

July 24, 2019

Ms. 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 Draft 1 Version 6.0 Air Source Heat Pump (ASHP) and Central Air Conditioner (CAC) Equipment, released by the Environmental Protection Agency (EPA) on April 23, 2019.

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 38 US states, the District of Columbia, and four Canadian provinces. In 2017, CEE members directed over 70 percent of the \$9 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.

# An Evolving Market Requires Strategies that Differentiate High Performing Equipment for Diverse Applications

## Until a Basis Justifying the Need to Prescribe Particular Technologies is Explained, CEE Recommends Continuing with a Performance Specification

Variable capacity systems have the potential to deliver enhanced energy efficiency and load management opportunities as well as comfort and consumer satisfaction benefits. EPA's intention to further differentiate variable capacity models is in concert with many members' goals, and the ENERGY STAR label may serve as an effective mechanism for recognizing such products. While staged or variable capacity functions can provide significant advantages in many residential applications, and CEE supports voluntary approaches that enable such savings to be recognized, our membership advocates for a specification approach that is neutral of stipulated technologies or prescribed applications for meeting these performance objectives. The proposed certification criteria of 3C *Staged or Variable Capacity Requirement* may inadvertently prohibit future technologies or systems that demonstrate high performance but are not defined as units that "must be capable of operating at two or more distinct capacities or must have a capacity which is continuously variable". If EPA believes there is ultimate value to every customer through inclusion of this provision, please provide additional background data and justification for why a prescriptive requisite is a universally appropriate solution. Further analysis that demonstrates whether increased seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF) levels would achieve the desired outcome would also be helpful.

## Regional Variation May Require Unique Program Approaches and Savings Strategies

In terms of regional differentiation, CEE recognizes that for some products it makes sense to provide further delineation of requirements based on climate, such as EPA has done for windows, doors, and skylights. Through its tiered specifications, CEE affords members flexibility in selecting the appropriate performance levels for their jurisdiction while maintaining a degree of consistency across the United States and Canada. Although ENERGY STAR is most powerful as a nationally consistent label that delivers a simple

binary message, we note that residential heating and cooling systems are often marketed differently from traditional retail products, and that the involvement of a trained salesperson may allow for a more nuanced use of ENERGY STAR. With this in mind, consumer confusion could be less of a factor should EPA develop regional specifications. We concur that there are potential benefits of addressing unique climate applications through regionally specific performance requirements, particularly with the existence of regional federal minimum standards.

Should EPA decide to move forward with further distinctions by region, CEE recommends keeping the distinctions as simple as possible, while still achieving the intended outcome of serving unique climate considerations. Typically, alignment with DOE's regulatory paradigm and associated reporting requirements is desirable for industry and amenable to CEE's members. If the HVAC industry and DOE concur that ENERGY STAR should deviate from the minimum regional standards established by DOE, CEE would be open to such an approach. EPA's current proposal provides a preferred option because the purchasing decision can ultimately be based on which product is most appropriate for the given application. Instead of prescribing models to a climate-based specification, it enables end users (either program administrators, contractors, homeowners, or other decision-makers) to assess if and how to best utilize the suggested Moderate and Hot Climate and Cold Climate types. To date, CEE members across various regions have found all three existing metrics (SEER, HSPF, and EER) to be useful for program promotion and achieving distinct savings objectives; for example, many utilities leverage EER levels to address summer peak demand.

To bolster a climate-differentiated specification, CEE requests two additional deliverables from EPA:

1. Further background regarding the savings opportunities associated with the unique climate considerations in order for members to better assess the suitability of pursuing this path.
2. Resources and materials to support users in understanding how to use and adopt this differentiation approach locally, including additional guidance or implementation that explains applications or selection processes.

## Additional Data and Analysis is Necessary to Justify Proposed Specification Structure

As noted by EPA in the Discussion Guide, systems that offer more than one capacity have “significant improvements in customer comfort, equipment longevity, and energy use”.

Revision of the CAC/ASHP specification to promote these modulating systems – regardless of the methodology ultimately used – will increase the performance threshold of qualifying products above the current ceiling. Should all single stage models that currently comply with the present Version 5.0 specification no longer be eligible for certification, it could have significant implications for both the percent of available units that qualify as well as the cost-effectiveness for consumers.

CEE identifies three pieces of data that would help inform if and how a prescriptive specification that stipulates qualifying products to have two or more capacity stages would impact member considerations:

1. The availability of current models that would meet such requirements, and anticipated market penetration of these models, relative to the entire suite of HVAC models in the market. If this number is significantly different from the 25% market share that ENERGY STAR specifications typically try to achieve, it would be helpful to understand the implications of such deviation.
2. The incremental energy savings from modulating systems above a baseline system will be useful in assessing the program opportunity to claim savings and to ensure customers realize meaningful savings.
3. The incremental price to consumers will be needed to deem whether such a specification is sufficiently cost-effective. We support the exploration and investigation into ways that the CAC/ASHP Version 6.0 specification can be used to differentiate highest performing equipment, and appreciate the diligent methodologies that EPA undertakes through the revision process to ensure that the ENERGY STAR guiding principles are the core of these decisions.
4. Average cost-effectiveness of a single speed system meeting the proposed SEER, EER, and HSPF requirements in each DOE climate zone compared to average cost-effectiveness of a variable capacity system meeting the same criteria.

# Existing Connected Efforts that Have Support of IDSM Programs in the United States and Canada are Important Considerations for ENERGY STAR Connected Criteria

EPA's intention to build on the work of CEE, AHRI and EPRI, will help create a unified approach for all stakeholders to achieving shared objectives of load management capabilities, remote diagnostics and monitoring, consumer engagement, and energy consumption reporting. Our industry has invested a significant amount of time and coordination over the past several years, in conjunction with key industry players, to develop platforms and principles that are designed to meet the evolving utility objectives and provide customer benefit. We support EPA's stated plans to rely upon and align with established efforts that are designed to address these objectives and offer the following considerations.

## For Purposes of Defining Connectivity and Enabled Demand Response, the ENERGY STAR Program Would be Well Served by Adopting the AHRI Standard 1380

CEE was heavily involved, and financially underwrote, the development of the [AHRI Standard 1380 \(I-P\): Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications](#), and believe it has the ability to effectively address grid responsive equipment. CEE recommends that EPA reference this standard, which includes common definitions, test requirements, operating and physical requirements, minimum data requirements for published ratings, marking and nameplate data and conformance conditions. Drawing upon this resource will help ensure greater consistency of definitions and promotion of shared objectives in the market.

At a minimum, the ENERGY STAR specification should adopt the requirements as directly outlined in the standard, which identify the capabilities to support demand response strategies for predictably supporting electric grid needs and facilitating end users to participate in demand response or price response programs. **To further enable the greatest potential future opportunities, CEE suggests additional requirements at both the operating and physical levels to specify adoption of both CTA-2045-A and OpenADR.**

Section 6.1 *Summary of Operating and Physical Requirements* in the AHRI Standard 1380 requires that, for the operating and physical requirements, the “DR-ready HVAC System shall meet the communication and equipment performance requirements as itemized below for either CTA-2045-A or OpenADR 2.0 or both communication protocols”. By extending the parameters of this requirement to state that both communication protocols must be met, ENERGY STAR will position connected variable capacity HVAC systems to meet a greater array of prospective needs and objectives from CEE members interested in leveraging the ENERGY STAR platform.

Similarly, Section 6.2 *Summary of Physical Requirements* in the AHRI Standard 1380 requires that “DR-ready HVAC system shall be capable of connecting to either CTA-2045-A or OpenADR 2.0 or both communication interfaces”. Voluntary programs will have broader potential for applying the broadest range of benefits if the ENERGY STAR specification requires the adoption of both interfaces.

## Data Reporting Requirements for Residential Heating and Cooling Systems Could Enable a Broad Range of New Energy Management Opportunities

Across the suite of heating and cooling products currently encompassed by the ENERGY STAR program – including, but not limited to, furnaces, boilers, ASHP, and CAC product specifications – CEE members are interested in pursuing ways to achieve energy saving objectives through enhanced control and energy management strategies. Additional benefits that may result from data reporting capabilities present potentially significant opportunity, through value streams such as enhanced measurement and verification, verified installation metrics, increased customer satisfaction through feedback on product performance as well as customized recommendations, and improved capability for maintenance or diagnostics for either the homeowner directly or a consumer-authorized party. CEE fully encourages EPA’s exploration to include data reporting or consumer feedback functionalities that might support these value streams and offers to coordinate with EPA in better understanding the program benefits and energy impacts that they could deliver.

## CEE Principles of Connectivity Establish Core Considerations for Product Specifications

Residential HVAC has the potential to offer significant distribution system benefits from a load management perspective, and there is value to incorporating connected criteria within the ENERGY STAR Residential Air Source Heat Pump and Central Air Conditioners specification. Beyond the applications of AHRI 1380 Standard, we are interested in coordinating with EPA to identify opportunities across a broad spectrum of integrated demand side management (IDSM) value streams to offer customer benefit provided through connected capabilities. CEE has worked for many years to establish minimum requirements that will deliver responsive load management opportunities, facilitate enhanced program evaluation, support consumer engagement, and enable integrated DSM offerings. These [principles of connectivity](#) include:

- Establish multiple pathways to connect
- Use of open, nonproprietary, communication standards
- Maintain a direct line of sight
- Establish the minimum necessary communication pathways
- Secure customer data and adequately protect privacy
- Accommodate both price signals and reliability signals
- Disclose ability to accept and respond to a grid signal

## Timing and Future Revisions

Many CEE members are committed to enhanced testing methods and rating metrics that more accurately represent in-field performance of equipment. The current and upcoming 2023 DOE test procedures may not adequately capture performance in low and high ambient conditions, particularly for variable capacity systems, which makes it challenging to accurately identify products that deliver energy savings.

With the draft ENERGY STAR proposal specifying that “all units must be capable of operating at two or more distinct capacities or must have a capacity which is continuously variable”, the ability to effectively differentiate efficient models depends on having metrics that reflect real-world in-field performance. The current test procedure for federal standards compliance ([10 CFR 430.23\(m\)](#)) references AHRI 210/240, which was designed for single-speed equipment and requires that variable capacity heat pumps override their control capabilities in the test mode, which might not correctly indicate how the units will operate in real-world applications.



There are presently many studies underway to better understand opportunities to enhance the DOE test procedure<sup>1</sup>, as well as efforts to develop alternative metrics that utilize load-based methodologies instead of laboratory-based testing. While CEE's HVAC Committee is still assessing these opportunities, we are interested in working with EPA and other national entities with a shared objective to pursue future options that better reflect actual energy savings. To this extent, we encourage EPA to collaborate with DOE to actively prioritize development of reliable real-world test methods, and plan to revise the CAC/ASHP to incorporate alternative metrics when available.

CEE would once again like to thank the EPA for the opportunity to comment on ENERGY STAR Draft 1 Version 6.0 Air Source Heat Pump (ASHP) and Central Air Conditioner (CAC) Equipment. Please contact CEE Senior Program Manager Alice Rosenberg at 617-337-9287 or [arosenberg@cee1.org](mailto:arosenberg@cee1.org) with any questions about these comments.

Sincerely,

A handwritten signature in blue ink that reads "Ed Wisniewski". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Ed Wisniewski  
Executive Director

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<sup>1</sup> Central Valley Research Homes Project by PG&E, On-Site Performance of Air Source Heat Pumps by Hydro-Québec, Heating and cooling tests using load-based CSA EXP-07 by NRCan and NEEA (unpublished).