

December 10, 2021

Ms. Abigail Daken
Manager, ENERGY STAR HVAC Program
United States Environmental Protection Agency
Washington, DC 20460
(Sent via email to LCHVAC@energystar.gov)

Mitsubishi Electric US Comments on ENERGY STAR® Draft 1, Version 4.0, Product Specification for Light Commercial HVAC equipment

Dear Ms. Daken,

Mitsubishi Electric US, Inc. (MEUS), a leading provider of ductless and Variable Refrigerant Flow (VRF) heat pumps and air conditioning systems, is submitting these comments in response to the US Environmental Protection Agency (EPA) ENERGY STAR® Draft 1, Version 4.0, Product Specification for Light Commercial HVAC, issued on November 1, 2021.

Certification Criteria / Energy Efficiency Requirements

- 1. Table 2, CUHPs.** For Central Unitary Heat Pumps, Table 2, EPA has proposed efficiency levels expressed in IEER that are higher for large CUHP (17.3 IEER / 17.0 IEER) than small CUHP (16.0 IEER / 15.7 IEER). Part-load efficiencies of these products should mirror federal efficiencies and decrease as capacity increases.
- 2. Tables 1 and 2, CUACs and CUHPs.** The IEER differences between “electric resistance (or none)” and “all other” heating section types are proposed to be 0.3 IEER. EPA should set the difference at 0.2 IEER to align with the values currently specified in DOE requirements.
- 3. Table 3, VRF.** MEUS is willing to work with EPA to include VRF equipment rated above 240,000 Btu/h to ensure that an incentive is in place for this equipment equivalent to smaller equipment.

Cold Climate Energy Efficiency Criteria

- 1. Criteria Harmonization.** MEUS supports the introduction of a Cold Climate designation for VRF equipment. However, the VRF industry is currently subject to different region-specific performance requirements and recommends that EPA coordinate the cold climate energy efficiency criteria with organizations such as NEEP so that participation in ENERGY STAR is not discouraged by differing requirements.
- 2. COP minimum values do not reflect cold climate performance.** The levels proposed by LCHVAC Version 4.0 will eliminate many VRF systems that are currently designated as cold climate heat pumps from qualifying for ENERGY STAR. MEUS recommends the following changes:

	LCHVAC v4.0	MEUS proposal	LCHVAC v4.0	MEUS Proposal
Capacity (kBtu/h)	COP (47°F)	COP (47°F)	COP (17°F)	COP (17°F)
≥65,000 to <135,000	3.6	3.4	2.5	2.25
≥135,000 to <240,000	3.6	3.25	2.5	2.07
≥240,000	Not included	3.20	Not included	2.05

3. Capacity Maintenance. Ratios of capacity are not a panacea for the failings of traditional efficiency metrics. The currently advocated ratio of rated heating capacity at 17°F to rated heated capacity at 47°F is arbitrary and irrational and so requiring this value for ENERGY STAR certification provides credibility to a calculation that has no merit in determining retention of capacity in a way that is meaningful to proper application on commercial properties. The only ratio that has any correspondence to equipment in the marketplace that performs better at colder temperatures is of the maximum capacity of a system at 5°F relative to rated capacity at 47°F, but even this is not important where heat pump equipment is selected based on meeting building load at local design temperature. Manufacturers provide transparency regarding performance at lower temperatures, which is more useful than the proposed ratios of capacity. MEUS recommends that EPA drop the capacity maintenance requirements entirely and focus on the correct COP values.

4. Remove EER requirements from Table 4. MEUS recommends removing EER minimums from the cold climate criteria as applicable to VRF systems. The cold climate specification should focus on heating efficiency and performance and not cooling performance, especially for VRF equipment which will rarely operate at maximum cooling capacity in the regions for which a cold climate designation is useful. EER was removed for residential equipment under proposed ENERGY STAR v6.1. Similarly, the US DOE has recently announced under a Notice of Proposed Rulemaking its intention to replace EER with IEER in the next test procedure and energy conservation standard for VRF equipment.

Test Methods, Table 7

The correct test method reference for Variable Refrigerant Flow equipment is “AHRI Standard 1230 with Addendum 1” which was published in 2017. This is the current standard against which equipment is certified by AHRI and will remain in effect until AHRI Standard 1230-2021 is effective under the next VRF rulemaking (date TBD).

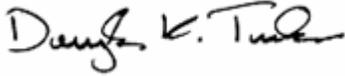
Connected Criteria

MEUS agrees with EPA that criteria for a “connected” designation is not appropriate for Light Commercial HVAC equipment. Capabilities for a system to communicate with a building automation

system are either provided by a propriety system or through an open communication protocol, of which ASHRAE's BACnet® is commonly specified.

MEUS appreciates the opportunity to provide these comments. If you have any questions regarding our comments or need additional information, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Douglas K. Tucker". The signature is written in a cursive, slightly slanted style.

Douglas K. Tucker
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