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Comments on Staff Workshop on Residential Solar PV, Storage, the EDR and Grid Integration Impacts for the 2019 Building Energy Efficiency Standards

Additional submitted attachment is included below.

August 31, 2017

Via electronic submittal/e-commenting:
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California Energy Commission
Building Standards Office

Subject: Sierra Club Comments on the Staff Workshop on Residential Solar Photovoltaic, Storage, the Energy Design Rating and Grid Integration Impacts for the 2019 Building Energy Efficiency Standards (Docket #17-BSTD-01)

The Sierra Club appreciates the opportunity to provide these comments to the California Energy Commission ("Commission") on the 2019 Building Energy Efficiency Standards ("Standards"), as presented and discussed at the Staff Workshop on Residential Solar Photovoltaic, Storage, the Energy Design Rating and Grid Integration Impacts on August 22, 2017.

I. Introduction

The Sierra Club supports the Commission's ongoing effort to achieve cost-effective energy savings and greenhouse gas emission reductions through the adoption of updates to the Title 24 Building Energy Efficiency Standards. We appreciate the significant amount of work that went into updates for the workshop on August 22, 2017.

The Commission has an important opportunity in the 2019 code cycle to ensure the Building Energy Efficiency Standards effectively implement California's energy, climate, and zero net energy ("ZNE") building mandates. These targets are ambitious, but achievable. At a high level, the Commission can help California achieve these goals through updated Standards that support buildings being efficiently powered and heated by renewable energy, utilizing onsite PV, and harmonizing with the needs of the grid.

There is growing consensus that California will not achieve its climate goals in a cost effective manner if we delay electrifying gas end uses in residential and commercial buildings. This entails replacing gas water and space heaters with high-efficiency electric heat pump appliances. Lawrence Berkeley National Lab and UC Berkeley recently released the report "Scenarios to decarbonize residential water heating in California" (attached to these comments), which finds that fuel substituting from gas to electricity for water heating without the forced

retirement of existing equipment **cannot wait beyond 2020** for California to achieve the 2050 emissions goals.

Sierra Club urges the Commission to update the Standards in a manner that provides a clear market signal that code compliance will increasingly mean not just "zero net energy," but deep decarbonization of buildings via a transition to all-electric high efficiency buildings powered by onsite or community PV and a clean grid. Indeed, the LBNL report describes:

> *For decarbonization of buildings, sustained policies over time could be conducive to provide consistent policy signals to the equipment manufacturing industry to anticipate and plan for potential new demands. This would also provide lead time for grid planners and utilities to plan for additional electricity load.*

The 2019 Code Cycle is the appropriate time for the Commission to begin to align the Standards with California's 2030 and 2050 climate goals by deeply decarbonizing homes and buildings in California.

With respect to the August 22nd workshop, our recommendations are to:

1) Ensure energy efficiency measures are not jeopardized by beyond-code PV credits
2) Prevent loopholes in the solar PV requirement for new buildings
3) Establish an electric reference building baseline for space and water heating
4) Update the code to more accurately account for the costs of gas infrastructure
5) Approve the Renewable Water Heating Compliance Option in the 2016 Reach Code

II. The Commission should ensure energy efficiency measures are not jeopardized by beyond-code PV credits

Strong energy efficiency requirements in the 2019 code are needed to implement California's energy and climate mandates. The Sierra Club supports the Commission's proposal to require buildings to comply with energy efficiency standards *first* through an Energy Efficiency Energy Design Rating (EE EDR), and then meet a more comprehensive EDR score that includes the contribution of rooftop photovoltaics (PV).

Given market developments in the buildings sector and new PV requirements in the 2019 code, as well as the overarching need to deeply decarbonize buildings and electricity generation, the Commission should not discount energy efficiency requirements for buildings through a beyond-code PV credit. Since the 2019 Code will require that PV offsets 100% of the electricity use of new buildings,[1] the Commission should not offer an additional PV credit for more solar *if* this means decreasing energy efficiency requirements. Energy efficient "high performance"

[1] Appropriately using the baseline of electricity use in a mixed-fuel building so as not to penalize all-electric buildings with more costly PV requirements

buildings that use tightly sealed walls, attics, doors and windows are critical to (1) decrease use of carbon-intensive gas heaters, as well (2) reduce electric load when rooftop and utility-scale PV production drops (i.e. in the evening and winter mornings) in order to avoid the use of high-polluting and expensive gas peaker plants. Ensuring high performance buildings are the new norm in California can help decrease evening cooling loads, and thereby mitigate evening ramping challenges.

III. The Commission should prevent loopholes in the solar PV requirement for new buildings.

Sierra Club supports the Commission requiring buildings to offset 100% of annual electricity use[2] through rooftop or potentially *local* community-based solar PV. This PV prescriptive requirement will help lower the cost of electricity for residents, increase penetration of renewable energy, and reduce GHG emissions by encouraging residents to shift from gas to electric end uses. In order to avoid loopholes to the PV requirement, we urge the Commission to (1) clearly define conditions for an exception to the requirement, and (2) establish alternative requirements for buildings that meet those conditions. Alternative requirements will ensure that all buildings in California (even those that are shaded or otherwise not suitable for solar) contribute to the state's renewable energy, energy efficiency, and greenhouse gas reduction goals. Alternative requirements could include participation in local community solar projects, additional energy efficiency measures, or grid flexibility measures (e.g., grid connected electric water heating, pre-cooling, etc).

IV. The Commission should establish an electric reference building baseline for space and water heating.

Sierra Club is encouraged to hear that the Commission is working on an independent compliance path for both mixed-fuel and all-electric buildings. As the Sierra Club, NRDC, 350 Bay Area, and others have stated in previous comments, mixed-fuel and all-electric buildings need independent code compliance paths for both the prescriptive and the performance path. Since most new construction complies with the code via the performance path, we urge the Commission at a minimum in the 2019 Code to establish an all-electric performance baseline. As described at length in previous comments, the code currently creates a significant obstacle to building low- or zero-carbon energy efficient all-electric homes because electric buildings are compared with a mixed-fuel building baseline.

[22] Ibid.

V. The Commissions should account for gas connection costs when considering the cost effectiveness of mixed-fuel buildings

The Commission should include the costs of new gas infrastructure (i.e. cost of extending distribution main lines under the street, connecting gas from the street to the building, installing gas meters, plumbing the house or apartment building with gas piping, and exhaust venting) when assessing the cost-effectiveness of mixed-fuel buildings. Gas connections are very costly, and can run as high as $14,000.[3] Failing to account for these costs creates a bias toward gas space heating and water heating. If gas connection costs were accounted for then we anticipate all-electric homes would be more cost-effective in the Code, unlocking the opportunity for a transition to needed high-efficiency low-carbon all-electric homes and buildings.

VI. The Commission should approve the Renewable Water Heating Compliance Option in the 2016 Reach Code

Sierra Club joined NRDC and eleven other stakeholders in May 2017 asking the Commission to add a "renewable water heating" option to its solar PV model ordinance. This reflects the need for the Commission to address the emissions from and energy used by thermal end uses such as water heating and space heating. As described in the earlier comments, direct use of fossil fuels, primarily natural gas, for thermal end uses in residential buildings is responsible for a roughly equivalent amount of GHG emissions in California as all electricity used in these buildings, and cannot be offset by solar PV.[4] The 2016 Reach Code is an important opportunity to save energy and reduce GHG emissions through the deployment of electric heat pump water heaters and solar thermal water heating instead of more carbon and energy intensive natural gas water heating systems.

Several local jurisdictions have expressed interest in the renewable water heating code. We ask the Commission to approve this optional addition to the reach code to facilitate adoption by local jurisdictions eager to lead the state in cutting GHG emissions from energy use in buildings.

VII. Conclusion

Thank you for your consideration of the concerns raised in these comments. We would welcome the opportunity to discuss any of these issues further.

[3] Comments by Stone Energy Associates docketed after the April 20, 2017 workshop

[4] Jones C., Kammen D., "Bay Area Consumption-Based Greenhouse Gas Emissions Inventory", Jan. 2016, http://www.baaqmd.gov/research-and-data/emission-inventory/consumption-based-ghg-emissions-inventory

Dated: August 31, 2017

Respectfully submitted,

/s/

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