



SUBMITTED VIA EMAIL: CAC-ASHP@energystar.gov

February 28, 2020

Ms. Abigail Daken
ENERGY STAR® HVAC Program
U.S. Environmental Protection Agency

Re: Comments on Draft 2 Version 6.0 ENERGY STAR® Specification on Central Air Conditioner and Heat Pump Equipment

Dear Ms. Daken:

Goodman Global, Inc. (“Goodman”) submits the following comments in response to the U.S. Environmental Protection Agency’s (“EPA”) discussion guide on Draft 2 Version 6.0 of the ENERGY STAR specification on residential and central air conditioners (“CAC”) and heat pumps (“HP”), which was issued on January 23, 2020.

Goodman is a member of Daikin Group, one of the largest heating, ventilation and air conditioning manufacturers in the world. Goodman is headquartered in Houston, Texas, and employs thousands of workers across the United States. The company manufactures residential and light commercial heating and cooling equipment, and its products are sold and installed by contractors in every American state, as well as in Canada.

I. Overview

Goodman applauds EPA’s decision to move the proposed effective date of Version 6.0 of the CAC/HP specification to January 1, 2023, based on the industry comments submitted during the Draft 1 comment period. We are hopeful that EPA will continue to place emphasis on the HVAC industry’s comments while considering changes to the ENERGY STAR requirements for CAC/HP equipment.

Although Goodman has supported the ENERGY STAR program over many years and manufactures several products that are currently ENERGY STAR certified, Goodman still has significant concerns on the revised proposals within Draft 2 Version 6.0 of the CAC/HP specification, detailed in the following sections.

We recommend that EPA consider our concerns raised in the following sections around equipment labeling, controls verification procedure (“CVP”), proposed efficiency levels, and simple payback analysis. We propose the minimum efficiency levels below on or after January 1, 2023, in lieu of EPA’s proposed climate-differentiated levels. For split-system ACs and HPs, these proposed levels are fully aligned with the Consortium for Energy Efficiency’s (“CEE”) current Tier 2 levels, which in our opinion

provide a natural increase in stringency of the split-system AC and HP ENERGY STAR levels in Version 6.0 while simultaneously maintaining an appropriate balance with existing utility program incentives designed around the CEE Tier 2 levels. In the case of single package ACs and HPs, for the reasons outlined in Section II.2. of this letter, we recommend that EPA not unnecessarily add any stringency to the levels for these products. In addition, we also propose an elimination of full load requirements for all products meeting EPA's proposed connected criteria.

- Split-system ACs: 15.2 SEER2 and 12.0 EER2*
 - Split-system HPs: 15.2 SEER2, 12.0 EER2* and 7.8 HSPF2
 - Single package ACs: 14.3 SEER2 and 11.0 EER2*
 - Single package HPs: 14.3 SEER2, 11.0 EER2* and 7.0 HSPF2
- * EER2 should not be required for any system meeting the proposed connected criteria.

II. Responses to Specific Proposals Raised in Draft 2 Version 6.0 of the CAC/HP Specification

1. Climate-Differentiated Recognition for HPs: As previously stated during the Draft 1 stage, Goodman requests that EPA not consider regional ENERGY STAR specifications as such specifications create excessive numbers of energy efficiency targets. Complying with multiple levels of regional ENERGY STAR specification and federal regional standards is onerous for manufacturers. Varying ENERGY STAR and federal regional efficiency levels would also lead to consumer confusion. The implementation of the proposed regional marks would add more burden on ENERGY STAR participants who are continuously working towards complying with EPA's current requirements. The current federal energy conservation standards set by the U.S. Department of Energy ("DOE") specify only national requirements for HPs, thus EPA's current proposals create regional requirements for such products that do not exist today. Goodman does not support EPA's proposed deviation from the national standards approach for HPs and has the following recommendations:
 - a. EPA should not mandate a wide variety of labeling schemes: The proposed provisions are ineffective as they will not provide useful information to the consumer, will impose an unnecessary burden on manufacturers and will consume significant amounts of time and resources at all stakeholder levels to finalize. Such suggested provisions will stress limited resources in the time between publication of EPA's final specification and the proposed effective date of January 1, 2023. EPA's proposal to transition to multiple labels¹ for HPs would be impossible for a manufacturer to implement for split system HPs matched with multiple indoor units. Such HPs could conceivably have all three proposed labels applicable to the outdoor unit, based upon given ratings with various indoor units.
 - b. EPA should eliminate the proposal to perform a CVP: The HVAC industry is already in the process of transitioning to new metrics while also preparing for changes to regulatory policies on refrigerants.² Goodman does not support the inclusion of the CVP proposal in

¹ "all climates," "moderate and hot climate" and "cold climate."

² California Air Resources Board draft regulatory text proposing to ban refrigerants with a GWP of 750 or greater on January 1, 2023: <https://ww2.arb.ca.gov/sites/default/files/2020-01/2020-01-28%20CA%20SNAP%20Amendments%20-%20Reg%20Text-TP-KT.pdf>.

the ENERGY STAR specification development cycle as it will add last minute changes to plans around performance, safety and reliability testing in preparation for January 1, 2023. Goodman strongly recommends that EPA continue to rely solely on the current federal test procedures established by DOE. A cold-climate performance metric at the optional 5 °F condition in Appendix M1 to Subpart B of 10 C.F.R. Part 430 is indeed an option for EPA to consider.^{3,4}

2. Proposed Efficiency Levels for Single Package Equipment: Goodman believes that the proposed efficiency levels for single package systems in Draft 2 Version 6.0 CAC/HP will significantly shrink the availability of qualifying models in January 1, 2023, thereby limiting consumer choice. As of February 20, 2020, the AHRI directory of certified product performance indicates that EPA's proposed performance criteria are significantly more stringent than the criteria typically used by EPA in the decision-making process⁵ to revise ENERGY STAR specifications. Only 7.6% of single package AC ratings and 1.4% of single package HP ratings ("moderate and hot climate" and "cold climate") of AHRI certified models today meet EPA's proposed criteria.⁶
3. Issues Related to the Simple Payback Analysis: EPA's "Draft 2 Version 6.0 ENERGY STAR CAC-HP Data Package" spreadsheet provides a range of estimated simple payback years for each product within the "Consumer Payback" tab. A majority of the estimated simple payback years are significantly longer than the estimated home ownership of homeowners for a given house. Historically, occupancy in the same home ranges from six to seven years per the 2019 Profile of Home Buyers and Sellers issued by the National Association of Realtors®.⁷ Such homeowners would never realize the full benefit of purchasing systems meeting the proposed ENERGY STAR levels.

In addition, the 2015 DOE Technical Support Document certainly did not account for the additional proposed requirements below, thus the current "Average Installed Costs" in column H are very likely lower relative to the actual average installed costs once all proposed performance criteria are considered:

- a. COP at 5 °F \geq 1.75
- b. Percent of Heating Capacity at 5° F \geq 70%
- c. CVP (new proposal in Draft 2)
- d. Installation capabilities (new proposal in Draft 2)

As an example, the estimated simple payback period for split system ENERGY STAR Cold Climate HPs would really be more than the stated 16.2 years once the additional costs above are

³ Optional 5 °F test conditions are specified in Table 14 of 82 FR 1560.

⁴ Pertinent calculations are specified in Section 4.2 of 82 FR 1575.

⁵ According to the following page on EPA's website, generally, a market share of ENERGY STAR certified products in a particular category of 50 percent or higher will prompt consideration for a specification revision along with some other factors: <https://www.energystar.gov/products/how-product-earns-energy-star-label>.

⁶ Relative to the overall number of AHRI certified models meeting the efficiency levels in the current ENERGY STAR specification.

⁷ 2019 Profile of Home Buyers and Sellers Highlights: <https://www.nar.realtor/sites/default/files/documents/2019-profile-of-home-buyers-and-sellers-highlights-11-21-2019.pdf>.

considered. Some of the performance criteria being proposed by EPA in Draft 2 were not quantified in the EPA data package since they are new proposals and stakeholder input needs to be gathered in order to develop an accurate cost model. EPA's data package estimates an average equipment lifetime of 16.4 years for HPs, so an estimated simple payback of 16.2 years is already not practical. Once the above additional proposed criteria are factored into the average installed cost, the estimated simple payback would exceed EPA's estimated equipment lifetime.

The simple payback analysis is also not in line with EPA's past recommendations on other products. In the case of residential furnaces, EPA's website states the following: "The only way to ensure that your new air conditioner performs at its rated efficiency is to replace your heating system at the same time. It's especially recommended if your furnace is over 15 years old."⁸ DOE estimates the average furnace lifetime to be 21.5 years.⁹ Keeping these aspects in mind, EPA's recommendation to replace a product is in some cases several years before the estimated end of life of that product, and for a consumer to receive a worthwhile payback on the purchase of an ENERGY STAR certified product, the simple payback should be realized by the consumer well in advance of the recommended replacement timeframe.

4. Connected Product Criteria: Goodman supports EPA's consideration of an optional connected product criteria, especially as an alternative to full load EER requirements. Goodman believes peak load can be better managed via incentivizing demand response enabled systems. To that end, we believe systems performing in accordance with the requirements specified in AHRI Standard 1380 should be considered to address the issue of peak load. We strongly support removal of EER requirements for demand response enabled products, as such products have the ability to substantially curtail their energy consumption during peak loads **and** have lower overall energy consumption. We believe AHRI Standard 1380 provides the necessary flexibility for connectivity of CAC/HP products with proprietary controllers. As long as at least one of the communication protocols specified in AHRI Standard 1380 is followed, the variety of mechanisms through which the HVAC system is controlled should not be an issue.
 - a. Additional Comments on Proposed EER and EER2 Performance Levels: Goodman strongly believes that for AC and HP systems meeting EPA's proposed connected criteria, any EER2 or EER requirements should be removed altogether for such products as they are capable of effectively managing peak load. Full load metrics are also impractical for regions that do not have the need for such metrics. For example, Version 3.0 of the cold climate Air Source Heat Pump specification published by the Northeast Energy Efficiency Partnerships ("NEEP") does not specify any EER requirements.
 - b. Additional Comments on Connected Criteria Proposals in Section 4:
 - i. Subsection 4)B.b. on Energy Reporting – The proposed language in this subsection is different from section C4.6 in AHRI Standard 1380. While section C4.6 specifies that power measurements must be instantaneous measurements, it also specifies that for variable-speed systems, twenty measurements each one

⁸ https://www.energystar.gov/products/heating_cooling/air_conditioning_central

⁹ 81 FR 65786 Supplemental Notice of Proposed Rulemaking on Energy Conservation Standards for Residential Furnaces.

- minute apart must be taken and results must be averaged. For two-stage systems, a single power measurement must be taken. Goodman recommends EPA to harmonize the energy reporting requirements with AHRI Standard 1380.
- ii. Subsection 4)C.b. on Consumer Override – As proposed, the provision stating “duration of 72 hours” on line 402 of Draft 2 Version 6.0 should be revised to “duration up to 72 hours” so that it is clear that the provision refers to a continuous duration versus a series of smaller, intermittent durations totaling 72 hours. For example, the revised language will help clarify that if a consumer chooses to invoke an override for a short duration of 2 hours, the consumer does not actually have to partake in the override for a larger duration of 72 hours.

III. Concluding Remarks

Goodman appreciates the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact myself or Rusty Tharp, Senior Director of Regulatory Affairs at either 713/263-5906 or rusty.tharp@goodmanmfg.com.

Sincerely,

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