

Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy

August 2, 2023

Abigail Daken
EPA Manager, ENERGY STAR HVAC Program
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: ENERGY STAR Residential Boilers Discussion Guide, New Specification for Air-to-Water Heat Pumps

Dear Ms. Daken,

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP) and American Council for an Energy-Efficient Economy (ACEEE) on the U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE) proposal to develop a new test procedure and ENERGY STAR specification for air-to-water heat pumps (AWHPs). We appreciate the opportunity to comment.

We support EPA's proposal to develop a new specification for AWHPs. While hydronic systems are the main heating means in only 8% of U.S. homes overall, they are the primary heating means for 27% of households in the Northeast.¹ State policies, market and technology maturation, and emissions reduction imperatives are likely to continue motivating a shift towards high efficiency electricity-based heating. Launching a new specification for AWHPs would help this transition from gas and oil heating equipment to efficient electric alternatives. Furthermore, AWHPs are a well-established product type in Europe and Asia and are becoming increasingly available in the U.S.

We strongly support EPA and DOE's efforts to establish a representative test procedure for AWHPs. In DOE's final rule for test procedures for consumer boilers, the Department concluded that AWHPs meet the definitional criteria to be classified as a consumer boiler.² However, DOE determined that they are not subject to the current DOE standards for consumer boilers due to the lack of an applicable federal test procedure. In addition to supporting the development of an ENERGY STAR specification, developing a representative test procedure and performance metrics for AWHPs would enable consumers to have access to efficiency ratings based on a

¹ <https://www.eia.gov/consumption/residential/data/2020/hc/pdf/HC%206.7.pdf>.

² 88 Fed. Reg. 15516. (March 13, 2023).

standardized test procedure and could allow for potential Federal energy conservation standards in the future. Thus, we strongly support these efforts by EPA and DOE.

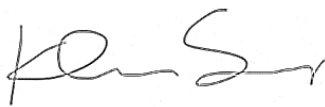
In the discussion guide, EPA notes that the Efficiency Vermont Rebate Program and the ENERGY STAR Emerging Technology Award tested AWHPs based on AHRI 550/590.³ AWHPs are more common outside of the U.S., especially in Europe. Therefore, in addition to considering AHRI 550/590, we encourage EPA and DOE to consider European standards such as EN 14511 and EN 14825, which is meant for testing at part-load conditions.

The test procedure should adequately capture part-load operation. AWHPs are often designed with variable-speed compressors which allow them to run more efficiently during part-load operation.⁴ Similar to other heating and cooling equipment, we would expect that AWHPs would operate most of the time at part load. Accordingly, the test procedure should adequately capture part-load operation in order to appropriately reflect how the equipment runs in the real-world. In addition, a test procedure that includes part-load operation would capture the benefits of technologies that improve part-load efficiency such as variable-speed compressors.

The test procedure should incorporate testing at 5°F. According to the Energy Information Agency (EIA), over half of all hydronic systems that are used as primary heating in the U.S. are located in cold or very-cold climate regions.⁵ Therefore, information about the performance and capacity at cold temperatures would assist consumers and contractors in cold climates in purchasing equipment. Requiring testing at 5°F would also allow EPA to consider establishing metrics for cold climate performance as they do for air-to-air heat pumps.

Thank you for considering these comments.

Sincerely,



Kanchan Swaroop
Senior Technical Advocacy Associate
Appliance Standards Awareness Project



Michael Waite, Ph.D., P.E.
Senior Manager, Buildings Program
American Council for an Energy-Efficient Economy

³ ENERGY STAR Residential Boilers Discussion Guide.

https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Residential%20Boilers%20Discussion%20Guide%200.pdf?_gl=1*103ldb1*ga*MTAwNjkzMjcyOS4xNjcwNDI3MzMw*_ga_S0KJTVVLQ6*MTY4NTk4ODU4Ny4yODEuMS4xNjg1OTg5MzA5LjAuMC4w.

⁴ See Mass Save's Residential Heat Pump Qualified Product List for AWHPs. Almost all models certified by Mass Save use variable speed compressors. https://www.masssave.com/-/media/Files/PDFs/Save/Residential/AWHP_QPL.pdf.

⁵ <https://www.eia.gov/consumption/residential/data/2020/hc/pdf/HC%206.6.pdf>.