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Lennox Comments - CEC Title 24-2025 Residential HVAC Performance

Additional submitted attachment is included below.



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September 5, 2023

Bach Tsan, P.E.
California Energy Codes and Standards Team
California Energy Code (Title 24, Part 6)

Submitted via: CEC Docket 22-BSTD-01
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Re: Lennox Comments regarding California Energy Code 2025 Pre-Rulemaking, Residential HVAC Performance

Lennox International Inc. (Lennox) hereby submits comments on the Codes and Standards Enhancement Proposal for the 2025 California Energy Code (Title 24, Part 6) regarding the Residential HVAC Performance Pre-Rulemaking Proposal.

Lennox is a leading provider of climate control solutions for the heating, air-conditioning, and refrigeration (HVACR) equipment markets based in the United States. Lennox is a publicly-traded company and has thousands of employees. Lennox manufactures HVACR products, equipment and control systems subject to California Energy Commission (CEC) requirements.

Lennox supports CEC's goals of improving energy efficiency exemplified by Lennox's tradition of innovation in the HVAC industry and consistent leadership regarding product efficiencies. Lennox offers the following comments on the Residential HVAC Performance Pre-Rulemaking Proposal.

A. General Comments on the NOPR.

California is clearly leading efforts to aggressively decarbonize and reduce emissions and the ongoing review and update of the California Energy Code (Title 24, Part 6) is a key component to support these objectives. Lennox generally supports the review and update of the code for the 2025 code cycle to further these objectives, but reiterates the Codes and Standards Team use caution to ensure the proposed measures yield meaningful results while not overly burdening California consumers and manufacturers of HVAC product with measures that increase cost and do not produce meaningful results.

B. Specific NOPR Issues on Which DOE Seeks Comment.

In addition to the above general comments, Lennox offers the following comments on the specific measure proposals. The comment period is a short two weeks from the stakeholder meeting held on August 23, 2023. Lennox may not be addressing each issue fully or other issue in the Code at this time but respectfully request the opportunity to further comment or engage

with CEC staff directly as the Title 24-2025 Rulemaking process proceeds. The comments below include the proposed measure topics followed by Lennox's response.

Residential HVAC System Design

Proper load calculation is fundamental to support quality installations. Lennox fully supports sound industry accepted load calculation practices and provides training, support and tools to encourage them to our distribution and dealer partners.

Lennox fully supports the intent of the CEC proposal to require documentation of the system design, load calculation and sizing which is not likely an issue for contractors who are currently following the permitting and code requirements. The real issue remains of ensuring compliance broadly to gain the intended energy savings.

Supplemental Heat

Lennox supports the proposal to add lock out or change over controls to heat pump systems but finds that a single setpoint of 35 °F may not satisfy consumer comfort expectations in all applications. While a properly sized and quality installed heat pump will satisfy the majority of the heating load in many California applications each application is different dependent on local climate and building construction. Changeover or lock out should be set accordingly per the application to maintain consumer comfort and operating cost expectations. In response to earlier comments it was suggested 35 °F was a good "starting point" and Lennox would not oppose this, but it should not be an absolute if the selected product is not maintaining consumer comfort or affordability. Changeover or lock out should be set accordingly per the application to maintain consumer comfort and operating cost expectations.

CEC should be clear in the language that control of Electric Heat does not have to be integral to the factory system that external controls or room thermostat with this capability is acceptable for compliance.

Defrost Function

Lennox generally supports setting of defrost controls, where applicable, to 90 minutes or more for most California climates. But many systems on the market today are not simple time/temperature controlled but rather demand defrost control that regulate defrost intervals as needed to maintain system performance. These systems are controlled by algorithms developed to optimized defrost performance and the timing intervals are not field selectable. In addition, not all time/temperature controls have setting of 90 minutes or more but this should not preclude this equipment from being used in California if it meets the DOE standard levels.

CEC should clarify that the 90 minute or more setting is to be applied where applicable and does not apply to demand defrost controls unless the time interval can be manually adjusted. And/or that the maximum time interval allowed by the control be used if less than 90 minutes.

Crankcase heating

Lennox generally supports the CCH prescriptive requirements to use either an Occupant Controlled Smart Thermostat (OCST) or control the CCH as specified in the proposal. Most if not all Lennox products that employ CCH's already control them in a manner that meets the prescriptive requirements as proposed.

While the current proposal is understood, Lennox further recommends that CEC clarify that the language that the OCST is not intended to control the CCH. That the intention is that the OCST benefits offset increased energy use for CCH that are not controlled and that this is an alternative to the CCH control measures specified in the proposal.

Refrigerant Charge Verification

Lennox supports weigh in charge procedures for HVAC equipment where system balancing or full refrigerant charging is required. Lennox finds that the proposal has made improvements from earlier proposal to streamline the process which Lennox supports. Lennox would like to review the proposal requirement further to determine if further comment to improve are appropriate.

Variable Capacity System

Lennox again asked if the proposed additional requirements for Variable Capacity/Zoned systems will produce the required results or will be an inhibitor to higher efficiency system as it increases the burden to verify airflow in all zones. Additional requirements likely drive additional installation cost that will be considered in consumer product choice. While Lennox understands the intention we recommend consistent requirements across product types and not differentiate based upon efficiency or zoning. Lennox would like to review the proposal further for additional comment.

An area of concern of potential concern regards zone control. Consideration needs to be made for minimal compressor capacity on both variable speed and multi-stage systems to make sure the AHU minimum air flow matches minimum system capacity. For central elected systems, if there is a zone smaller than minimum capacity, there will likely need to be a "dump" zone for the remaining air and capacity. That dump zone will likely be less than 350 CFM/ton.

Minimum Airflow Requirement

A further general statement regarding the 350 cfm/nominal ton requirement. Systems are not always designed for nominal capacity values of 12,000 Btu/h per ton and the airflow values should not be targeted to "nominal values", nor is 400 cfm/ton always the target or specified airflow. Systems designs are optimized to meet market needs and while a general rule of thumb is to target capacity within 5% of nominal, systems designs may be targeted for values which

vary greater than 5% from nominal. This may be particularly true for larger tonnage models but is applicable to all sizes. Further airflow levels are optimized for each system and its targeted performance, in some instances values below 350 cfm/ton improve performance.

Considering this, CEC should at a minimum consider moving the 350 cfm minimum requirement from nominal tonnage to the actual rated capacity. This will provide consumer benefits as it may defer duct alterations, improve airflow efficiency and better match the manufacturer rated values. Using the nominal values tends to force increased airflow levels that may not be required for the system or application as the system was not designed for nominal capacity.

In summary, Lennox appreciates the opportunity to provide input on the CEC Pre-Rulemaking proposal. Lennox recommends that CEC consider the issues presented in these comments and recommendations provided. As noted Lennox would like to further analyze the Pre-Rulemaking proposal in its entirety and provide further input or discuss with the CEC directly regarding.

Sincerely,

A handwritten signature in cursive script that reads "David Winningham".

Dave Winningham,
Sr. Engineering Manager, Regulatory Affairs