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Abigail Daken, Manager Feb 28, 2020
ENERGY STAR HVAC Program
US Environmental Protection Agency Office of Air and Radiation
1200 Pennsylvania Avenue NW
Washington, DC 20460
EPA Energy Star Product Specification for Central Air Conditioner and Heat Pump Equipment
Eligibility Criteria Draft 2, Version 6.0

Bruce Harley Energy Consulting, LLC (BHEC) welcomes the opportunity to provide feedback to EPA on this important specification. In addition to fully supporting the comments provided by the Northeast Energy Efficiency Partnerships (NEEP), BHEC provides the following comments and suggestions. Thanks for the opportunity to participate.

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Substantive comments

Lines 120-144 Climate criteria: BHEC supports the idea of climate differentiation; it is a significant improvement over previous versions. A minimum specification that attempts to balance heating and cooling efficiency for regions that include such vastly differing annual heating and cooling requirements. We support the "Cold Climate" and "Moderate and Hot Climate" designations, and strongly believe that for products that meet both, it is important to include an "All Climates" designation. Omitting an "All Climates" label will not clearly communication *inclusion* to consumers, in the absence of any other qualifier. Alternately, those products could include both the Cold and the Moderate and Hot designations; but omitting the climate modifiers entirely suggests *not* meeting any climate-specific criteria rather than meeting *both* criteria.

Lines 153 and 223 (cold climate HSPF requirements): BHEC encourages EPA to consider differentiating the HSPF requirements for cold climate, and possibly for all climates, separately for ducted and ductless indoor equipment. *Please refer to the comments provided by NEEP* for supporting rationale.

Lines 160-165 (and Line 55), Lines 230-235, Line 479 (Table, last row): Percentage of heating capacity at 5°F (70% requirement), and CVP test: EPA should consider adding to, or replacing, the 70% capacity requirement with a requirement that is based instead on the ratio of the maximum capacity at 5°F to the *minimum* capacity at 47°F. To be useful, an additional CVP test to address performance at low loads and mild temperatures (47°F) would be essential. These two proposals are closely linked; although either one could provide some value if implemented alone, the leveraged value of both together would be dramatically increased.

Rationale: *Please refer to the comments provided by NEEP* for the Percent of Heating Capacity and Part-load CVP test for the supporting rationale.

Please note also that the early certification metrics shown on lines 230-232 should be modified as follows (if they are kept): "Percent of Heating Capacity at 5° F ≥ 70%, with the heating capacity at 5° F based on manufacturer provided application data at maximum capacity, and the rated heating capacity at 47° F as reported in accordance with Appendix M." If a turn-down ratio is implemented, it should refer to the "heating capacity at 47° F based on manufacturer provided application data at minimum capacity"

Line 257-260, Installation capabilities: In general, BHEC supports the inclusion of installation support capabilities to the Energy Star specification. However, to require three of the listed six capabilities places equal weight on all six, but the importance to verify proper installation is not equal. EPA should consider changing the requirement as follows: "
Installation Capabilities: To certify as ENERGY STAR, CAC/HPs must be capable of providing aminimum subset of the following capabilities to aid in quality installation. Specifically, certified units must at a minimum meet **either** two of criteria a, b, or c, **or** criteria d. In addition, certified units must meet at least one of criteria e or f. " In addition, in item f replace the term "should" in line 277 with the term "shall" otherwise item f is virtually meaningless.

Rationale: as written, if a manufacturer chose items a, e and f to comply with the spec, air flow could not be verified as stated in lines 289-292 of the commentary. Only "fan blower" operation from item f, which does not necessarily include any of the three (flow, ESP or fan power) quantities, but may only verify that the blower works in "fan-only" mode without contributing at all to verifying adequate air flow.

Editorial suggestions/corrections
("…/ underline" shown for items in quotes, otherwise comments) as follows:

Line 51: "…COP means the ratio of the average rate of space heating or cooling delivered …"

Lines 61/62: provide a definition in the appropriate section for "unitary" or delete the terms. Lots of people in HVAC industry misunderstand the term "unitary" and use it in various ways; residential unitary equipment includes split and packaged systems and mix-match coils (essentially any systems <65,000 btu/h capacity that have AHRI ratings). See http://www.ahrinet.org/Certification/AHRI-Certification-Programs/Unitary-Air-Conditioner-Equipment

Line 71: recommend adding a definition of "cloud," or replacing the term here with a more specific citation such as "using an internet-based server" rather than "in the cloud".
Line 80 Footnote 4: "This definition does not cover all aspects of how demand response and other load management tools are being used by utilities. For instance, it does not cover behavioral DR, dispatch to prevent spilling wind resources, or any demand response implemented by .r natural gas utilities. EPA intends to address any and all of these use cases in our criteria in addition to the more traditional electric utility DR in the FERC definition."
Line 90: the term "load management entity" is not used anywhere in this document and thus could be removed. If it is needed, does it apply to an end-to-end "system" for the purpose of load management (as implied by the term)? The phrase "and the like" is rather imprecise.
Line 91-92: "…for all communication layers, standards that are: "
Line 102-103: "Consumer Override (of DR events): An active choice to opt out of a scheduled and/or active DR event that a product would…"

Line 298: (typo): "…This is the intent of d."

Line 423 (table, last row), the acronym SGD is not define anywhere in the draft document.

Line 429 (table, first row) “Maximum Indoor Temp. Rise” is not correct. In the appendix this is stated as "max indoor temperature *offset”* which would apply equally to heating or cooling (with the opposite sign); as shown here, it seems to only apply to cooling (“rise”). This should be reconciled by changing “rise” to “offset” or by requiring separate terms for cooling mode indoor temperature rise and heating mode indoor temperature drop.