AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
we make life better®

2311 Wilson Boulevard Suite 400 Arlington VA 22201 USA
Phone 703 524 8800 | Fax 703 562 1942
www.ahrinet.org

September 13, 2024

Ms. Abigail Daken
Manager, ENERGY STAR HVAC Program
United States Environmental Protection Agency
Washington, DC 20460

(Submitted via email to HVAC@energystar.gov)

Re: AHRI Comments in Response to ENERGY STAR® *Commercial Heat Pump Water Heaters Discussion Guide and Draft 1 Test Method for Central Heat Pump Water Heater Systems* – Draft Proposal Issued July 31, 2024

Dear Ms. Daken:

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) respectfully submits this letter in response to the ENERGY STAR Commercial Heat Pump Water Heaters Discussion Guide and Draft 1 Test Method for Central Heat Pump Water Heater Systems published on July 31, 2024.

AHRI is the trade association representing over 330 manufacturers of heating, ventilating, and air-conditioning equipment, commercial refrigeration equipment, and water heaters. It is an internationally recognized advocate for the heating, ventilation, air conditioning and refrigeration (HVACR) and water heating industry and certifies the performance of many of the products manufactured by its members. In North America, the annual economic activity resulting from the HVACR industry is more than $211 billion. In the United States alone, AHRI member companies, along with distributors, contractors, and technicians employ more than 704,000 people.

GENERAL COMMENTS

AHRI appreciates the opportunity to provide feedback on the ENERGY STAR Commercial Heat Pump Water Heaters Discussion Guide and Draft 1 Test Method for Central Heat Pump Water Heater (HPWH) Systems. AHRI understands and supports the goals of improving energy efficiency and standardizing performance metrics. However, after reviewing the proposal, we have identified several concerns and questions that we believe are critical to address to ensure the successful implementation and practical application of the program.

AHRI also recommends U.S. Environmental Protection Agency (EPA) pause development of specific test conditions or final performance metrics for commercial HPWH systems while amendments to AHRI 1300[1] continue.

Complexity and Variability of Commercial Heat Pump Water Heating Systems

The proposed approach suggests testing each component (e.g., heat pumps, storage tanks, and pumps) individually, with the results used to calculate overall system efficiency. AHRI recognizes

[1] ANSI/AHRI Standard 1300-2013, ("ANSI/AHRI 1300-2013"), Performance Rating for Commercial Heat Pump Water Heaters, approved by ANSI on October 1, 2013.

that ENERGY STAR is still developing the methodology that would be used to integrate these subcomponents into an overall system efficiency, as well as the certification framework that would be used to verify compliance with a future updated specification. Commercial Heat Pump Water heating (HPWH) systems involving split HPWH are highly variable and often custom-engineered to meet specific project requirements. Unlike integrated products, which can be more easily standardized and tested, split systems involve a wide range of components that may be pre-engineered or entirely custom-designed for each installation.

Although ENERGY STAR has not yet outlined these specifics in detail, AHRI has significant concerns that such an approach could result in an overwhelming amount of administrative, testing, and certification burden given the diversity and custom nature of these systems. AHRI encourages EPA to explore methods that enable a more integrated approach, making it easier to compare products and technology directly.

While AHRI recognizes that ENERGY STAR may see value in establishing certifications for "common configurations," AHRI has concerns that this approach may lead to custom designed systems being excluded from qualification for ENERGY STAR and may prevent them from being included in rebates tied to the ENERGY STAR program. As manufactures will not have line-of-sight as to what was ultimately installed into a building, AHRI requests clarification regarding how custom systems will be handled, and who will be responsible for certifying such a system.

We urge ENERGY STAR to consider these practical implications and explore ways to accommodate custom-engineered systems in a way that does not cause unnecessary administrative or certification burden.

Storage Tanks

One of the key challenges in the proposed approach is the requirement for standardized testing and certification of Unfired Hot Water Storage Tanks (UFHWST), particularly custom tanks. A significant portion of storage tanks are custom-designed to meet specific project requirements. These custom tanks can vary widely in dimensions, fittings, and insulation, all of which can impact performance characteristics such as heat loss. As the EPA is aware, UFHWSTs energy conservation standards are based off a minimum R-value and do not undergo standby loss testing to certify compliance with the U.S. Department of Energy (DOE) energy conservation standards. Testing each UFHWST including custom tank design for system efficiency would be impractical and costly. AHRI urges EPA to explore alternative pathways that achieve the same goals while limiting burden on manufacturers. For example, leveraging existing certification information on these products or utilizing software-based solutions to quantify performance.

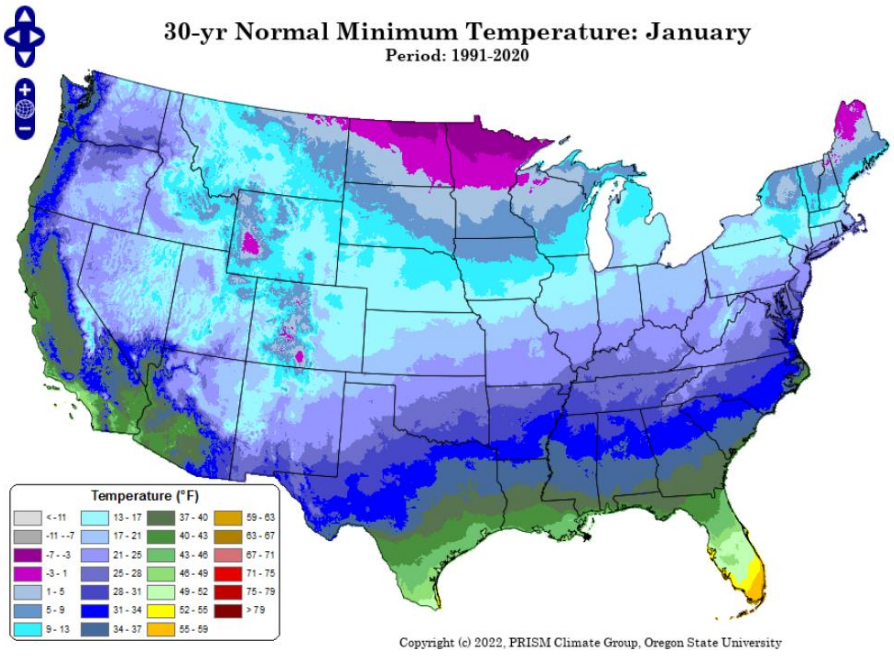
AHRI recognizes that in the minor changes to an UFHWST tank design, such as moving a fitting or altering tank dimensions, may impact standby loss performance but notes that these selections are often done to accommodate the needs of the specific installation. Regardless of these minor changes, standby-losses will ultimately be a function of the R-Value of the tank. Therefore, AHRI recommends that rather than requiring detailed testing of every custom tank and system configuration, EPA consider focusing on more straightforward metrics, such as R-value for insulation. This could provide a reasonable estimate of performance without the need for extensive testing, which would limit certification and testing burden on manufacturers as information from existing certification databases could be leveraged.

Test Set-Up

AHRI disagrees with EPA's proposal that Commercial HPWHs (CHPWH) that offer ducting configurations must be tested in the ducted configuration. Nor does AHRI believe that these products should require testing in both configurations. These requirements will ultimately promote the creation of additional individual models that are "ducting specific" that will lead to SKU proliferation, increase complexity, and potentially limit availability for those customers who need ducting based on their specific installation considerations. AHRI recommends grouping similar designs into the same basic model group. Requiring separate testing and certification for each variation creates an unnecessary additional burden on manufacturers.

Test Conditions – Air Source Central HPWHs

The evaporator entering air temperatures in EPA's proposal seem to overly focus on extreme high and low temperatures, which does not represent where a CHWPH would operate most of the time nor where the likely minimum point of interest may be. AHRI recommends that the EPA re-evaluate these conditions and consider adjusting the test points to better reflect the temperatures where the majority of operation occurs and temperatures of interest. For example, there is a significant gap between the 50°F and 17°F test points that should be addressed. As the proposal stands, a future seasonal efficiency metric based on these test conditions might fail to distinguish between a product with a minimum ambient air temperature of 49°F and one with a minimum of 25°F. The map[2] below, showing the 30-year normal minimum temperature by region in the United States, indicates that the relevant minimum temperature for most regions falls between 17°F and 50°F.



Heat pumps covered by AHRI Standard 210/240[3] are not tested below 17°F at low temperatures. For heat pumps specifically designed for cold climates, additional specifications and programs, such

[2] https://prism.oregonstate.edu/normals/
[3] AHRI Standard 210/240-2023 (2020), Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment.

as the Northeast Energy Efficiency Partnerships (NEEP) and the DOE Cold Climate Heat Pump (CCHP) Challenge, have been developed to address this particular market need.

AHRI appreciates DOE's continued participation on the AHRI 1300 Standard Working Group and encourages reference to AHRI 1300[4] in any program under consideration for CHPWHs.

Seasonal Metric for Heat Pump Units and AHRI Standard 1300[5]

AHRI requests EPA and DOE to not move forward in developing a seasonal metric for heat pump units outside of AHRI's open standards development process. The AHRI 1300 Standard Working Group will be addressing the seasonal metric items EPA and DOE identified in the draft test method. AHRI encourages DOE's continued participation during the development of a seasonal metric in the AHRI 1300 Standard Working Group. The water heating market is not accustomed to seasonal metrics and developing such metrics hastily, without proper input from all stakeholders, could lead to confusion in the market.

AHRI appreciates the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

Nicole Colantonio
Director, Regulatory Affairs
Direct: (703) 600-0332
Email: ncolantonio@ahrinet.org

[4] ANSI/AHRI Standard 1300-2013, ("ANSI/AHRI 1300-2013"), Performance Rating for Commercial Heat Pump Water Heaters, approved by ANSI on October 1, 2013.
[5] *Id.*