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December 13, 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 ENERGY STAR® Light Commercial (LC) HVAC Final Draft Specification proposal, released by the Environmental Protection Agency (EPA) on November 28, 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 45 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

EPA has proposed to align ENERGY STAR criteria with CEE specifications currently used by at least forty-seven efficiency programs in 2016, and we would like to reiterate our support for this proposal. Specifically, we support ENERGY STAR adopting:

- CEE Tier 2 criteria for split and packaged air conditioners >65,000 Btu/h to <240,000 Btu/h
- Tier 2 EER, COP at 47°F, and COP at 17°F criteria for split and packaged heat pumps ≥65,000 Btu/h to <135,000 Btu/h
- CEE Tier 1 EER and COP at 17°F criteria for split and packaged heat pumps ≥135,000 Btu/h to <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.

Proposed Criteria for Heat Pumps 65,000 Btu/h and Larger May Not Offer Sufficient Product Differentiation or Energy Savings to Merit Program Support

CEE comments on Draft 2 recommended that EPA align IEER criteria for split and single package heat pumps ≥65,000 Btu/h and <135,000 Btu/h with CEE Tier 2 as it has for the other performance criteria for this size range, and consider increasing IEER criteria for heat pumps in the ≥135,000 Btu/h and <240,000 Btu/h category. In the Final Draft proposal EPA has retained the IEER levels proposed in Draft 2 for both size categories. The decision to retain the Draft 2 levels was based on EPA analysis that about a quarter of models on the market meet the Draft 2 requirements, which is what the ENERGY STAR levels seek to identify, and that there would be insufficient qualifying product if EPA adopted the CEE recommended IEER levels. CEE accepts that product availability is limited at CEE recommended performance levels, but is concerned that Draft Final proposed criteria for split system and single package heat pumps 65,000 Btu/h and greater may not offer sufficient differentiation and energy savings to merit program support, particularly in the ≥135,000 Btu/h and <240,000 Btu/h category where proposed IEER criteria are just 0.4 above the 2016 federal minimum requirement. CEE understands that brand tenets requiring product availability from multiple manufacturers prevent EPA from adopting more stringent IEER for ≥135,000 Btu/h and <240,000 Btu/h category, unless additional manufacturers have indicated they will introduce eligible products before the 2018 effective date. CEE Tier 2 will continue to recognize products that provide sufficient energy savings to justify the expenditure of ratepayer funds. CEE reiterates the recommendation to align IEER criteria for heat pumps in the ≥65,000 Btu/h and <135,000 Btu/h range with CEE Tier 2 as there are products available from multiple manufacturers in every nominal ton category.

CEE Recommends that EPA Align IEER Criteria in the 65,000 Btu/h to 135,000 Btu/h Range with CEE Tier 2 as It Has for the Other Performance Criteria

CEE comments on Draft 2 explained that 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 in some cases, fossil fuel 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, for both EER and IEER, 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 ≥65,000 Btu/h to <135,000 Btu/h range.

In Draft 2, EPA proposed 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 fifteen fewer AHRI Directory product listings meeting ENERGY STAR criteria, based on EPA lifecycle energy use, cost data, and methodology, it would provide additional energy savings of 739 kWh per year, while only increasing the payback period by five months. The reduction in qualifying products did 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. CEE comments argued that 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.

Confirm that Heat Pumps in the ≥135,000 Btu/h to <240,000 Btu/h Range Provide Heating Energy Savings

In the Final Draft, EPA has proposed to reduce the COP at 47°F requirement for heat pumps in the ≥135,000 Btu/h to <240,000 Btu/h range from 3.3 as proposed in Daft 2 to 3.2. This level aligns with the current CEE specification that is currently optimized for cooling performance and is likely to be revisited in 2017, model building energy codes, and the federal minimum standard. EPA made this change because it believes that the market influence of specification alignment is more important than a slight 0.1 decrease in one of four performance metrics. CEE typically supports alignment of ENERGY STAR with the CEE specification. However, as 3.2 COP at 47°F is the federal minimum standard level for heat pumps in the ≥135,000 Btu/h to <240,000 Btu/h size range, alignment at this level potentially creates unintended implications for the ENERGY STAR brand. A consumer selecting an ENERGY STAR labeled heat pump over an unlabeled heat pump will likely expect to realize heating energy savings during the winter. Based on the proposed specification, ENERGY STAR heat pumps may not meet this expectation for consumers in climates with mild winters. The inclusion of COP at 17°F requirement may mitigate this concern for consumers in cold climates as there is no federal minimum standard for COP at 17°F, and perhaps would render our concern moot if these products also proved more efficient during moderately cold days. If this is the case, we recommend EPA provides its basis for expected heating energy savings to consumers, for example by showing the difference between ENERGY STAR COP at 17°F and the average COP at 17°F of heat pumps in the dataset, and identifying the

climate conditions under which consumers can expect to realize heating savings. Based on analysis of product listings in the AHRI Directory, the product universe for heat pumps 135,000 Btu/h and greater is relatively small compared to other unitary products and there is minimal opportunity to increase COP at 47°F requirements. If the 17°F requirement fails to yield measurable energy savings, we recommend EPA work with partners to manage consumer expectations regarding heating performance.

CEE Recommends Against Eliminating COP at 17°F as a Performance Requirement for Variable Refrigerant Flow (VRF) Multisplit Heat Pumps

EPA has proposed to eliminate COP at 17°F as a performance requirement for VRF Multisplit Heat Pumps in the Final Draft proposal. In the cover memo accompanying the Final Draft proposal EPA states:

> Manufacturers recommended eliminating the requirements for EER and COP17 for VRF units, claiming that with the relatively small number of models of VRF systems, it was difficult to find models at every capacity that meet all four requirements. They argue that IEER and COP47 are sufficient to capture seasonal energy use and savings. Given the relative novelty of these products in the market, and their great potential for energy savings, EPA has chosen to eliminate the COP17 requirement for this version. As VRF becomes more common, EPA would expect to include COP17 requirements in future specification versions.

We recommend EPA maintain the COP at 17°F performance requirements included in the Draft 2 Proposal. CEE members, who operate in diverse climates, value efficient performance throughout the full range of operating conditions seen by air-conditioning and heat pump equipment. The 17º F condition represents peak conditions in parts of many southern US states 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 acknowledge that inclusion of the COP at 17°F performance requirements as proposed in Draft 2 will prevent models at some capacities in manufacturers' product lines from qualifying, particularly when models are tested in the ducted configuration. However, a review of the AHRI Directory shows that there would be qualifying models in every major capacity from multiple manufacturers that meet all four performance criteria including the COP at 17°F performance requirement. Further, EPA estimated that over 35 percent of models in the ≥65,000 Btu/h to <135,000 Btu/h range and over 60 percent of VRF models in the ≥135,000 Btu/h to <240,000 Btu/h range meet the levels proposed in Draft 2 including the COP at 17°F requirements. We recommend against eliminating COP at 17°F from the proposed performance requirements and that EPA includes the Draft 2 proposed COP at 17°F levels in the final specification.

CEE would once again like to thank the EPA for the opportunity to comment on ENERGY STAR LC HVAC Final Draft Specification proposal. Please contact CEE Program Manager Bjorn Jensen at 617-338-9280 with any questions about these comments.

Sincerely,

Ed Wisniewski
Executive Director