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SEIA CALSSA Title 24 - 2019 BEES 45 Day Language Supplemental Comments

Additional submitted attachment is included below.

March 5, 2018

Commissioner Andrew McAllister
Energy Commission Staff
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Docket 17-BSTD-01 2019 Building Energy Efficiency Standards Pre-Rulemaking: 2019 Residential Standards: Residential Solar Photovoltaic, Storage, Solar Thermal, Energy Design Rating and Grid Impacts;

Dear Commissioner McAllister and staff:

I. INTRODUCTION

The Solar Energy Industries Association (SEIA®) and the California Solar & Storage Association (CALSSA) [formerly the California Solar Energy Industries Association (CALSEIA)] continue to appreciate the efforts of the California Energy Commission (Commission) to promote energy efficiency and to promote the development of renewable energy in striving towards Zero Net Energy (ZNE) goals.

SEIA and CALSSA have submitted joint comments in response to previous CEC Workshops and appreciate the opportunity to continue to provide input and guidance to the Commission. These letters supplement our comments from previous stages including those included in our joint letters of October 20, 2017 and February 21, 2018.

II. SUPPLEMENTAL COMMENTS ON PV AND ENERGY STORAGE

A. PV+ESS compliance credit should be allowed at a higher cap for homes in the all-electric case. This would provide an attractive option for builders to fully electrify homes, further reducing GHG emissions.

Considering sizing of PV systems in Section 150.1(c)14 is based on a dwelling's estimated annual electrical usage for the mixed-fuel case, we further recommend additional compliance credit for sizing of PV systems greater than the

mixed-fuel estimate of electrical usage – when paired with appropriately sized battery storage – especially for the all-electric case. A full compliance credit for PV sizing with ESS would provide an attractive option for building all-electric homes in this code cycle without negating the option for mixed-fuel homes, and many of those homes could reach true ZNE in this code cycle. In addition to an "oversizing" (actually, right-sizing) allowance, there should be a higher cap on compliance credit.

B. In Section 150.1(c)14, the annual electrical usage should be a <u>minimum</u> PV system size requirement, not an "equal to" requirement.

Revise Section 150.1(c)14 as follows:

> Photovoltaic Requirements. All low-rise residential buildings shall have a photovoltaic (PV) system meeting the minimum qualification requirements as specified in Joint Appendix JA11, with <u>minimum</u> annual electrical output equal to the dwelling's annual electrical usage as determined by Equation 150.1-C:

PV panels have a discrete amount of electrical output for each panel, so the minimum possible size to satisfy this requirement would be the next whole panel or module that satisfies the annual electrical usage, which is likely to be slightly larger than the dwelling's annual electrical usage.

C. We recommend the following change to Section 150.1(c)14, Exception 4:

EXCEPTION 4 to Section 150.1(c)14: In all climate zones, for low-rise residential dwellings with three habitable stories and single family dwellings with three or more habitable stories, the <u>minimum</u> PV size shall be the smaller of a size that can be accommodated by the minimum solar zone area specified in Section 110.10(b) or a PV size required by the Equation 150.1-C, but no less than 0.8 Watt DC per square foot of conditioned floor area.

Again, adding the word "minimum" will allow a system size with the next whole panel.

D. We recommend complete strike-out of Exception 6 of Section 150.1(c)14.

~~EXCEPTION 6 to Section 150.1(c)14: PV sizes from Equation 150.1-C may be reduced by 25 percent if installed in conjunction with an battery storage system. The battery storage system shall meet the qualification requirements specified in Joint Appendix JA12 and have a minimum capacity of 8 kWh.~~

We understand that the performance approach using CBECC-Res allows "oversizing" of PV systems by a factor of 1.6 when battery storage is included in the compliance model. Assuming this oversizing is acceptable for interconnection, favorable results are seen in compliance models. It seems

counterintuitive that adding battery storage would concurrently allow reduction of PV system size under 150.1(c)14 and increase of PV system size under the performance approach using CBECC. We are concerned this mixed message might lead to confusion as written. We believe Exception 6 would not be used – or worse – could be applied inappropriately. When PV system size becomes very small, the cost-effectiveness suffers because fixed cost of the PV system is spread over a smaller annual kWh output. The allowance for system size reduction is not necessary and would only serve to reduce the cost-effectiveness of the PV system. We are concerned that consultants might inappropriately reduce specified minimum PV system size, believing they are saving their client money, and that this exception would cause confusion.

E. SEIA and CALSSA recommend the following revision, to augment our previous comments of our letter to the Commission of October 20, 2017 in which we stressed the importance of any monitoring should be done at the system level. As such, we submit the following proposed language revision:

JA11.5 System Monitoring Requirements

JA11.5.1 Remote Monitoring Capability
The PV system shall have a web based portal and a mobile device application that at a minimum provide the dwelling occupants access to the following information ***for the entire PV system***:

(a) The nominal kW rating~~. the PV system.~~
(b) Number of PV modules and the nominal watt rating of each module.
(c) Hourly (or 15 minute interval), daily, monthly, and annual kWh production in numeric and graphic formats.
(d) Running total of daily kWh production.
(e) Daily kW peak power production.
(f) Current kW production~~. of the entire PV system~~.

F. SEIA and CALSSA supports the incorporation of system verification with existing inspections as carried out by the respective building departments.

~~SEIA and CALSSA are aware of several public comments submitted to the docket related to HERS verification of PV systems.~~ We appreciate the contribution of HERS verification in California's New Solar Home Partnership (NSHP) and how, at the time, solar was considered more complex and exhibited more variability in system design and installation. Currently, and as we move into the future, we find that with the implementation and enforcement of PV as a Mandatory Measure, PV systems have and will continue to become more simplified, ubiquitous and familiar such that electrical and building inspectors have increased their knowledge and experience with solar PV to perform the required inspection/verification as part of their normal inspection and permitting process.

The *California Solar Permitting Guidebook,* as developed by the Governor's Office of Planning and Research (OPR), acknowledges as its fundamental premise the fact that residential PV systems under 10 kW capacity are very uniform and very repetitive.

> "Solar energy systems have been installed in California for decades, and their technology, as well as the methods to install and maintain them, is well established. As a result, permitting for these small and simple solar projects should be as simple and standardized as possible."

Further, California *Assembly Bill 2188* states:

> "It is the intent of the Legislature that local agencies comply not only with the language of this section, but also the legislative intent to encourage the installations of solar energy systems by removing obstacles to, and minimizing costs of, permitting such systems."

We believe implementation of the standards by compliance modeling and enforcement of the standards by local enforcement agencies – as well as other quality and performance checks already in place – are adequate to ensure the safety and performance of PV systems.

Safety inspections are performed by the city/county inspector. Training for building department and fire safety personnel is readily available. The Interstate Renewable Energy Council (IREC) hosts PV online training. With funding from the DOE SunShot Initiative, and in partnership with the International Association of Electrical Inspectors (IAEI), IREC has developed the Solar Training and Education for Professionals (STEP) program, with a target of training 100,000 individuals. This program is well under way.

The Certificate of Compliance will list characteristics of the PV system that are easily verifiable. In Joint Appendix JA11, Section JA11.5.1 requires Remote [Performance] Monitoring Capability. Many PV systems include performance guarantees – often with a minimum 20-year term – especially systems with 3rd party financing. Additional inspections are often performed by 3rd party Independent Engineers when large groups of residential projects are financed. Companies installing PV systems will have adequate motive and methods for ensuring performance.

Fall protection is a very serious concern for any rooftop operations. OSHA and CalOSHA have strict standards for fall prevention and fall arrest systems. Many solar installers have a zero-tolerance policy for rooftop fall protection for PV system installers. Many building inspectors choose to perform their visual inspection of PV systems from the ground or from ladders, and choose to *not* go up on residential rooftops. Solar companies are unlikely to accept the liability of allowing HERS raters to use their roof anchors, and it is unlikely HERS raters will install their own fall protection anchors. Further, each trip up on the roof includes additional risk of breaking roof tiles.

Reducing permitting soft cost – and reducing barriers to rapid deployment are stated goals of our Governor's Office and our state Legislature. These reduced costs will also continue to incentivize more individuals, businesses and organizations to invest in solar accordingly and contribute to the State's green goals.

G. We recommend the following revision for Joint Appendix JA11, Section JA11.8

JA11.8 Enforcement Agency The local enforcement agency shall verify that all Certificate of Installations are valid and that the PV systems meet all provisions of JA11. ~~For verification of the minimal shading criterion in JA11.3.1, the local enforcement agency shall verify the array physically or use an online satellite mapping tool approved by the Executive Director to evaluate the solar access availability of the building location.~~

The AHJ will inspect for safety. We believe it is unrealistic to expect building department staff to use an online satellite mapping tool.

H. Appendix JA 12: Subchapter 2 – Demand Management Requirement

SEIA and CALSSA would like to re-emphasize our previous comments on Demand Management from our letter of February 21, 2018; we appreciate the updated revisions from the Commission and the opportunity to continue collaboration on improving the language.

Section 110.12 describes the mandatory requirement for demand management systems. We encourage the Commission to make this section's requirement flexible in communications standard implementation.

III. SUPPLEMENTAL COMMENTS ON SOLAR THERMAL

A. CALSSA recommends eliminating the proposed Exception in Section 140.5(b) PRESCRIPTIVE REQUIREMENTS FOR SERVICE WATER HEATING SYSTEMS.

CALSSA opposes the proposed Exception added to Section 140.5(b) which allows buildings eight stories or greater to avoid the solar water heating requirement for residential occupancies. Current code does not have this exception, and developers have proven to be fully capable of achieving the solar fraction goals required on buildings much taller than the eight story limit. Solar installations on high-rise buildings are often less expensive than on mid-rise buildings because the service water heating equipment is typically located at the

roof penthouse level, which reduces solar system piping and installation costs.

CALSSA believes the proposed exception should be eliminated. However if a genuine concern still remains for high-rise buildings achieving the required solar fraction, we recommend raising the level from eight stories to forty stories. Above forty stories, the amount of available space begins to become constrained.

B. CALSSA recommends adding a solar/electric water heater option to Section 150.1 (c)8A.

CALSSA recommends including a provision for solar water heating in conjunction with electric resistance water heating in Section 150.1(c)8A. A 70% solar fraction water heating system with electric resistance backup uses approximately the same or less energy than the heat pump water heating options allowed. CALSSA suggests the following language:

> (v) A solar water heating system meeting the installation criteria specified in Reference Residential Appendix RA4 using an electric resistance backup water heater with a minimum solar savings fraction of 70%. In addition one of the following:
> a. For climate zones 2 through 15 a photovoltaic system capacity of .3 kWdc larger than the minimum required specified in Section 150.1(c)4; or
> b. For climate zones 1 and 16, a photovoltaic system capacity of 1.1 kWdc larger than the requirement specified in Section 150.1(c)4

C. CALSSA recommends making a change to Section 150.0(j)2

CALSSA supports the minimum insulation requirement for piping associated with the transfer of heat from storage into a building's conventional heating system. However, a number of industry participants involved in larger system installations in various locations around the US specify a minimum R 4 insulation. Accordingly, we recommend a separate subsection for solar water heating system collector loops, consistent with CSI Thermal requirements, and removed from the subsection that includes piping for space conditioning systems and steam & hydronic heating systems.

Therefore, we recommend the following changes in Section 150.0(j)2:

~~B. In addition to insulation requirements, all domestic hot water pipes that are buried below grade must be installed in a water proof and no-crushable casing or sleeve.~~

B. Solar water-heating system collector loop piping shall have minimum R 4 insulation.

~~B.~~C. Piping for space conditioning systems~~, solar water-heating system collector loop,~~ and distribution piping for steam and hydronic heating systems, shall meet the requirements of Section 120.3(c).

D. SEIA and CALSSA recommend a change to section 150.1(c)8Biii requirements for solar water heating systems.

As noted in our earlier comments filed on February 20, 2018, SEIA and CALSSA disagree with the provision in Subchapter 8 that makes a change to Section 150.1(c)8Biii for multiple dwelling units that would downsize the solar water heating system if a drain water heat recovery system were installed. We recommend retaining the original language in Section 150.1(c)8Biii, and not adding new paragraphs to this section for drain water heat recovery. Section 150.1(c)8Biii would again read:

> iii. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum solar savings fraction of either a or b below of 0.20 in Climate Zones 1 through 9 or a minimum solar savings fraction of 0.35 in Climate Zones 10 through 16. The solar savings fraction shall be determined using a calculation method approved by the Commission.

IV. ZNE, SOLAR & STORAGE

Both SEIA AND CALSSA ardently support that the 2019 standards should take California all the way to Zero Net Energy for new homes - as has been the goal for almost a decade - and simultaneously maximize developers' options on how to achieve the most cost-effective energy reductions to meet the CEC's goals.

As stated in our previous comments, SEIA and CALSSA encourage the Commission to carry through all the way to ZNE goals with the 2019 development cycle so as to maximize the benefits of bringing solar and other renewable energy into the power portfolio of California.

V. CONCLUSION

SEIA and CALSSA would like to thank the Energy Commission staff on their continued effort to ensure the 2019 Title 24 moves California toward meeting the 2020 ZNE goal and allows builders the flexibility to utilize the best fit combination of energy efficiency and renewable energy measures under the performance pathway.

Solar and storage have a critical role to play in the building standards compliance going forward and must therefore be valued accordingly with the compliance pathways. We look forward to continuing to provide input to staff as the final 2019 code is developed.

Sincerely,

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