-premise, open standards-based connectivity using the physical and data-link layers of an industry-accepted, modular communication interface such as ANSI/CTA-2045. Water heaters that possess such an interface (when coupled with a relevant demand response program offering) are expected to be capable of delivering desired grid benefit independent of where they are installed due to their ability to incorporate a diverse set of connectivity options across North America. Utilities and others sanctioned to manage the grid make use of a variety of load management strategies and associated communication standards.

ENERGY STAR's recognition of equipment that incorporate an ANSI/CTA-2045 socket will help ensure water heaters manufactured for sale in North America may be able to contribute to a more reliable, lower cost, and efficient utility system. However, we recommend EPA go further and require such a modular interface within the connected criteria.

In some jurisdictions, OpenADR 2.0b is a critical application layer for enabling load management, and water heater manufacturers that embed this protocol could avoid the need to supply a separate ANSI/CTA-2045 module. However, OpenADR 2.0b will not prove sufficient to meet the diverse grid conditions across the US and Canada and should not be considered an adequate substitute for ANSI/CTA-2045. We support EPA's acknowledgement in the current proposal that both ANSI/CTA-2045 and OpenADR 2.0b serve important objectives. However, we recommend that EPA require a modular interface based on an open standard (such as ANSI/CTA-2045) and provide additional recognition for systems that also embed OpenADR, eliminating the need for an after-market communication module in some jurisdictions.

EPA's Proposed Demand Response Requirements are Consistent with CEE's Specification, and Provide a Comprehensive Strategy for Load Management

Greenhouse gas reduction through demand flexibility is key to ensuring a reliable energy system in a low carbon economy. The Connected Product Criteria for ENERGY STAR water heaters sufficiently addresses these objectives, and we commend EPA for being inclusive of utility industry objectives through an approach that aligns with CEE's vetted connected criteria. Further, we note that there is an effort underway to establish a unform standard for demand response through the AHRI 1430 Working Group. EPA's work appears to be consistent with that of the Working Group and it is CEE's hope and intention that such a standard can serve as a single source and refence point for testing and certifying demand response capabilities (and be recognized as meeting CEE member needs). In the interim, CEE supports EPA's proposed connectivity and demand response requirements which reflect CEE's consensus position.

CEE Supports Introduction of New Water Heater Categories that Save Energy and Reduce Installation Barriers

The inclusion of two promising new categories – Integrated HPWH, 120 Volt / 15 Amp Circuit, and Split-system HPWH – will require active monitoring of the market entrants after Version 4.0 of the specification is finalized. CEE members do not presently have adequate data to evaluate the proposed performance levels set forth for the first time in this proposal. Should these additional categories be included within the revised specification, we would be interested in better understanding the in-field performance of available products relative to their laboratory performance ratings to ensure that ENERGY STAR labeled products offer consumers a consistent value proposition with regard to brand tenets.

CEE would once again like to thank EPA for the opportunity to comment on ENERGY STAR® Water Heater Product Specification Final Draft Version 4.0. Please contact CEE Senior Program Manager Alice Rosenberg at 617-337-9287 with any questions about these comments.

Sincerely,

Ed Wisniewski
Executive Director