

Appliance Standards Awareness Project  
American Council for an Energy-Efficient Economy  
Natural Resources Defense Council  
Rewiring America  
RMI

December 13, 2021

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® Light Commercial HVAC Version 4.0 Draft 1 Specification**

Dear Ms. Daken,

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), the American Council for an Energy-Efficient Economy (ACEEE), the Natural Resources Defense Council (NRDC), Rewiring America, and RMI on the Light Commercial HVAC Version 4.0 Draft 1 Specification released on November 1, 2021. We appreciate the opportunity to comment.

**We support the proposed expanded scope of covered equipment and the updated energy efficiency requirements.** We support the reinclusion of “very small” commercial unitary air conditioners (CUACs), commercial unitary heat pumps (CUHPs), variable refrigerant flow (VRF) air conditioners (ACs), and VRF heat pumps (HPs) in the ENERGY STAR light commercial HVAC scope. The “very small” equipment category is a large segment of the market, with almost 50,000 models listed in the DOE Compliance Certification Database. When this category was removed from an earlier version of the light commercial ENERGY STAR specification, it was not eligible for any other ENERGY STAR specification, leaving potential energy savings unrealized. According to EPA’s analysis, over their lifetime, “very small” CUACs and CUHPs meeting the proposed v4.0 criteria would on average save 6,460 kWh and 3,808 kWh, respectively. With the large volume of shipments, the reintroduction of the “very small” equipment category into the ENERGY STAR scope represents significant potential savings.

We also largely support the proposed updated energy efficiency criteria for CUACs and CUHPs. With new federal energy efficiency standards taking effect in 2023 for “small” and “large” CUACs and CUHPs, this ENERGY STAR update is important to continue to recognize high-performing equipment. However, while EPA has proposed IEER levels for CUACs and “large” CUHPs equivalent to Efficiency Level (EL) 4 from the 2016 DOE final rule, the proposed IEER level for “small” CUHPs (16 IEER)<sup>1</sup> is significantly lower than that corresponding to EL 4 (18.8 IEER). We encourage EPA to consider adopting the EL 4 IEER levels for “small” CUHPs, which would provide consistency across product types and capacities. Furthermore, in

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<sup>1</sup> For equipment with a heating section type of “Electric Resistance (or None).”

general, smaller-capacity equipment can meet higher IEER levels than larger equipment, so it would seem to make sense for the IEER levels for “small” CUHPs to be higher than those for “large” equipment.

Finally, we support a requirement for burner staging for gas/electric package units. Gas furnaces in gas/electric package units are currently not addressed by ENERGY STAR. According to DOE, staged or modulating combustion can significantly reduce annual energy consumption by reducing on/off cycling.<sup>2</sup>

**We support the introduction of the ENERGY STAR Cold Climate designation for CUHPs and VRF HPs.** This new ENERGY STAR Cold Climate labeling would follow EPA’s actions for residential equipment, allowing commercial customers in colder climates to select equipment that performs well in their climate zone. To support national decarbonization goals, it is important for EPA to identify heat pumps that are high performing in cold ambient temperatures to help drive the market to efficient electric heating options. We also agree with EPA’s initial determination that capacity maintenance at low temperatures is more important than a higher coefficient of performance (COP), which is reflected in the proposed v4.0 Cold Climate criteria. In particular, we understand that most current CUHPs will require a source of backup heating in cold climates (either electric resistance or fossil fuel). Therefore, we believe that emphasizing capacity maintenance makes sense in order to reduce the amount of backup heating required, and to encourage the expansion of cold climate heat pump offerings that do not require backup heat.

**We encourage EPA to consider ways to promote the development of light commercial heat pumps that perform well at very cold ambient temperatures.** The introduction of heat pumps that perform very well at both cold and very cold ambient temperatures will support decarbonization goals by reducing the need for backup heating. In a recent notice of proposed rulemaking (NOPR), DOE proposed to harmonize the test procedure for three-phase air-cooled “very small” CUACs and CUHPs with the test procedure for their single-phase counterparts (“Appendix M1”). Appendix M1 includes an optional 5 degree F test point. Once DOE finalizes the test procedure for three-phase equipment, we urge EPA to consider updating the Cold Climate designation for “very small” CUACs and CUHPs to include performance at 5 degrees F. We also encourage EPA to consider adding criteria for capacity maintenance and COP at 5 degrees F in a future specification for other types of light commercial heat pumps.

**We support EPA’s plans to introduce a controls verification procedure (CVP) in the future.** A CVP helps ensure that energy performance metrics reflect how the equipment operates in the field, with its native controls. Including a CVP will thus better ensure that the expected energy savings from the ENERGY STAR specification are being realized.

In the ENERGY STAR central air conditioner and heat pump equipment v6.0 specification, EPA developed a CVP requirement for cold climate certification of residential heat pumps based on the optional 5 degree F test point in Appendix M1. As described above, once DOE finalizes the test procedure for three-phase equipment, we urge EPA to consider updating the Cold Climate designation for “very small” CUACs and CUHPs to include performance at 5 degrees F. Such a change would also allow EPA to extend the use of the CVP that it developed for residential equipment to “very small” CUACs and CUHPs. For “small” and “large” equipment, for which there is currently no CVP, we encourage EPA to develop one, as it has for residential equipment.

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<sup>2</sup> <https://www.regulations.gov/document/EERE-2013-BT-STD-0021-0050>. p. 4-4.

In another recent NOPR, DOE proposed an updated test procedure for “small” and “large” VRF multi-split systems. This proposed test procedure is modified from AHRI 1230-2021. While the industry standard specifies a CVP, it does not specify when it should be conducted. DOE has proposed to adopt the CVP as part of product-specific enforcement rather than as part of the test procedure. A CVP is of particular importance to VRF equipment. The California IOUs conducted testing of VRF systems and found that dynamic and dynamic load-based tests resulted in measured efficiencies (EER) across a range of load points that were 45 to 65% lower than manufacturer reported values.<sup>3</sup> ENERGY STAR should strive to ensure that only equipment that will achieve real energy savings are certified through the program. We thus encourage EPA to consider requiring the CVP to be used for ENERGY STAR certification for “small” and “large” VRF systems.

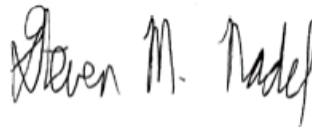
**As part of the transition to a net-zero economy, we encourage EPA to consider only allowing heat pumps to qualify for ENERGY STAR certification.** Heat pumps can provide all the benefits of air conditioners, while offering the additional function of efficient electric space heating. The broader adoption of heat pumps in place of CUACs therefore has the potential to reduce the reliance on fossil fuels for heating, as many commercial buildings with CUACs use gas- or oil-fired equipment for all of their heating. EPA could encourage these fossil fuel reductions—with the associated reductions in pollution and greenhouse gas emissions—by moving single-function air conditioners out of scope for the light commercial HVAC specification. EPA could also follow a similar pathway for other categories of heating and cooling products.

Thank you for considering these comments.

Sincerely,



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<sup>3</sup> <https://www.regulations.gov/document/EERE-2018-BT-STD-0003-0011>.