

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

June 23, 2020

Ms. Catherine Rivest  
U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
Building Technologies Office, EE-5B  
1000 Independence Avenue SW  
Washington, DC 20585

**RE: Docket Number EERE–2019–BT–STD–0033/RIN 1904-AE78: Request for Information for Energy Conservation Standards for Single Package Vertical Units**

Dear Ms. Rivest:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP) and American Council for an Energy-Efficient Economy (ACEEE) on the request for information (RFI) for energy conservation standards for single package vertical units (SPVUs). 85 Fed. Reg. 22958 (April 24, 2020). We appreciate the opportunity to provide input to the Department.

**DOE should evaluate potential amended standards for SPVUs based on an amended test procedure.**

The current efficiency metrics for SPVUs, EER and COP, reflect only full-load cooling and heating performance. Furthermore, the current test procedure fails to adequately capture fan energy use and heating performance at lower ambient temperatures. In our comments on the 2018 test procedures RFI, we urged DOE to: (1) develop a new cooling efficiency metric that better reflects annual energy consumption including part-load operation; (2) capture fan energy use when the compressor is off and revise the external static pressure values to better reflect field conditions; and (3) incorporate defrost and reflect heating performance at lower ambient temperatures in the heating efficiency metric.<sup>1</sup> These test procedure changes would result in changes to efficiency ratings that would better represent performance during a representative average use cycle and provide better information to consumers in making purchasing decisions. These changes would also encourage the adoption of features such as variable-speed compressors and innovative defrost strategies, which would ultimately provide savings for consumers. DOE should consider amended standards for SPVUs based on an amended test procedure.

**Greater energy savings are possible than those evaluated for the 2015 final rule.** The RFI notes that in the 2015 final rule, the “max-tech” levels were equivalent to the maximum-available efficiency levels.<sup>2</sup> As DOE shows in the RFI, for all three equipment classes for which there are models available on the market, the most-efficient models have either EER or COP ratings that are higher than the max-tech levels in the 2015 final rule.<sup>3</sup> We also note that for single package vertical air conditioners (SPVACs) with cooling capacities  $\geq 65,000$  Btu/h and  $< 135,000$  Btu/h, it appears that a manufacturer has introduced a model with a higher EER than the maximum-available level at the time that DOE reviewed the DOE

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<sup>1</sup> <https://www.regulations.gov/document?D=EERE-2017-BT-TP-0020-0004>.

<sup>2</sup> 85 Fed. Reg. 22964.

<sup>3</sup> 85 Fed. Reg. 22965. Table II.7.

Compliance Certification Database (CCD) for the RFI. Specifically, DOE shows in the RFI that the max-tech level in the 2015 final rule was 10.0 EER while the current maximum-available level is 11.2 EER. As of June 2020, the maximum-available level in the DOE CCD is 11.5 EER.<sup>4</sup>

Furthermore, an amended test procedure would allow DOE to consider a range of technology options that were not considered in the 2015 final rule that could achieve large additional savings. As DOE notes in the RFI, DOE did not evaluate thermostatic expansion valves (TXVs) and electronic expansion valves (EEVs), thermostatic cyclic controls, or multi-speed compressors in the analysis for the 2015 final rule because they only provide benefits at part-load conditions.<sup>5</sup> These technology options could be considered for amended standards based on a test procedure that captures part-load performance. In the RFI, DOE also identified additional technology options that were not considered in the 2015 final rule that could also improve part-load performance including variable-speed condenser fans and motors and variable-speed indoor blowers and motors.<sup>6</sup> In addition, an amended test procedure that captures defrost and reflects heating performance at lower ambient temperatures would allow for consideration of additional technologies that improve heating performance such as improved defrost strategies.

Finally, we understand that typical SPVUs use R410A as the refrigerant and that alternatives to R410A such as R32, R452B, and R454B can improve efficiency by at least 5%.<sup>7</sup> We encourage DOE to consider alternative refrigerants as a technology option to improve efficiency.

Thank you for considering these comments.

Sincerely,



Joanna Mauer  
Technical Advocacy Manager  
Appliance Standards Awareness Project



Christopher Perry, PE  
Research Manager, Buildings Program  
American Council for an Energy-Efficient  
Economy

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<sup>4</sup> [https://www.regulations.doe.gov/certification-data/#q=Product\\_Group\\_s%3A\\*](https://www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A*).

<sup>5</sup> 85 Fed. Reg. 22962.

<sup>6</sup> Ibid.

<sup>7</sup> [https://www.aceee.org/files/proceedings/2016/data/papers/3\\_406.pdf](https://www.aceee.org/files/proceedings/2016/data/papers/3_406.pdf).