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On 2019 Title 24, Part 6, Building Energy Efficiency Standards Rulemaking

Additional submitted attachment is included below.

Goodman
a member of DAIKIN group

May 7, 2018

California Energy Commission
Docket Unit, MS-4
Docket No. 17-BSTD-02
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Comments on 2019 Title 24, Part 6, Building Energy Efficiency Standards Rulemaking

Dear California Energy Commission Staff:

Goodman Global, Inc. ("Goodman") submits the following comments in response to the California Energy Commission's ("CEC") 15-day Title 24 language, published on April 20, 2018.

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 state.

Goodman has organized our comments into six major sections. After an initial overview, we have four sections addressing various issues raised in the 15-day Title 24 draft, followed by a closing statement. Goodman very much appreciates the opportunity to submit comments.

I. Overview

Goodman has several concerns on such proposed revisions to Title 24 as well as some existing provisions. Certain proposed revisions in the 15-day Title 24 draft are substantive, and were not mentioned in the 45-day Title 24 draft (e.g. removal of the 10 ft duct length provision), and supporting technical details have not been made available to stakeholders for consideration during this 15-day process. As we go into more details in the following sections on the substantive revisions introduced between the 45-day and 15-day drafts of Title 24, we request CEC to consider the significant adverse effects these substantive revisions will have on consumer choice without all stakeholders having the opportunity to review justification.

II. Nonresidential Section 120

For Section 120.1(c)1, an Exception should be added at the end of subsection 1 stating the following: "EXCEPTION 1 to Section 120.1(c)1: Mechanical system types not described in Section

120.1(c)1.A." We believe this proposed Exception will help reinforce the original intent of the proposed Title 24 language.

Exception 3 of Section120.2(e)3 should be removed altogether since even if such systems have a readily accessible manual shut-off switch, there is no guarantee that the occupant would shut off the system prior to leaving the hotel room.

For Section 120.3(a), we propose adding the word "interconnecting" following "General Requirements. The" and before "piping conditions listed below…" as the word "interconnecting" further clarifies that factory-installed piping within HVAC systems are exempt from these requirements. With regard to Table 120.3-A, the "Fluid Operating Temperature Range (°F)" column specified in the first column should be expanded to specify that it is the "Fluid Operating Temperature Range (°F) at Standard Operation" of the system. The rationale here is to exclude onerous and expensive insulation requirements in limited instances where fluid temperature ranges are high. Outside of standard operating conditions, refrigerant temperatures can exceed the listed standard operation temperatures, but such instances constitute a negligible fraction of the equipment's lifetime operating hours. Mandatory insulation requirements should apply to only standard operating conditions, as those conditions are representative of the vast majority of the equipment's operation.

III. Low-rise Residential Sections 150 and 150.1 , and High-Rise Residential Section 120.1(b)

i. 350 CFM Per Nominal Ton

The current Title 24 requirement is based on nominal ton and should be revised to rated ton. ***CEC should allow airflow rates that are utilized to achieve federally mandated minimum efficiency performance.*** Requiring airflow rates that are different from those used to certify federally mandated standards is a major concern for us. Even in the Codes and Standards Enhancement (CASE) report published in December 2017 titled "2019-RES-HVAC1-F Revised December 2017," the Statewide CASE Team recommended the Energy Commission to consider changing the CFM per nominal ton rating to CFM per ton at rated AHRI conditions. The report stated that the change will correct for the wide variations in nominal vs. rated capacity, and will more accurately reflect air conditioner performance as it is affected by airflow.[1] We wholeheartedly agree with this recommendation and have the following additional comments:

a. The 350 cfm/nominal ton minimum airflow requirement is not an accurate representation of airflow rates at which all OEMs operate their systems. While most residential HVAC systems do operate in the 350-450 cfm/rated ton range, and most HVAC OEMs do design their systems to operate somewhere in that range, the key word is most. There are some outliers to this nominal range.

[1]2019 Title 24, Part 6 CASE Report – 2019-RES-HVAC1-F Revised December 2017, page 77 under the "Conclusions" section.

b. The optimal airflow rate for an HVAC system depends on a multitude of factors, which is why there is a range of airflows at which HVAC OEMs rate their systems.
c. Certified airflow rates are publicly available on the AHRI Certification Directory.[2]

ii. Proposed fan efficacy requirement of 0.45 w/CFM

CEC should consider the following issues while removing the proposed 0.45 w/CFM requirement:

a. Several issues exist within the November 2017 "2019-RES-HVAC1-F Revised December 2017" report:
    1. The lab tests associated with this report did not account for single package units. The CASE report indicates that for heat pumps, "cabinet and blower design can have a large effect on internal resistance to airflow."[3] We believe this holds true for single package products as well, and would recommend CEC to analyze the fan efficacy results prior to revising the fan efficacy requirement.
    2. The underlying assumption behind the proposed 0.45 w/CFM was that all furnaces equipped with ECMs will pass the FER test. However, this was not the case when tests were performed for 10 furnaces equipped with ECMs. Per Table 36 of the report, there are at least 31 instances where fan efficacies for furnaces equipped with ECMs would exceed the 0.45 w/CFM minimum. The results were also based upon tests performed in an environmental chamber that controlled temperature and relative humidity in accordance with the referenced test standards, so it is likely that field measured fan efficacies would have resulted in much more than 31 occurrences of the proposed measure not being met.
b. HERS providers such as CHEERS and CalCERTS have HERS registries, and CEC should review portions of the collected data to determine the fan efficacy values being recorded today. It was mentioned by one of these HERS providers during the 10/5/2017 public workshop that a majority of the furnace installations are struggling to meet the current 0.58 w/CFM requirement, even the condensing furnaces with ECMs.[4] This is primarily due to the fact that the fan efficacy as an efficiency metric is also dependent on duct design and filter, and if ACCA Manual D is not followed properly, furnaces with ECMs also end up getting penalized. The HERS registries provide access to field measured fan efficacy data for several homes, and would allow CEC to evaluate a large sample size representative of actual field performance. An uncertainty analysis should be performed on all field measurements, and compliance should be based on being within the field measurement +/- uncertainty. (Due to inaccuracy of field measurements as opposed to laboratory measurements.)

[2]https://www.ahridirectory.org/Search/SearchHome?ReturnUrl=%2f
[3]2019 Title 24, Part 6 CASE Report – 2019-RES-HVAC1-F Revised December 2017, page 75 under the "Heat Pump Test Observations" section.
[4]Comments from Mr. Hodgson on pages 55 and 56 of the following meeting transcript: http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN221835_20171120T105843_Transcript_of_the_1052017_Staff_Workshop_on_the_Draft_2019_Buil.pdf

c. The inherent assumption with the proposed measure is that all PSC furnaces will be sold or installed prior to 1/1/2020, which is not the case. DOE FER compliance date is 7/3/2019 whereas 2019 Title 24 compliance date will be 1/1/2020. This means our new construction builder customers will have only 5 months to switch over to gas furnaces with ECMs or X13 motors. CEC staff should consider linking the reduced w/CFM requirement with date of manufacture of the product, so that any furnace manufactured prior to 7/3/2019 can be installed well after 1/1/2020 in newly constructed homes and inventory is not stranded.

iii. Removal of the 10 ft Ductwork Length Provision in 15-day Draft

For the air filtration requirements specified in Sections 150.0(m)12.A and 120.1(b)1.A.i, the 15-day language proposes the deletion of the 10 ft (3m) ductwork length provision even though the 45-day language and prior editions of Title 24 have specified this provision. No documentation supporting this proposed revision was uploaded along with the 15-day language to the 17-BSTD-02 docket, so we are unable to determine the rationale behind this proposed revision. The proposed revision is a major one and CEC staff should reconsider this at the next rulemaking cycle once public stakeholders are given sufficient time to respond to the supporting technical reasons. One issue with this late proposed revision is that it will lead to significantly higher fan power consumption for some HVAC systems and reduced airflowas many of these HVAC products designed to be operated with very short ducts have very little "static capability." The 10 ft (3m) ductwork exception provision should be added to the proposed Section 120.1(c)1.A.ii as well. Lastly, an exception should be added to all these sections specifying that if a separate air filtration system serves the occupied space, no additional air filter is required for the HVAC and duct system.

IV. Comments on Section 110.12

We support the revisions to Section 110.12(a) in the 15-day language as it allows flexibility around the virtual end node, as compared to the proposed 45-day language. We would like to thank CEC staff for addressing the stakeholder concerns raised on this issue during the comment period associated with the 45-day language.

With regard to the proposed Sections 110.12(b)1 and 110.12(b)2, CEC staff should consider adding the following proposed revisions since energy management mechanisms should not be limited to just temperature set point adjustments:
Proposed change to Section 110.12(b)1 in underlined text – "The controls shall have a capability to remotely increase the operating cooling temperature set points by 4 degrees or more, or adjust the capacity of the outdoor unit in all non-critical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS)."

Proposed change to Section 110.12(b)2 in underlined text – "The controls shall have a capability to remotely decrease the operating heating temperature set points by 4 degrees or more, or adjust the capacity of the outdoor unit in all non-critical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS)."

V. Comments on Filter Pressure Drops Specified in Sections 120 and 150

Both Sections 120 and 150 incorporate the proposed revision specifying a maximum clean-filter pressure drop of 0.1 inches water at a 1" depth. This will end up significantly limiting consumer choice. We recommend CEC to consider increasing the pressure drop to at least 0.2 inches of water based on our review of the currently available filter options.

VI. 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, Director of Regulatory Affairs at either 713/263-5906 or rusty.tharp@goodmanmfg.com.

Sincerely,

Nathan Walker/axr

Digitally signed by Nathan Walker/axr
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