

October 26, 2016

Abigail Daken
US Environmental Protection Agency
Ariel Rios Building 6202J
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Daken:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the ENERGY STAR® Draft 2 Version 3.0 ENERGY STAR Light Commercial HVAC (LC HVAC) Specification (Draft 2 Specification), released by the Environmental Protection Agency (EPA) on September 22, 2016.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces. In 2014, CEE members directed over \$6.7 billion of the \$8.7 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so it may continue to serve as the national marketing platform for energy efficiency.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

CEE Supports Alignment of ENERGY STAR Criteria with Current Efficiency Program Requirements

In several aspects, EPA has proposed to align ENERGY STAR criteria with CEE specifications. These aspects include:

- CEE Tier 2 criteria for split and packaged air conditioners >65,000 Btu/h and <240,000 Btu/h;

- CEE Tier 2 EER, COP at 47°F, and COP at 17°F criteria for split and packaged heat pumps $\geq 65,000$ Btu/h and $< 135,000$ Btu/h;
- CEE Tier 1 EER and COP at 17°F criteria for split and packaged heat pumps $\geq 135,000$ Btu/h and $< 240,000$ Btu/h.

CEE agrees that these criteria are appropriate for the ENERGY STAR specification based on current market conditions and that alignment with CEE member program requirements reduces market confusion. CEE and its members plan to revisit the appropriateness of the CEE Commercial Unitary AC and HP Specification in 2017 ahead of the new federal minimums that take effect in 2018.

CEE Applauds the Addition of COP at 17°F as a Performance Requirement in Addition to COP at 47°F

We support the addition of COP at 17°F as a performance requirement as proposed in Draft 2. The CEE Commercial Unitary AC and HP Specification includes COP rated at 47°F and COP rated at 17°F performance criteria for equipment $\geq 65,000$ Btu/h. CEE members value efficient performance throughout the full range of operating conditions seen by air conditioning and heat pump equipment. The 17°F condition represents peak conditions in parts of many southern US states¹ and average winter lows in many northern states. Identifying efficient performance at 17°F can help reduce peak demand in southern states and ensure efficient operation and sufficient capacity on average winter days in northern states. We support EPA's proposal to include both COP at 47°F and COP at 17°F as performance requirements and harmonize the COP at 17°F requirements with those of the CEE Commercial Unitary Heat Pumps Specification.

CEE Supports the Proposed Criteria for Air Conditioners $\geq 65,000$ Btu/h and $< 240,000$ Btu/h

We agree with EPA's response to stakeholder input that the Draft 1 proposed criteria may be too stringent and that multiple regulatory changes impacting manufacturers would hinder their ability to meet the proposed levels. EPA states in the proposal that the proposed AC levels represent the top 23 to 30 percent of models in the AHRI Directory and offer paybacks ranging from four to six years. Given that EPA is proposing to decide on performance levels for 2018 in late 2016, we agree that the choice of CEE Tier 2 for split and packaged AC is supported by current market conditions. Further, alignment with CEE benefits manufacturers and CEE members by minimizing market confusion, supports manufacturers who made investments designed to yield performance specified by CEE and its members, and adds the power of the ENERGY STAR label to existing programs currently referencing the CEE specifications.

¹ASHRAE. "Climatic Design Information, Appendix: Design Conditions for Selected Locations" *ASHRAE Handbook—Fundamentals*. 2009

Consider More Stringent IEER Requirements for Heat Pumps

Unitary heat pumps and air conditioners are not substitutes for one another due to the added functionality of heating using the refrigeration cycle that heat pumps provide. The heat pump heating functionality has efficiency benefits compared to electric resistance heating and gas fired heating, which merit some compromise on cooling efficiency. Heat pumps are designed for both efficient heating and cooling but there is a design tradeoff, and the duality imposes efficiency costs, too. Federal standards and model energy codes such as ASHRAE 90.1 have historically included slightly lower cooling performance (measured in EER and IEER) ratings for unitary heat pumps than for air conditioners to account for technical constraints on heat pump cooling efficiency resulting from added hardware and design tradeoffs needed to make a unit capable of both heating and cooling.

ASHRAE 90.1-2013 and the 2018 federal minimums have set IEER levels 0.7 lower for heat pumps than for air conditioners in the $\geq 65,000$ Btu/h and $< 135,000$ Btu/h range. EPA proposes IEER criteria 1.2 lower for heat pumps than for air conditioners. CEE recommends that EPA align IEER criteria with CEE Tier 2 as it has for the other performance criteria for this size range. While aligning with CEE Tier 2 IEER criteria would result in thirteen fewer AHRI Directory product listings meeting ENERGY STAR criteria, it provides additional energy savings of 739 kWh per year while only increasing the payback period by five months, based on EPA lifecycle energy use data, cost data, and methodology. The reduction in qualifying products does not account for duplicate model numbers in the AHRI directory, so the impact on qualifying models compared to EPA Draft 2 proposed criteria would likely be even smaller. The CEE Tier 2 IEER criteria sufficiently recognizes the technical constraints on heat pump cooling efficiency compared to air conditioners without holding high efficiency heat pumps to an unnecessarily low standard consistent with analysis conducted by DOE and ASHRAE.

EPA proposed heat pump criteria for $\geq 135,000$ Btu/h and $< 240,000$ Btu/h are 1.2 lower than those proposed for air conditioners in that size range, and only 0.4 higher than the 2018 federal minimum. ASHRAE 90.1-2013 and the 2018 federal minimums IEER levels are 0.8 lower for heat pumps than for air conditioners in that size range. IEER levels for products listed in the AHRI Directory that meet the proposed EER and COP criteria all significantly exceed EPA's proposed levels and range as high as 18 IEER. Given this information, an IEER delta of 1.2 for heat pumps compared to air conditioners is excessive. CEE recommends EPA consider more stringent IEER requirements, for example setting IEER deltas closer to the 0.8 difference used in the 2018 federal minimums and ASHRAE 90.1 2013.

CEE Supports Further Differentiation of High Efficiency Variable Refrigerant Flow (VRF) Multisplit Systems

CEE continues to support EPA differentiation of high efficiency variable refrigerant flow (VRF) multisplit systems from standard efficiency VRF systems through separate ENERGY STAR specifications. Not in all applications are VRF systems substitutes for conventional unitary systems. Having a separate VRF specification allows for promotion of high efficiency VRF, or high efficiency conventional unitary equipment, depending on which is the appropriate technology for the application. Further, differences in the ratings and test procedures, indoor fan energy, and the fact VRF systems are typically not integrated with airside economizers led CEE members to conclude a separate category is appropriate at this time.

In our comments on Draft 1, CEE requested additional publicly available information on VRF equipment cost and energy savings. CEE thanks EPA for sharing its payback analysis including the underlying data, assumptions, and methodology. We support EPA's method to assess the VRF market by focusing on ducted configurations as opposed to ductless, which often have lower efficiency ratings and ultimately determine a model's performance certification.

Over 60 percent of VRF models in the $\geq 135,000$ Btu/h and $< 240,000$ Btu/h range meet the proposed levels. CEE recommends EPA consider more stringent IEERs to bring the percentage of qualifying products closer to 40 percent as is currently the case for the $\geq 65,000$ Btu/h and $< 135,000$ Btu/h range. Proposed IEER levels for the $\geq 135,000$ Btu/h and $< 240,000$ Btu/h category are 1 IEER lower than those proposed for the $\geq 65,000$ Btu/h and $< 135,000$ Btu/h category, though this drop off does not appear to be justified by the AHRI model analysis EPA provides. One reason the EER and IEER ratings tend to be lower for unitary equipment in larger size categories is that the static pressure rating condition increases as equipment capacity increases. However, based on the relevant test procedure (AHRI 1230), the static pressure rating point for VRF systems maxes out at 60,000 Btu/h and therefore higher static pressure is not a justification for lower EER and IEER requirements for VRF systems in the $\geq 135,000$ Btu/h and $< 240,000$ Btu compared to VRF systems $< 135,000$ Btu/h. Given that the AHRI model analysis doesn't indicate a drop off in product availability at the proposed IEER level for the $\geq 135,000$ Btu/h and $< 240,000$ category, and the static pressure justification does not apply to these VRF systems, CEE recommends EPA consider more stringent IEER criteria. At a minimum, CEE recommends EPA reduce the IEER delta for equipment $\geq 135,000$ Btu/h and $< 240,000$ Btu/h compared to equipment $\geq 65,000$ Btu/h and $< 135,000$ Btu/h category from 1 IEER to 0.5 IEER, or 16.9 IEER for units without heat recovery and 16.7 IEER for units with heat recovery. This would be consistent with the deltas used within ASHRAE 90.1-2013 and the current CEE Specification.

Thank you for your consideration of these comments. Please contact CEE Program Manager Bjorn Jensen at (617) 337-9280 with any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ed Wisniewski". The signature is fluid and cursive, with a prominent initial "E" and "W".

Ed Wisniewski
Executive Director