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AHRI Request for Extension â€“ Title 24-2022 Notice of Availability - Pre-Rulemaking Express Terms, 19-BSTD-03

Additional submitted attachment is included below.

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March 9, 2021

California Energy Commission
Docket Unit, MS-4
Re: Docket No. 19-BSTD-03
1516 Ninth Street
Sacramento, California 95814-5512

(submitted electronically to Docket 19-BSTD-03)

Re: AHRI Request for Extension – Title 24-2022 Notice of Availability - Pre-Rulemaking Express Terms *[Docket No. 19-BSTD-03]*

Dear CEC Staff:

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) respectfully submits comments in response to the California Energy Commission (CEC) 15-day language in the Notice of Availability - Pre-Rulemaking Express Terms published on February 22, 2021.

AHRI represents 332 air-conditioning, heating, and refrigeration equipment manufacturers. In North America, the annual output of the HVACR and water heating industry is worth more than $44 billion. In the United States, the industry supports 1.3 million jobs and $256 billion in economic activity annually. AHRI represents the majority of North American HVACR and water heating equipment manufacturers, all impacted by changes to California's Energy Code, California Code of Regulations (CCR), Title 24, Part 6.

While the "early look" afforded by the pre-regulatory publication of the complete package of revisions is appreciated, 15-days is not reasonable to review the document in its entirety. Many of the proposals have been under the development of the CASE Team for some time; however, this is not true for all proposals. In this 15-day package, there are some cases with substantive language changes from the final CASE reports, and other cases where subtle changes require time to evaluate within the context of the entire code. AHRI is prepared to provide high level feedback at this time but anticipates more detailed comments will be submitted soon.

Mandatory Requirements for Fans – Section 120.10

Firstly, AHRI continues to have scope concerns with the proposed Fan Efficiency Index (FEI) scope. All embedded fans should be excluded as they cannot be accurately and comparably rated using AMCA 208. Section 3.1.1.5 of AMCA 208-18, below, includes the entirety of calculation methods for embedded fans. It is not written in mandatory language and cannot be used reliably to rate embedded fans with an FEI.

> ***AMCA 208 Section 3.1.1.5. Embedded fans.*** *A fan that is set or fixed firmly inside or attached to a surrounding piece of equipment whose purpose exceeds that of a fan or is different than that of a standalone fan. This equipment may have safety or energy efficiency requirements of its own. Examples of embedded fans include supply fans in air handling units, condenser fans in heat rejection equipment, tangential blowers in air curtain units and induced or forced draft combustion blowers in boilers or furnaces.*

AHRI strongly urges CEC to clearly exclude all embedded fans if there is no consistent, clear, uniform, repeatable, and reliable method to determine the FEI of an embedded fan. AHRI has proposed the following definitions for embedded fans in response to California Energy Commission Title 20 effort to regulate commercial and industrial fans and blowers:

> ***Embedded Fan***: A fan included as a component in residential, commercial, or industrial heating, ventilation, air-conditioning, refrigeration (HVACR) or water heating equipment where the fan is:
>
> - Permanently mounted in the equipment;
> - Used to support heat transfer, combustion, or other mechanisms within the equipment;
> - Tested as part of equipment certification according to ANSI, ASHRAE, AHRI, DOE or other performance standards; and
> - Labeled for such use if sold as a fan assembly only for use within an exempt product.
>
> ***Replacement Embedded Fan:***
>
> - An impeller, blade or wheel sold without a motor, with or without shaft and bearings, designed and marketed as a replacement for an existing part in an Embedded Fan, including cross-reference(s) to the original fan part and a label stating that this part is for replacement purposes only.
> - Complete Embedded Fan assemblies including cross-reference(s) to the original blower part and a label stating that this part is for replacement purposes only.

AHRI notes that 90.1 also includes a definition of embedded fan, below. The current definition in the 90.1 definition:

Embedded fan: a fan that is part of a manufactured assembly where the assembly includes functions other than air movement.

Secondly, AHRI is concerned that the FEI has been increased from 0.95 for VAV based on the assumption that the fan now has an inverter. ASHRAE 90.1-2019 set the level at 0.95 to account for the drive losses, which are still there. No justification was provided for this change. Considering that variable speed or even two-speed fans provide significantly more energy savings than a 5-percent improvement at full load, AHRI recommends CEC include the 0.95 factor for variable speed fans and remain consistent with other standards, like ASHRAE 90.1.

Thirdly, AHRI is concerned that the language, as currently proposed, in EXCEPTION 1 to Section 120.10(a) is confusing. AHRI understands the intent of, "EXCEPTION 1 to Section 120.10(a): Embedded fans that are part of equipment listed under Section 110.2, Section 110.1, or *equipment that has an efficiency standard under 10 CFR 431 that takes effect prior to January 1, 2026*" to affirmatively exclude equipment currently in the process of first-time federal regulation, for example, dedicated outdoor air systems (DOAS). However, as written, the language does not achieve that goal. Further, the inclusion of a date in the exclusion begs the question, what would happen to equipment after that date? AHRI recommends CEC review this language and make an alternative proposal to eliminate the confusion of what would happen after the date.

Fan Power Budget – Section 140.4(c)

AHRI has some concerns with the proposed regulatory text. Most importantly, based on a simplified analysis using motor power, the Fan Power Budget language, as proposed, is overly stringent. AHRI is conducting additional research and will supply more detailed comments on the impact of this stringency on equipment design.

Additionally, AHRI requests that CEC remain consistent with fan requirements. Section 120.10 includes requirements for fans with a, "combined motor nameplate horsepower greater than 1.00 hp or with a combined fan nameplate electrical input power greater than 0.89 kW." In Section 140.4(c), the scope shifts from break motor hp to motor input hp, so the 1 kW is equivalent to a 1.14 BHP motor, which includes drive losses for belts and the inverter. While this is an acceptable approach, the consideration of drive losses needs to be included in the Fan System Input Power (kW) approach. Small motors appear to exclude drive losses, with all systems assumed to be direct drive, but this will not be always the case. CEC needs to account for additional losses for electrical drives which can include both belt drive and VFDs.

Prescriptive Requirements for Space Conditioning Systems – Section 140.4

During the development of the proposed reduction of the economizer threshold from 54,000 Btu/h to 33,000 Btu/h, AHRI has expressed concern on the cost implications of including equipment not previous regulated. AHRI notes that it is not always possible to integrate an economizer with a smaller VRF system and, if not possible, the required

inclusion of a DOAS in conjunction, stands to increase the cost of the system. AHRI questions if this additional cost has been appropriately and accurately captured. CEC should ensure this analysis is correct and complete in the staff report.

Data Center Requirements – Section 140.9

Data centers are essential to public and private business operations and are considered to be mission critical. The facilities must operate around the clock for the entire year, without disruption. Reliability, redundancy, and simple design are key design principles for the architecture and mechanical systems services these spaces. Due to the high intensity and constant energy use, data centers are prime-candidates for energy-efficient design measures that can save money and reduce electricity consumption. Energy reduction measure proposals must acknowledge and adhere to the key design principles of reliability, redundancy, and simply design.

AHRI generally supports the data center proposal as written. The inclusion of refrigerant economizers as an additional prescriptive requirement reinforces the technology-neutral intent of Title 24. As written, AHRI supports the approach to preserve and expand technology options for data center owners through reasonable prescriptive requirements. CEC has recognized inherent differences between air and water/refrigerant economizers and has maintained different temperature thresholds for these technologies.

CEC should remove barriers to the installation of space heat pumps

AHRI recommends CEC evaluate certain provisions within Title 24 to further increase the adoption of space heat pumps. Residential Appendix Rated Heat Pump Capacity Verification, RA 3.4.4.2, imposes requirements for verification of system performance are based on 350 cfm per *nominal* ton; however, AHRI has consistently advocated that instead, these requirements should be based on *rated* capacity. The 350 cfm per nominal ton minimum airflow requirement is not an accurate representation of airflow rates at which systems operate. While most residential HVAC systems do operate in the 350-450 cfm per rated ton range, and most HVAC manufacturers do design their systems to operate somewhere in that range, there are some outliers to this nominal range. The optimal airflow rate for an HVAC system depends on many factors, such as the option for several different indoor coils, which can change the rated airflow for the system. Certified capacity and airflow rates are publicly available on the AHRI Certification Directory. Inspectors can easily find rated capacity and airflow rates in the AHRI Certification Directory, the same place CEC permits for the look up of heat pump capacity at 17 °F. CEC should allow airflow rates that are utilized to achieve federally mandated minimum efficiency performance.

AHRI urges CEC to address the artificially low performance required when modeling variable capacity heat pumps (VCHP) in the Alternative Calculation Method (ACM) Reference Manual and the residential California Building Energy Code Compliance (CBECC-Res) performance compliance software used for demonstrating compliance with the Performance Standards specified in Title 24, Part 6, Section

150.1(b). CEC responded to five years of AHRI advocacy by adopting modest credits for heating and cooling; however, modeling ductless heat pumps as barely more efficient than a split system equivalent to the standard design with default duct conditions (minimum efficiency) is misrepresentative and presents a barrier to California consumers adopting more efficient technologies. CEC should consider permitting the use of rated efficiencies for these products in the ACM and CBECC-Res performance compliance software program.

Lastly, in response to CEC's recent Flexible Demand Appliance Standards December 14, 2020 stakeholder workshop,[1] AHRI noted that harmonization with industry standards, such as AHRI Standard 1380 (I-P/2019): Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications (AHRI 1380), will allow manufacturers the ability to produce heat pumps for a broader market. Again, AHRI urges CEC's efforts be geared towards incentivizing the adoption of DR-products (e.g., performance compliance credits) and to not limit product availability for consumers.

AHRI supports CEC maintaining consumer's energy choices

AHRI agrees with CEC's assessment that moving to an all-electric baseline in 2022 is premature. On January 26, CEC correctly identified that neither the market, nor the workforce is ready to support electric only new construction. Technicians of heat pumps must be trained to the latest of both technical and professional standards. Title 24 is also not ready for policies limiting a consumer's choice to freely select equipment regardless of energy used. Rather than regulations preventing the use of energy sources for space- and/or water-heating, CEC should focus on financial incentives for reducing carbon emissions through policies that encourage the installation of equipment that reduces carbon emissions and structural updates that reduce the amount of energy needed for space- and/or water-heating. It is imperative that CEC preserve the flexibility for equipment to use any energy source when it is more practical, economical, and environmentally beneficially to do so.

If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

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[1] AHRI Comments in Response to the December 14, 2020 Lead Commissioner Workshop on Senate Bill 49 Flexible Demand Appliance Standards and December 9, 2020 Staff Paper, Introduction to Flexible Demand Appliance Standards *[Docket Number 20-FDAS-01]*