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Re: 17-BSTD-01: Sierra Club Comments on the Draft 2019 Building Energy Efficiency Standards

Additional submitted attachment is included below.

SIERRA CLUB
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November 29, 2017

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Re: 17-BSTD-01: Sierra Club Comments on the Draft 2019 Building Energy Efficiency Standards

To the California Energy Commission:

The Sierra Club California thanks you for giving us the opportunity to comment on the proposed Express Terms for the 2019 Title 24 part 6 building energy efficiency standards on October 20, 2017. We would like to add additional comments included in this letter.

The Sierra Club seeks to protect and preserve the environment of California and the world. This set of revised building efficiency standards helps place California on a path towards a future where all buildings are zero net energy and are healthy places to work and live. We are supportive of the most of proposed changes in the express terms with recommendation for improvement to a few sections.

The Sierra Club advocates for the health of people and the environment. In addition to commenting on the energy efficiency features of the Commission code change proposal, this letter also discusses the effect of the proposed code requirements on: reducing automobile emissions, reducing harmful flicker, providing sufficient ventilation for improved indoor air quality, improving air filtration and reducing toxic emissions in laboratory spaces.

We support California's goal to reduce greenhouse gases by 80% by 2050. The progress that has been made in the Title 24 part 6 requirements for new residential construction gets us close to the intermediate 2020 goal of all new homes being zero net energy (ZNE). We congratulate the Commission on their efforts to make this goal a reality. Thus we support the near ZNE performance requirements proposed for Section 150.1(b) and prescriptive requirements for high levels of energy efficiency in the entire standard and prescriptive requirements for renewable energy to approach ZNE in Section 150.1(c)14.

The Sierra Club has consistently supported the conversion of the energy supply system from nonrenewable and polluting energy sources to renewable and clean energy sources. When it comes to building standards we support a "loading order" of first maximizing cost-effective energy efficiency and then applying renewable energy and energy storage to approach cost-effective implementation of zero net energy homes. The reasons behind maximizing energy efficiency, especially that of the building envelope include:

- Long life of building envelope components. Some envelope components such as wall assemblies can last in excess of 50 years. The life cycle value of long lived envelope components when compared against renewable energy systems and storage systems that have half the expected useful life cannot be compared on their annual relative savings.
- Lost opportunities. Envelope features have relatively low incremental costs for increasing their energy efficiency when first installed but can be prohibitively expensive as a retrofit. Adding additional renewable energy systems after the fact do not have the same cost differential as compared to at the time of new construction.
- Resource conservation. The larger the building load, the larger the renewable energy systems and grid support required to serve the load. It is more economic to reduce the loads first instead of over building the renewable energy infrastructure.

- Building resiliency. Buildings with more efficient envelopes are able to "ride through" power outages more readily and with this added resilience provide more protection of inhabitants during heat storms and natural disasters.

Thus we support the Commission's approach to requiring a sufficiently low Energy Efficiency Design Rating before considering the contribution of renewable energy systems. This assures the building has minimized its energy loads before evaluating the benefits of renewable generation. After loads are reduced, the Solar Electric Generation and Demand Flexibility Design Rating associated with the renewable energy system and storage is subtracted from Energy Efficiency Design Rating to yield the Total Energy Design Rating. The total design rating targets have been selected so the resulting home is both cost-effective and is near ZNE. We hope that in future iterations of this standard, the building loads will include the loads associated with charging electric vehicles.

If California is going to meet its greenhouse gas goals and meet air pollution goals, transportation will need to be decarbonized with low or zero criteria emissions. Residences of all types should be constructed with dedicated charging circuits and plugs so electric vehicle use is supported. This provision is a "lost opportunity" as it is substantially less expensive to install a circuit and receptacle during construction than to install it later on. We ask the Commission to propose this EV charging receptacle requirement either for Title 24, part 6 or for the 2019 updates to CALGreen (Title 24, part 11) as a new mandatory provision.

We are pleased to see the updates to the Indoor Lighting Power Densities in Section 140.6 and the Allowed Outdoor Lighting Power Allowances in Section 140.7; these changes are based on embracing LED's as the reference light source in the future. The installed power reductions are significant but are consistent with common practice for new lighting installations. Given the projections by USDOE[1] for future solid state lighting (including LED) efficacy increases of around 20%, we recommend that the CEC consider carefully if the conservativism built into the allowances are needed. We note that IALD, representing independent lighting designers, are questioning whether the Additional Power for Tunable White & Warm Dim is really needed.[2] We recommend that the Commission revisit this color tuning allowance and consider whether this allowance is necessary. Can color tuning be provided within the current construct of lighting power densities, additional lighting power allowances and the Power Adjustment Factor for advanced controls?

We would like to see the same efficiency gains for lighting controls as for lighting power. As a result, we would like to see the motion controls requirements for parking lot lighting restored in Section 130.2 and the advanced controls requirements for after-hours use incorporated into the 2019 standards as described in Statewide Utility Codes and Standards Team letter.[3] Besides the environmental benefit associated with less energy consumption, these advanced controls reduce the disruptive biological impact of light late at night while maintaining safety when activity is sensed.

We appreciate the efforts taken to accommodate warmer color temperatures when developing the outdoor lighting power allowances whether it is for community preference or in response to the AMA guidance on reducing blue light from outdoor lighting.[4] Given the Commission's sensitivity towards color temperature, we are hopeful that a similar careful approach might be taken towards flicker. In 2016, the Commission adopted a conservatively high (lax) flicker standard in Joint Appendix JA8 of Title 24 due to there being little information on the flicker characteristics of products on the market. However the 2016 Title 24

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[1] Table E.6 *Average LED Lamp and Luminaire Efficacy Projections by Sector and Submarket*. Navigant Prepared for USDOE. Energy Savings Forecast of Solid-State Lighting in General Illumination Applications. August 2014. http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/energysavingsforecast14.pdf

[2] http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN221604_20171023T224926_John_Martin_Comments_International_Association_of_Lighting_Desi.pdf

[3] http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-01/TN221679_20171103T170734_Statewide_Utility_Codes_and_Standards_Team_Comments_Statewide_U.pdf

[4] https://www.ama-assn.org/ama-adopts-guidance-reduce-harm-high-intensity-street-lights

standard required that products installed into new homes be tested for flicker and the data posted in a public (JA8) database which could be directly compared against the IEEE PAR 1789 Standard, "Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers." It should be noted that the IEEE standard recommends half the flicker value than the current Title 24 criteria. Close to 10,000 products complying JA8 have posted their data. We recommend this data be analyzed and the results considered on whether the current Title 24 required flicker value should be dropped to a more protective value. We concur with the Utility Codes and Standards Team that the JA10 data should continue to be published in Joint Appendix JA8 under the revised 2019 standard and not be replaced with the NEMA 77 Pst and SVM metrics which cannot be directly compared to the low risk recommendations in the IEEE standard. We also recommend that the changes to Section 150.0(k) be restored to the original requirements in the 2016 version of Title 24. The proposed changes would render the standards more difficult to enforce and would undermine the JA8 high efficacy specifications by applying them to only some of the luminaires in new homes.

We are concerned with the reduction in outdoor air ventilation rates in Section 120.1 to align with ASHRAE 62.1 values.[5] As shown near the end of the Nonresidential Ventilation & Indoor Air Quality (IAQ) CASE report,[6] the ASHRAE 62.1 ventilation values are consistently lower than the ventilation rates in Title 24. When occupied to design levels, the expected CO2 levels for some applications exceed 2,000 PPM. In comparison the design CO2 levels for demand controlled ventilation is 1,000 PPM. The concern is that the loss in productivity, and losses associated with increased absenteeism and illness outweighs the energy savings benefits. We recommend that the Commission revisit the proposed changes and consider either keeping the current Title 24 ventilation rates or 130% of ASHRAE 62.1 ventilation rates.[7]

We support the Commission's proposal to require MERV 13 filters in all ducted heating and cooling systems and supply ventilation systems in residential and nonresidential buildings. Small particulate pollution is a significant problem in California and can lead to a number of respiratory diseases including lung cancer. The current minimum filtration of MERV 8 is ineffective at capturing the very fine particles that have a diameter less than 2.5 microns.

A significant fraction of particulates in the home are generated while cooking. Source capture and exhausting these pollutants is better than spreading these cooking based particulates and compounds throughout the house. Thus we are supportive of testing the vented kitchen exhaust hood added in Section 150.0(o)2B. However the proposed standard talks about verification of the flow rates from the hoods rather than the requirement for the hood itself. We recommend that the proposed standards directly state that kitchen hoods are required above ranges and they are vented to the outside.

We also support the introduction of fume hood automatic sash closing devices into Section 140.9(c) of the building standards. In addition to the energy savings benefits of automatically closing fume hood sashes, these devices provide an extra layer of protection to people and buildings. Automatically closing fume hood sashes reduces the chance of toxic fumes entering the laboratory space; it also reduces the chance that an explosion or fire will spread outside of the fume hood and harm the fume hood operator or other people in the lab. In the California Building Code, doors that provide a fire separation or a fire separation are required to be self-closing or automatically closing. We think similar requirements should apply to fume hoods for both safety and energy efficiency reasons. We also recommend that the code require fume hood sashes to have the capability to be configured to automatically close the sash but not automatically open the sash. This prevents the possibility of someone approaching a fume hood and it automatically opening

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[5] ASHRAE 62.1-2016 Ventilation for Acceptable Indoor Air Quality. American Society of Heating Refrigerating and Air-conditioning Engineers.

[6] http://title24stakeholders.com/wp-content/uploads/2017/09/2019-T24-CASE-Report_NR-IAQ_Final_September-2017.pdf

[7] 130% of ASHRAE 62.1 ventilation rates results in an indoor environmental quality credit from LEED, similarly compliance with the California Standards receive a number of credits including the minimum indoor air quality prerequisite and indoor air quality management plan https://www.usgbc.org/california-leed-acps

while a violent reaction is occurring inside the fume hood. Instead a manual control or a foot pedal should initiate sash opening. If the risk of violent reactions is low, the operator could reconfigure fume hood for automatic open operation but this should not be the default but an operator option after consideration of the risks.

To reiterate, the Sierra Club is very supportive of most of the proposed changes in the draft express terms. We have suggested a few changes that we believe will improve the energy efficiency and public health features of the standards . We are very pleased to see that the Commission has conducted a careful analysis of near Zero Net Energy Homes and has concluded that they are cost-effective and feasible within the code context and are pursuing this state policy in the 2019 standards. Please contact us if you have questions about these comments.

Sincerely,

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