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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF AIR AND
RADIATION

August 3, 2018

Dear ENERGY STAR® Residential Air Source Heat Pump and Central Air Conditioner Equipment Brand Owner or Other Interested Party:

The U.S. Environmental Protection Agency (EPA) is launching the ENERGY STAR Version 6.0 Residential Air Source Heat Pump (ASHP) and Central Air Conditioner (CAC) Equipment specification development process. All materials related to this revision process will be located on the [ENERGY STAR CAC/ASHP Version 6.0 Product Development webpage](#).

EPA reviews all ENERGY STAR specifications regularly, and sees an opportunity with this revision to help provide consumers more cost effective units that will deliver performance while reducing heating and cooling costs and energy use. This letter informs stakeholders of key topics that EPA plans to explore in the forthcoming specification development process, and questions it seeks answers to. Stakeholder engagement is a vital aspect to the success of the ENERGY STAR program, and EPA looks forward to working with all parties to develop the ENERGY STAR Version 6.0 specification. Please submit any formal comments on this letter to cacashp@energystar.gov by **September 7, 2018**.

Variable Capacity

EPA considers the biggest current and upcoming opportunity in CAC/ASHP efficiency and performance to be systems that have more than one capacity. Staged systems with two or three capacities correct for oversizing, with significant improvements in customer comfort, equipment longevity, and energy use. Modulating systems specifically provide additional customer comfort advantages by following load, provide further energy efficiency improvements, and provide unique advantages for demand response.

EPA will be examining the current CAC/ASHP specification in light of the benefits of encouraging the market trend toward staged and variable capacity models. One potential way to encourage two stage and variable speed equipment would be to raise seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF) levels such that only those technologies can meet them. However, it is not clear to EPA that this is the best way to make staged and variable capacity equipment available to a wider range of consumers. An alternate possibility is to simply require that models have two or more capacity stages.

As EPA considers these possible requirements, there are several other interrelated issues. For instance, EPA is aware that energy efficiency ratio (EER) requirements in the specification present a barrier to wider adoption of staged and variable capacity equipment. Several manufacturers have indicated that the additional cost of variable capacity units could be lower if EER requirements were lower. Two strategies, discussed in the following two sections, may allow for reduced EER requirements.

Regionally- Specific Performance Requirements

One of the motivations for the EER requirements in the current ENERGY STAR specification is to assure efficient seasonal performance in hot dry climates. This mirrors the inclusion of EER in the Federal minimum efficiency standards in the Southwest region.

EPA's ENERGY STAR specification is not currently regionally specific, requiring the same minimum performance for all models to be certified, no matter the installation location. A regional specification might allow easing of EER requirements outside the Southwest, focusing this requirement on the region where it delivers best value. It would also allow EPA to start addressing the market interest in heat pumps specifically intended for cold climates, enabling reporting of cold climate performance in the U.S. North. Note that if EPA adopted a regional specification, it would use the regions that are currently in the DOE minimum efficiency standards for central AC and air source heat pumps. As with furnaces, the requirement would be for manufacturers to ensure equipment bears the appropriate regional label, rather than needing to understand where it is installed.

Feedback Request:

1. Is EER used to predict seasonal efficiency anywhere outside the U.S. Southwest region?
2. How widespread is the need to control peak load by incentivizing high EER systems?
3. Are there other opportunities a regional specification would present?
4. EPA is aware of ongoing efforts to define northern climate heat pump performance and establish a test method, for instance the Northwest Energy Efficiency Alliance (NEEA) effort and work that the Canadian Standards Association (CSA) is doing with a Canadian utility. What are the relative advantages and disadvantages of those efforts, for instance repeatability, testing burden, and capturing real world effects? Should other methods of establishing this performance be considered?

Optional Connected/ Grid-aware Criteria

The EER requirements in the current ENERGY STAR specification are also important to limit peak demand in areas where utilities face capacity constraints. However, variable capacity units have the helpful property that limiting capacity by a certain percentage reduces power draw by a larger percentage – so utility customers can keep most of their cooling capacity and still ease up their demand significantly. Units that can respond to requests to limit their load could in theory address peak demand problems without a very high EER.

The ENERGY STAR program has numerous product categories, such as Room Air Conditioners, Lighting, and Pool Pumps, which include optional connected criteria. For most of the specifications, products can be certified as ENERGY STAR without meeting these criteria, but those products that do are listed as "connected" on the ENERGY STAR certified products lists. Generally, the criteria include the use of open standards for communication, provision of energy consumption reporting, operational status updates, as well as remote management and load management capabilities, as applicable.

EPA is interested in exploring the inclusion of optional connected criteria in the Residential Air Source Heat Pump and Central Air Conditioners specification. EPA intends to build on the work of the Consortium for Energy Efficiency (CEE) and the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) on the AHRI 1380 standard for grid responsive equipment and the field trials of grid responsive equipment that the Electric Power Research Institute (EPRI) has run.

Feedback Request:

5. Would it be reasonable for products with DR capability to have lower EER requirement (aside from where needed for seasonal energy) than those without?
6. Are there any problems with relying on AHRI 1380 for demand responsiveness criteria?
7. What value does connectivity bring to CAC/ASHP customers (aside from grid value)?
8. How would one consider connectivity for products intended to work with a proprietary controller that is not part of the unit itself, but instead takes the place of a thermostat?

Energy Efficiency Metrics

EPA plans to use SEER, EER, and HSPF for Version 6, instead of the new metrics (SEER2, EER2, and HSPF2) that DOE requires for representations after January 1, 2023. However, EPA sees value in establishing parallel requirements using the new metrics if enough data exist. Doing so would provide a path for partners to certify using new metrics, thus easing the transition to a later version solely in terms of the new metrics.

Feedback Request:

- 9. Would it be possible to establish parallel SEER2, EER2, and HSPF2 criteria?
- 10. If so, would any manufacturers be interested in using this option?

Closing Remarks

Thank you for taking the time to review this letter and the topics that EPA plans to explore in the forthcoming revision. EPA is not planning a webinar to cover this information, but welcomes stakeholder input to inform the first draft, either through formal comments or informal conversation. If you would like to discuss any of the topics outlined in this document in more detail, please contact Abigail Daken, Daken.Abigail@epa.gov or (202) 343-9375, and Jacob Bayus, Jacob.Bayus@icf.com or (202) 791-8871.

Please submit any formal comments to cacashp@energystar.gov by **September 7, 2018**. EPA may also reach out to stakeholders for further discussion on these topics. All comments will be posted to the [ENERGY STAR Product Development webpage](#) unless the submitter requests otherwise. To track EPA's progress on this specification, please visit the product development webpage via www.energystar.gov/revisedspecs. EPA looks forward to working with stakeholders during this specification revision process.

Separate from this specification revision process, EPA is hosting its annual [ENERGY STAR Products Partner Meeting](#), which takes place in Phoenix, AZ from September 5 to 7, 2018. EPA will be leading informative and interactive sessions on efficiency in residential HVAC products, connected criteria for ENERGY STAR CAC/ASHP, and midstream incentive programs. Interested stakeholders can register for this event [here](#) by August 14, 2018.

Thank you for your continued support of the ENERGY STAR program.

Sincerely,



Abigail Daken, Manager
ENERGY STAR HVAC Program

For more information, visit: www.energystar.gov

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