

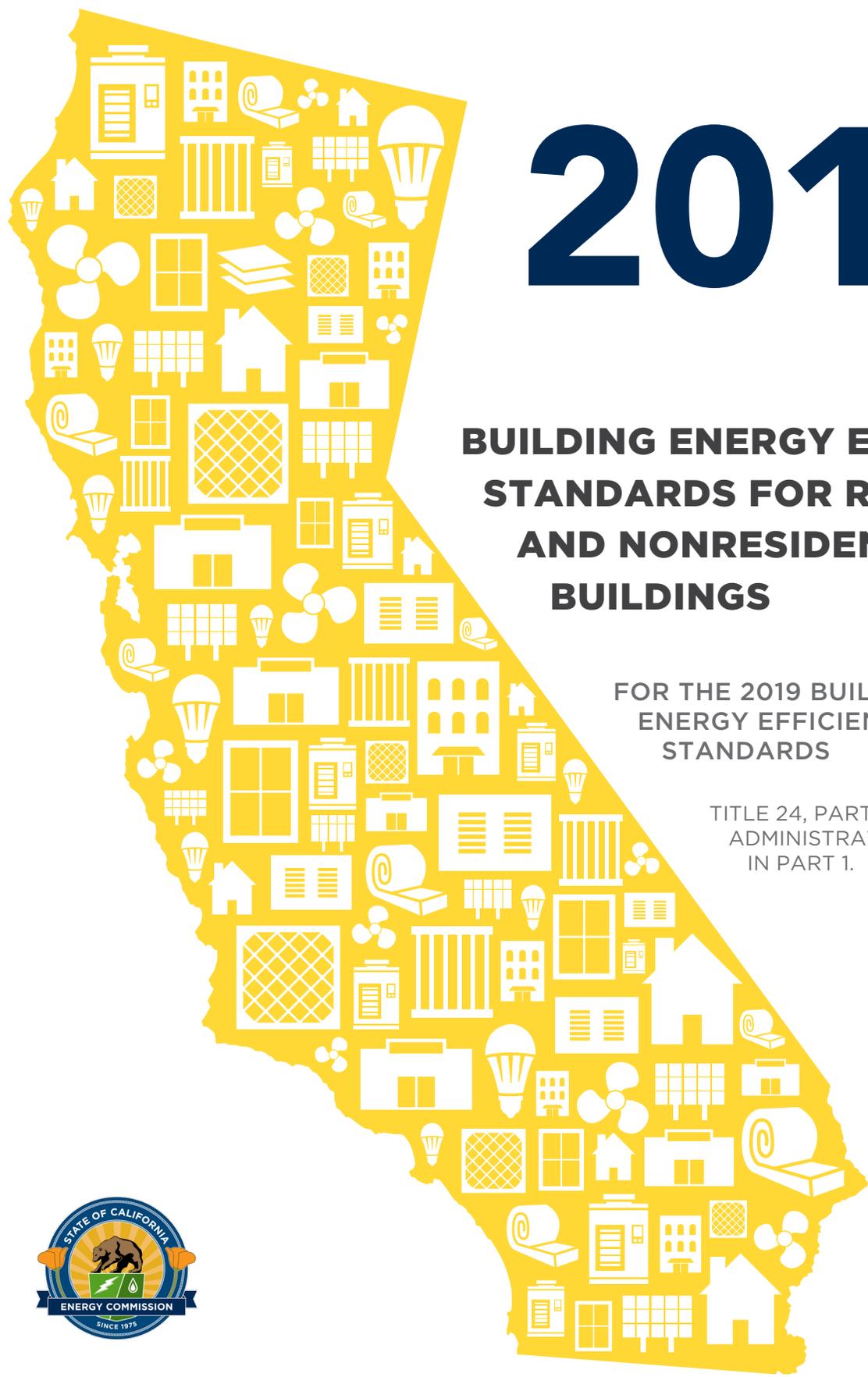
Docket No.: R.20-08-020

Exhibit No.: SVS - 11

SEIA / VOTE SOLAR CROSS EXAMINATION EXHIBIT

**2019 BUILDING ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND
NONRESIDENTIAL BUILDINGs**

(select pages)



2019

BUILDING ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

FOR THE 2019 BUILDING
ENERGY EFFICIENCY
STANDARDS

TITLE 24, PART 6, AND ASSOCIATED
ADMINISTRATIVE REGULATIONS
IN PART 1.



DECEMBER 2018
CEC-400-2018-020-CMF

CALIFORNIA ENERGY COMMISSION
Edmund G. Brown Jr., Governor

11. **Roofing products.** All roofing products shall meet the requirements of Section 110.8 and the applicable requirements of Subsection A or B:
- A. Low-rise residential buildings with steep-sloped roofs, in Climate Zones 10 through 15 shall have a minimum aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75, or a minimum SRI of 16.
 - B. Low-rise residential buildings with low-sloped roofs; in Climate Zones 13 and 15 shall have a minimum aged solar reflectance of 0.63 and a minimum thermal emittance of 0.75 or a minimum SRI of 75.
- EXCEPTION 1 to Section 150.1(c)11:** Building integrated photovoltaic panels and building integrated solar thermal panels are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.
- EXCEPTION 2 to Section 150.1(c)11:** Roof constructions with a weight of at least 25 lb/ft² are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.
12. **Ventilation Cooling.** Single family homes shall comply with the Whole-house fan (WHF) requirements shown in TABLE 150.1-A. When a WHF is required, comply with Subsections A. through C. below:
- A. Have installed one or more WHFs whose total Airflow CFM is equal to or greater than 1.5 CFM/ft² of conditioned floor area. Airflow CFM for WHF's shall be determined based on the Airflow listed in the Energy Commission's database of certified appliances, which is available at www.energy.ca.gov/appliances/database; and
 - B. Have at least 1 square foot of attic vent free area for each 750 CFM of rated whole-house fan Airflow CFM, or if the manufacturer has specified a greater free vent area, the manufacturers' free vent area specifications; and
- EXCEPTION to Section 150.1(c)12B:** WHFs that are directly vented to the outside.
- C. Provide homeowners who have WHFs with a one page "How to operate your whole-house fan" informational sheet.
13. **HVAC System Bypass Ducts.** Bypass ducts that deliver conditioned supply air directly to the space conditioning system return duct airflow shall not be used.
14. **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 annual electrical output equal to or greater than the dwelling's annual electrical usage as determined by Equation 150.1-C:

EQUATION 150.1-C ANNUAL PHOTOVOLTAIC ELECTRICAL OUTPUT

$$kW_{PV} = (CFA \times A)/1000 + (ND_{well} \times B)$$

WHERE:

kW_{PV} = kWdc size of the PV system

CFA = Conditioned floor area

ND_{well} = Number of dwelling units

A = Adjustment factor from Table 150.1-C

B = Dwelling adjustment factor from Table 150.1-C

EXCEPTION 1 to Section 150.1(c)14: No PV system is required if the effective annual solar access is restricted to less than 80 contiguous square feet by shading from existing permanent natural or manmade barriers external to the dwelling, including but not limited to trees, hills, and adjacent structures. The

effective annual solar access shall be 70 percent or greater of the output of an unshaded PV array on an annual basis.

EXCEPTION 2 to Section 150.1(c)14: In climate zone 15, the PV system size shall be the smaller of a size that can be accommodated by the effective annual solar access or a PV system size required by the Equation 150.1-C, but no less than 1.5 Watt DC per square foot of conditioned floor area.

EXCEPTION 3 to Section 150.1(c)14: In all climate zones, for dwelling units with two habitable stories, the PV system size shall be the smaller of a size that can be accommodated by the effective annual solar access or a PV system size required by the Equation 150.1-C, but no less than 1.0 Watt DC per square foot of conditioned floor area

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 PV system size shall be the smaller of a size that can be accommodated by the effective annual solar access or the PV system size required by the Equation 150.1-C, but no less than 0.8 Watt DC per square foot of conditioned floor area.

EXCEPTION 5 to Section 150.1(c)14: For a dwelling unit plan that is approved by the planning department prior to January 1, 2020 with available solar ready zone between 80 and 200 square feet, the PV system size is limited to the lesser of the size that can be accommodated by the effective annual solar access or the size that is required by the Equation 150.1-C.

EXCEPTION 6 to Section 150.1(c)14: PV system sizes from Equation 150.1-C may be reduced by 25 percent if installed in conjunction with a battery storage system. The battery storage system shall meet the qualification requirements specified in Joint Appendix JA12 and have a minimum capacity of 7.5 kWh.

(k) Photovoltaic System Requirement Determinations.

The Commission may, upon written application or its own motion, determine that the photovoltaic requirements in Section 150.1(c)14 shall not apply, if the Commission finds that the implementation of public agency rules regarding utility system costs and revenue requirements, compensation for customer-owned generation, or interconnection fees, causes the Commission's cost effectiveness conclusions, made pursuant to Public Resources Code 25402(b)(3), to not hold for particular buildings.

Applications shall include full information regarding the differences between public agency rules and Energy Commission cost effectiveness determinations, including all information requested by the Commission to enable full review of the application. Applications shall also include specific recommended limitations to the scope of the determination that is requested, and specific eligibility criteria to determine what buildings would qualify for the determination. Applications from public agencies shall be submitted to the Energy Commission only after public review within the jurisdiction of the public entity or service area of the utility.

NOTE: Authority: Sections 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8, 25605, 25910, and 25943, Public Resources Code.