

# ➤ Single-family and Low-rise Multifamily Solar and Battery



## What Are Single-family and Low-rise Multifamily Solar System and Battery and Solar Readiness Requirements?

The 2025 California Building Energy Efficiency Standards (Energy Code or [Title 24, Part 6](#)) include requirements for installed photovoltaic (PV) systems, solar readiness, and battery energy storage systems (BESS).

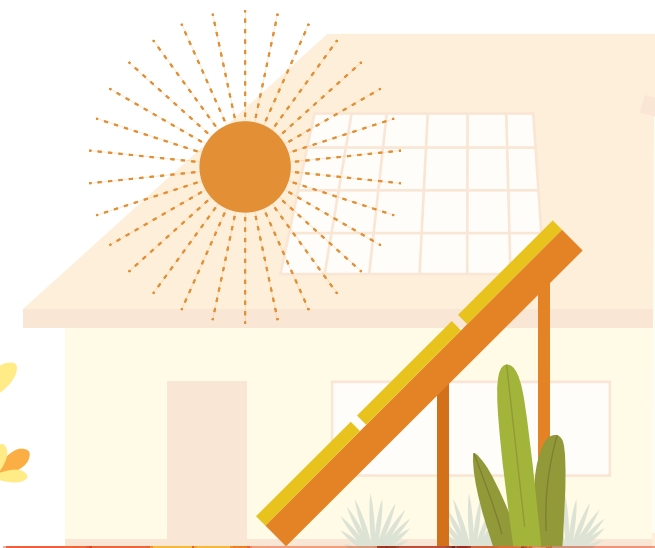
The information in this fact sheet applies to newly constructed single-family and low-rise multifamily buildings. Single-family residences of any number of stories or multifamily buildings with three or fewer habitable stories are required to meet these requirements. For definitions and examples of the occupancies and buildings included, see page 3. The PV and BESS readiness requirements do not apply to Additions nor Alterations.

- ✦ **PV system** requirements apply to newly constructed single-family buildings and to newly constructed multifamily buildings with three or fewer habitable stories.
- ✦ **BESS readiness** requirements apply only to newly constructed single-family buildings with one or two dwelling units. The BESS readiness requirements are not applicable to townhome buildings with three or more dwelling units nor low-rise multifamily buildings. Installation of a BESS is not required for single-family buildings, whereas BESS readiness will apply if no BESS is voluntarily installed. However, there is an optional Performance Approach credit available for projects that install one; if the “credit” is taken, the BESS must be installed meeting or exceeding the minimum criteria described in the Performance Approach compliance form.

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- ✦ **Solar readiness** requirements apply when PV systems are not installed in newly constructed single-family homes in subdivisions with 10 or more residences and newly constructed multifamily buildings with three or fewer habitable stories or additions that add more than 2,000 ft<sup>2</sup> of roof.

## Importance of Compliance

Solar electricity from residential PV systems is part of meeting California's climate goals. California is aiming to reduce its greenhouse gas (GHG) emissions while creating an energy system that is resilient to climate risks, spurring innovation and a low-carbon transition nationally and internationally. California met its 2020 target four years early in 2016, and emissions have continued to drop since then. California's next climate targets are to reduce emissions by 40% below 1990 levels by 2030 and by 80% below 1990 levels by 2050.

BESS should be considered since they help to keep the electricity levels in the grid stable and balanced by storing mid-day solar electricity that would otherwise be exported to the grid when it is of lesser value. The BESS can then be used to supply or supplement on-site consumption in-lieu of drawing from the electric grid during peak grid periods, when marginal grid electricity is often drawn from more expensive fossil fuel plants with higher emissions. For more information, read the [Designing Single-family Homes to Run on Clean Energy Fact Sheet](#).



For information on solar system and BESS requirements that apply to nonresidential buildings and multifamily buildings with four or more habitable stories, see the 2025 Nonresidential and High-rise Multifamily Solar and Battery Systems Fact Sheet.

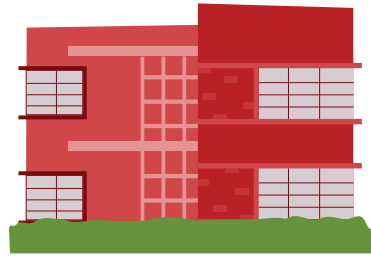


# Occupancies Subject to Residential Solar-readiness Requirements

The requirements in this fact sheet apply to single-family buildings, duplexes, and town homes. They also apply to low-rise multifamily buildings (multifamily buildings with less than three habitable stories).



Single-family



Multifamily

## Multifamily Groups

Referred to as “Multifamily Building” in the Energy Code

**Occupancy Class: R2 — Residential**

Buildings with three or more dwelling units for permanent residents.

**Occupancy Class: R3 — Residential**

Multifamily congregate residences with primarily permanent residents. This can include Accessory Dwelling Units (ADUs) on a multifamily property.

**Occupancy Class: R4 — Residential**

Supervised residential environments for more than six ambulatory clients and up to 16 total residents, that is not considered a “Healthcare Facility.”

**Occupancy Class: U — Miscellaneous**

Accessory buildings and structures, and miscellaneous structures not classified in any specific occupancy and on a multifamily property.

## Single-family Groups

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**Occupancy Class: U — Miscellaneous**

Accessory buildings and structures, and miscellaneous structures not classified in any specific occupancy and on a multifamily property.

The following occupancy is *not* subject to the Energy Code.

## Nonresidential Groups

**Occupancy Class: C — Camps**

An organized camp is a site with programs and facilities established for the primary purpose of providing an outdoor group living experience with social, spiritual, educational, or recreational objectives, for five days or more during one or more seasons of the year.

# Battery Energy Storage System Components and Key Terms

**Battery Energy Storage System (BESS):** Stationary equipment that receives electrical energy and then utilizes batteries to store that energy for later use. The BESS consists of one or more modules, a power conditioning system, and a balance of plant components.

**BESS-ready Interconnection Equipment:** Equipment, including but not limited to, a BESS-ready panelboard or switchboard that can accommodate the connection of a distributed energy resource or a BESS capable of either automatic or manual isolation from the utility power source.

**BESS-ready Panelboard/Switchboard:** A panelboard or switchboard that can accommodate either automatic or manual switching between a utility power source to a distributed energy resource or a battery energy storage system, such as a split bus panelboard or switchboard.

**Busbar Rating:** The electrical current that an electrical panel busbar can carry, with battery energy storage system readiness requiring that the main electrical service panel have a minimum busbar rating of 225 amps.

**Note:** This does not mean that the load rating of service from the load-serving entity (e.g., utility) must be 225 amps.

**Community-shared Solar Electric Generation System or Battery Energy Storage System Offset:** Solar electric generation or other renewable electric generation technology and/or battery energy storage systems that are installed at a location outside of the project site and for compliance with the 2025 Energy Code, meet the qualifications of [§10-115](#), and be approved by the CEC.

**Inverter:** Component in a PV system that converts direct current (DC) to alternating current (AC) and has the capability to connect the system to the grid through the utility service.

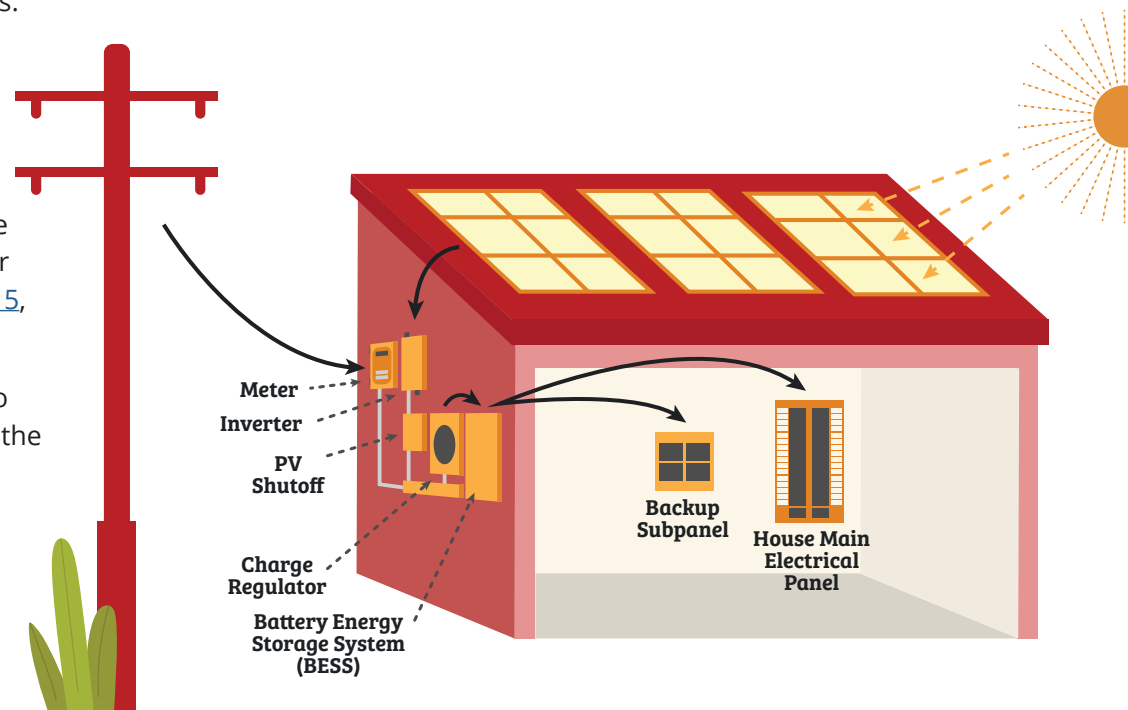
**Newly Constructed Building:** A building that has never been occupied for any purpose.

**Photovoltaic (PV) System:** A system to generate electricity from solar energy that includes PV panels and may include inverters and other interconnection equipment to the building's electrical system.

**Raceway:** An enclosed conduit that provides a physical pathway for electrical wiring, required in solar readiness to extend from the main electrical panel to a specified distance from the location of future electric equipment.

**Solar Access Roof Area (SARA):** The area of the building's roof space that is capable of structurally supporting a PV system, the area of all roof space on covered parking areas, carports, and all other newly constructed structures on the site that are compatible with supporting a PV system (For exceptions, see the SARA section later in this fact sheet).

**Solar Assessment:** Verification and documentation of the shading conditions for a PV system as specified in Joint Reference Appendix JA11.4 and completed using a CEC- approved solar assessment tool listed on their website.



# Photovoltaic Systems

## Photovoltaic System Sizing and Installation Sizing and Installation Sections [150.1\(c\)14](#) and [170.2\(f\)](#)



### Prescriptive Requirement

Prescriptive Requirement for which the **Performance Approach** can be used for flexibility of these requirements.

**Table 1: When Does a Project Need to Consider PV per the Energy Code?**

Project Scope	PV Requirements
Newly constructed single-family or low-rise multifamily building (this includes buildings that do not include dwelling units such as a stand-alone pool house or workshops)	YES
Newly constructed single-family building in a subdivision of 10 or more homes that is eligible for a PV exception	No Solar Readiness <i>will</i> apply
Newly constructed low-rise multifamily building that is eligible for a PV exception	No Solar Readiness <i>may</i> apply
Adding onto an existing single-family building	No
Adding onto an existing low-rise multifamily building	No Solar Readiness <i>may</i> apply if the addition includes more than 2,000 ft <sup>2</sup> of new roof area
Altering an existing building	No
Altering an existing PV system	No

A solar electric generation system, or PV system, is the complete set of all components for converting sunlight into electricity through the photovoltaic process, including the array of panels, inverter(s), and the balance of system components required to enable the system to effectively deliver power to reduce a building’s consumption of electricity from the utility grid.

### Fire Code Requirements

PV systems must meet Fire Code requirements of California Residential Code (CRC) Sections R324.3 and R324.7 and Section 1205 of the California Fire Code (CFC).

## Required PV System Size

Projects in the applicable project scopes that do not qualify for an exception (see exceptions on page 11) must have a minimum PV system of a size determined using either the Prescriptive or Performance Approach.



### Prescriptive Requirement

The Energy Code has two Prescriptive pathways for PV sizing, from which the LESSER of the two is the applicable Prescriptive size:

- ★ **CFA Method:** Prescriptive Sizing based on Conditioned Floor Area (CFA) and number of Dwelling Units (DU)

In this method, the Prescriptive sizing is based on the conditioned floor area and the number of dwelling units. These inputs are combined with climate zone-specific factors to produce a minimum PV kW capacity.

- ★ **SARA Method:** Prescriptive Sizing based on Solar Access Roof Area (SARA)

This method is commonly used for projects with roof areas that are substantially shaded or otherwise limited surface area due to building geometry. Once the SARA is determined, it is multiplied by a factor based on roof slope:

- » **Steep sloped** roof areas ft<sup>2</sup> (pitch greater than or equal to 2:12) is multiplied by 18 watts
- » **Low-slope** roof area ft<sup>2</sup> (less than 2:12 pitch) is multiplied by 14 watts



### Performance Requirement

In the Performance Approach, the sizing for PV in both single-family and multifamily projects is input by the user into [Performance Approach software](#), which can be found on [energy.ca.gov](http://energy.ca.gov).

The Standard Design (of which the proposed design is compared to) is determined by the lesser PV kWdc size of the CFA Method and SARA Method. The required minimum PV system size is indicated in the Certificate of Compliance forms (CF1R for single-family or LMCC for low-rise multifamily).

## Method 1CFA Approach ([Equation 150.1-C](#) / [Equation 170.2-C](#))

$$\text{DC Rating} = (\text{CFA} \times \text{A}) / 1000 + (\text{N}_{\text{DU}} \times \text{B})$$

### WHERE:

**DC Rating** = kW<sub>DC</sub> size of the PV system

**CFA** = Conditioned floor area

**N<sub>DU</sub>** = Number of dwelling units

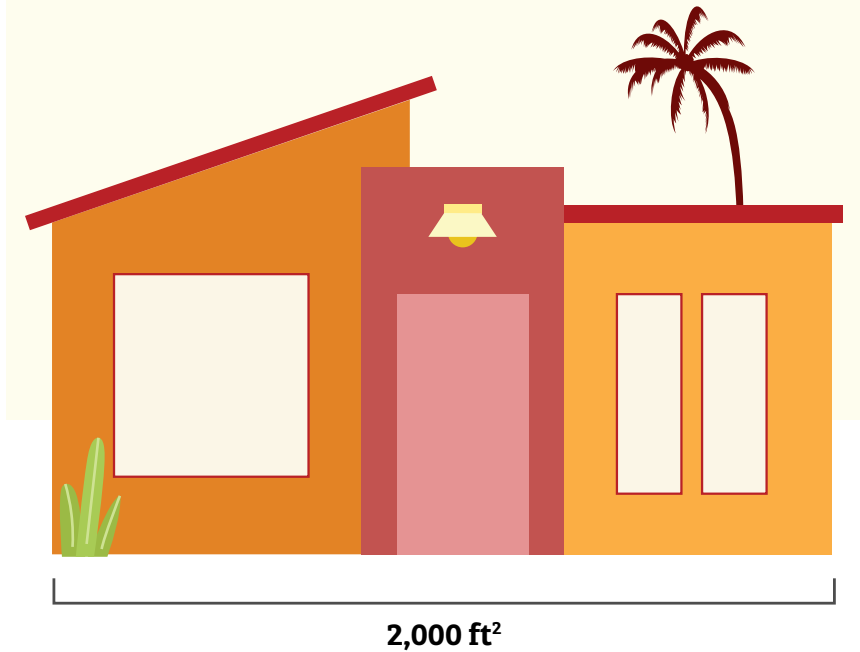
**A** = CFA adjustment factor from table below

**B** = Dwelling unit adjustment factor from table below

**Table 150.1-C and 170.2-T**

Climate Zone	A - CFA	B - Dwelling Units
1	0.793	1.27
2	0.621	1.22
3	0.628	1.12
4	0.586	1.21
5	0.585	1.06
6	0.594	1.23
7	0.572	1.15
8	0.586	1.37
9	0.613	1.36
10	0.627	1.41
11	0.836	1.44
12	0.613	1.40
13	0.894	1.51
14	0.741	1.26
15	1.56	1.47
16	0.59	1.22

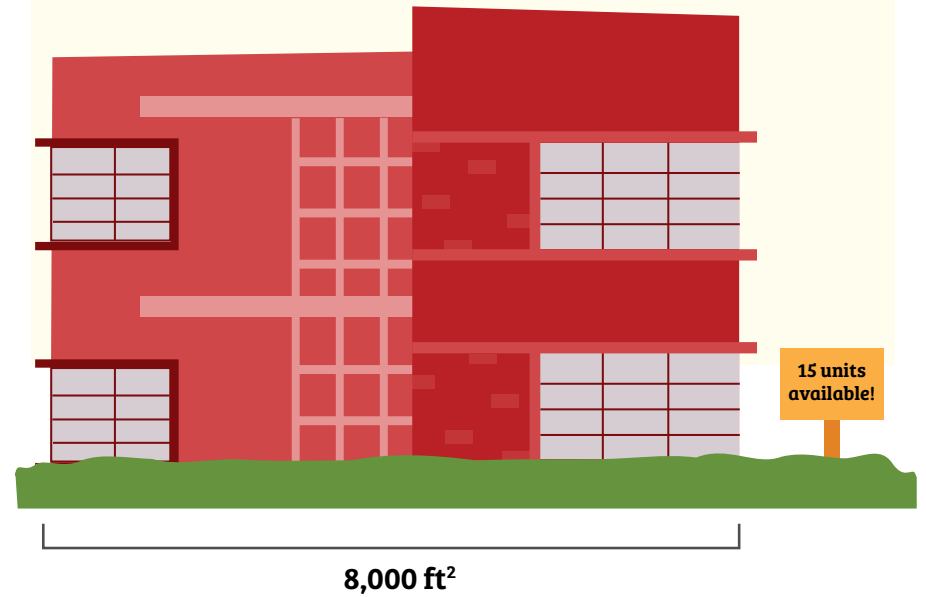
### Example 1



A 2,000 ft<sup>2</sup> single-family home in San Bernardino (Climate Zone 10) using Prescriptive CFA Method 1 Equation 150.1-C:

$$(2,000 \text{ ft}^2 \times 0.627)/1,000 + (1 \text{ dwelling unit} \times 1.41) = 2.664 \text{ kW}_{\text{dc}}$$

### Example 2



An 8,000 ft<sup>2</sup> (conditioned floor area) 2-story multifamily building with 15 dwelling units in Rocklin (Climate Zone 11) using Prescriptive CFA Method 1 Equation 170.2-D:

$$(8,000 \text{ ft}^2 \times 0.836)/1,000 + (15 \text{ dwelling units} \times 1.44) = 28.3 \text{ kW}_{\text{dc}}$$

## Solar Access Roof Area

### › [Sections 150.1\(c\)14A-B](#) and [170.2\(f\)A-B](#)

The **solar access roof area (SARA)** defines how much of the roof area is both capable of supporting a PV system and has sufficient annual solar exposure to generate energy. The SARA calculations allow for exclusion of certain areas of the roof that are excessively shaded or must otherwise be clear to serve another code-designated purpose (e.g., occupied roof deck and fire access clearances).

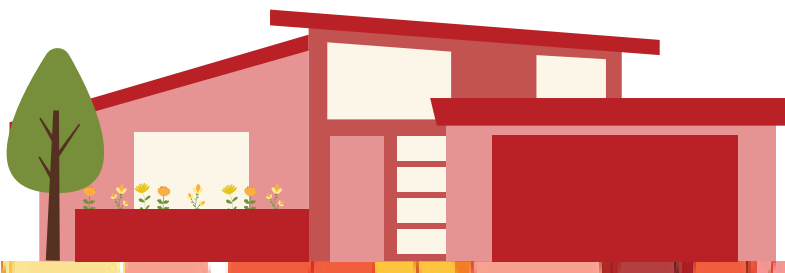
For single-family buildings and multifamily buildings of three or fewer habitable stories, the Energy Code description of SARA is provided:

#### SARA includes:

- ✦ The area of the building's roof space capable of structurally supporting a PV system
- ✦ The area of all roof space on covered parking areas, carports, and all other newly constructed structures on the site that are compatible with supporting a PV system

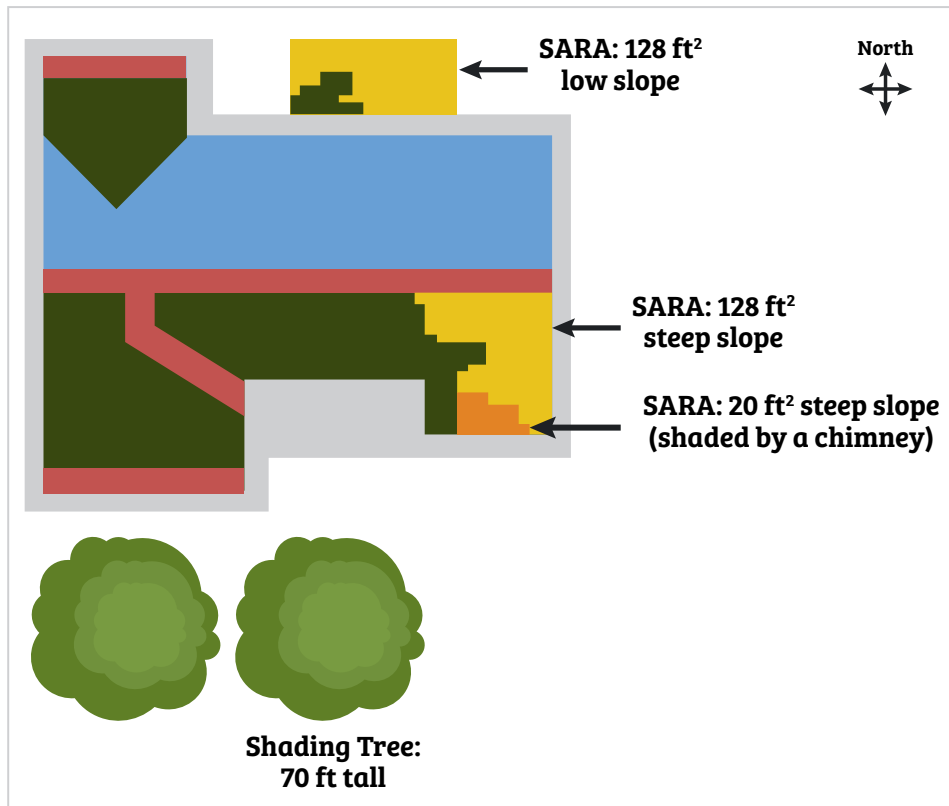
#### SARA does *not* include:

- ✦ **North facing roofs:** Any steep-sloped roof area facing between 300 degrees and 90 degrees from true North.
- ✦ **Excessively shaded roof areas:** Any roof area that has less than 70% annual solar access: Annual solar access is determined by dividing the total annual solar insolation, accounting for shading obstructions, by the total annual solar insolation if the same areas were unshaded by obstructions.
  - » **For steep-sloped roofs,** only shading from existing permanent natural or manmade obstructions that are external to the dwelling (such as trees, hills, and adjacent structures) are considered when determining SARA. If shading on roof results from building features that are a part of that building (e.g. chimneys, plumbing vents, or building massing) then those areas will count towards SARA.
  - » **For low-sloped roofs,** all obstructions including those that are external to the dwelling unit and obstructions that are part of the building design and elevation features are considered when determining SARA. This means that low-sloped roof areas that are excessively shaded due to building features (such as chimneys and plumbing vent stacks) are excluded from SARA.
- ✦ **Occupied roof areas** as specified by California Building Code §503.1.4.
- ✦ **Roof area not available** due to compliance with other building code requirements (examples include clearances for mechanical access, setbacks and pathways for fire code and equipment clearances for exterior building maintenance).
- ✦ **Local ordinances** that would preclude PV being used in certain areas, if the ordinance is confirmed by the CEC Executive Director.



## Single Family Example

Below is an overhead view of the roof of a single-family home, showing an example of areas that are included and excluded from the SARA calculation.



**Table 150.1-C and 170.2-T**

Description	Slope	SARA (sq. ft.)	W/sq. ft.	Calculated kW
Patio Roof	Low	128	14	1.8
South Roof ≥ 70% solar access	Steep	128	18	2.3
South Roof < 70% solar access, shaded by chimney*	Steep	20	18	0.4

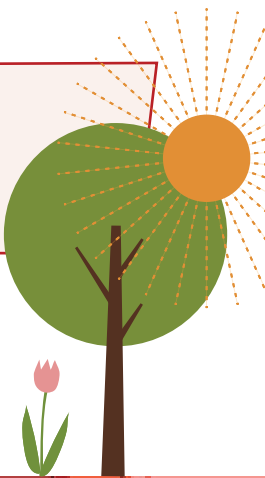
**Total kW = 4.5**

\*Area shaded by chimney is included as it is a steep-slope roof and the chimney is part of the building's design.

- Key:**
- Fire Pathways
  - < 70% annual solar access
  - Steep slope roof facing North
  - ≥ 70% Solar access
  - < 70% annual solar access but counted into SARA
  - Overhangs not structurally capable of PV

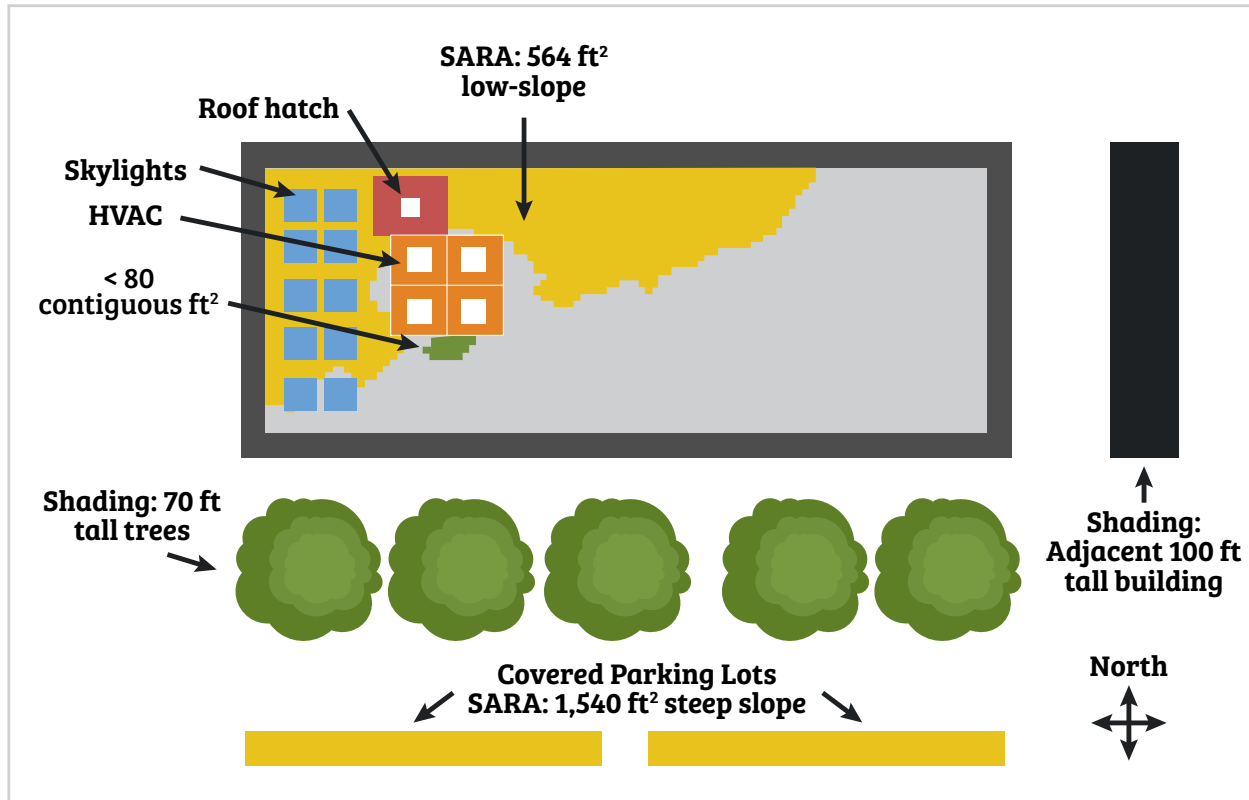
### Solar Assessment Tools

A list of CEC-approved solar assessment tools is available at [bit.ly/CEC-Solar-Assessment-Tools](https://bit.ly/CEC-Solar-Assessment-Tools)



## Low-rise Multifamily Example

Below is a newly constructed two-story multifamily building that has a low-sloped roof area of 6,000 ft<sup>2</sup> and steep-sloped covered parking structures of 1,600 ft<sup>2</sup> of which there are shading considerations from nearby buildings, trees, design features, and obstructions. The required PV is calculated in the table to the right using the SARA Method.



**Areas Excluded from SARA:**

- Perimeter setback
- Pathway around roof hatch
- < 80 contiguous ft<sup>2</sup> (included in SARA)
- < 70% annual solar access
- Clearance around HVAC

**Table 2: Calculate the Required PV Per the SARA Method**

6,000 ft <sup>2</sup> Low-sloped Roof Areas Removed	2,000 ft <sup>2</sup> Steep-sloped Roofs Areas Removed
<b>Minus 1,600 ft<sup>2</sup></b> 5 ft high parapets on all sides (shading)	N/A
<b>Minus 300 ft<sup>2</sup></b> 3 ft around HVAC systems + HVAC system footprint	N/A
<b>Minus 200 ft<sup>2</sup></b> Skylights and roof access	N/A
<b>Minus 2,936 ft<sup>2</sup></b> Less than 70% annual solar access	N/A
<b>Minus 400 ft<sup>2</sup></b> Clearances and pathways required for PV installation (not shown)	<b>Minus 60 ft<sup>2</sup></b> Clearances and pathways required for PV installation (not shown)
<b>564 ft<sup>2</sup> x 14 watts / 1000 = 7.9 kW</b>	<b>1,540 ft<sup>2</sup> x 18 watts / 1000 = 27.72 kW</b>

**Total kW = 7.9 kW + 27.72 kW = 35.62 kW**

## PV System Exceptions

- ✦ **Limited SARA:** No PV system is required if the SARA is less than 80 contiguous ft<sup>2</sup>
- ✦ **Small PV size:** No PV system is required if using either Prescriptive approach (SARA or CFA), the minimum PV system capacity requirement is:
  - » **Single-Family:** Less than 1.8 kWdc
  - » **Low-rise Multifamily:** Less than 4 kWdc
    - **Example 1:** A newly constructed single-family home in CZ2 with 750 sq.ft. of conditioned floor area.  $(0.621 \times 750) / 1000 + 1.22 = 1.68$  kW. The project is exempt from PV requirements since CFA method results in less than 1.8 kW.
    - **Example 2:** A low-rise multifamily building with 8 units has a SARA of 250 sq.ft on a low-sloped roof.  $250 \times 14 \text{ W/sq.ft.} = 3.5$  kW, which is less than 4 kW so the project is exempt from PV requirements.
    - **Example 3:** A newly constructed 2200 sq.ft. conditioned accessory building (not a dwelling unit) on a single-family lot is proposed in CZ13. The Prescriptive requirement is  $(2200 \times 0.836) / 1000 + 0 = 1.84$  kW. The project is **not** exempt from Prescriptive PV requirements.

- ✦ **Snow loads:** Where the Authority Having Jurisdiction (AHJ), typically the building department, has determined that the PV system cannot meet the requirements of the American Society of Civil Engineers (ASCE), Standard 7-16, Chapter 7, Snow Loads.
- ✦ **Planning approval prior to January 1, 2020:** When buildings are approved by the local planning department prior to January 1, 2020 (more common with subdivisions), with mandatory conditions for approval that impact SARA and PV layout, the restrictions can be included when determining SARA.
- ✦ **BESS installed with 7.5 kWh or greater:** Projects that choose to include BESS, meeting the requirements of JA12, sized 7.5 kWh or greater, the PV kWdc sizing can be reduced by 25% when using the Prescriptive CFA Approach and BESS that is certified to the CEC (which can be found on [solarequipment.energy.ca.gov](http://solarequipment.energy.ca.gov)) and meets the qualification requirements in Joint Reference Appendix JA12 for safety, system performance and controls, interconnection, and net energy metering.

### Roof Slope

The Energy Code defines roof slopes as follows:

- ✦ **Steep-sloped roofs** have a ratio of rise to run greater than or equal to 2:12 (9.5° from the horizontal)
- ✦ **Low-sloped roofs** have a ratio of rise to run less than 2:12 (9.5° from the horizontal)

## Photovoltaic System Qualification Requirements

If a PV system is required, it must meet the qualification requirements in Joint Reference Appendix JA11.

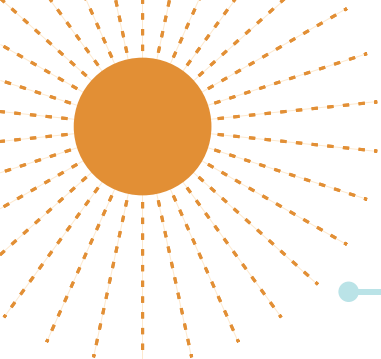
### Requirements include:

- ✦ **System orientation (JA11.2):** For the Prescriptive Approach, PV modules mounted at pitches  $\geq 2:12$  (or 10 degrees) must be oriented within 90 to 300 degrees from true north. Flat modules ( $<2:12$  pitch) can be installed at any azimuth. In the Performance Approach, any azimuth and pitch can be used for the installed modules' proposed design.
- ✦ **Performance Approach Note:** When using steep-slope pitches up to 7:12 for PV placement, there are two flexibility methods called California Flexible Installation (CFI).
- ✦ **CFI1** allows for any azimuth from 150 to 270 degrees from true north with all PV modules matching the pitch of the roof which cannot be greater than 7:12.
- ✦ **CFI2** allows for any azimuth from 105 to 300 degrees from true north with all PV modules matching the pitch of the roof which cannot be greater than 7:12. Using CFI2 will reduce the modeled kW capacity of the proposed PV system by ~9% relative to CFI1.
- ✦ PV placement outside of the above ranges cannot use CFI1 or CFI2 and must model the actual orientation(s) of the designed PV system.
- ✦ **Shading (JA11.3):** For the Prescriptive Approach, the annual solar access must be 98% or greater (shading of less than 2%). This is supported by using a CEC approved Solar Assessment Tool to determine the shading of where the PV panels will be located. This will be required to be verified out in the field using CEC approved "Solar Access Verification Tool" based on the PV installation.  
  
In the Performance Approach, the annual solar access is input according to the solar assessment study. Shading reduces PV system production.

- ✦ **System monitoring (JA11.5):** The installed PV system shall have a web-based portal and a mobile device application that provides the following:
  1. **System Characteristics:** Number of PV modules, nominal watt rating of each module, and nominal kW rating of entire PV system
  2. **Current system production:** Current kW production of the entire PV system
  3. **Historical production information:** Hourly (or 15-minute interval), daily, monthly, and annual kWh production in numeric and graphic formats. Daily kW peak power production must also be supported.
- ✦ **Interconnection (JA11.6):** Installed inverters shall be tested in accordance with the applicable requirements in UL1741 and UL1741 Supplement A. The PV system shall comply with all applicable requirements specified in California Public Utilities Commission (CPUC) Rule 21.
- ✦ **Certificates (JA11.7):** The PV installer must certify on the Certificate of Installation for Photovoltaic System that all provisions of JA11 are met and includes the solar assessment report documenting system compliance.
  - » **Single-Family:** CF2R-PVB-01-E
  - » **Low-rise Multifamily:** LMCC-SAB-01-E

### Community-shared Programs

Community-shared Solar Electric Generation System or Battery Energy Storage System Offset refers to solar electric generation or other renewable electric generation technology and/or energy storage systems (batteries) that are installed at location outside of the project site to benefit the building. To comply with the 2025 Energy Code, all systems must meet the qualifications of [§10-115](#) and be approved by the CEC.



# Determining Single Family and Multifamily ≤ 3 Stories PV System Sizing



## 1. Calculate Solar Access Roof Area (SARA).

Use SARA to determine how much PV is required and if any exceptions apply. SARA considers annual solar access for the roof of the new building plus the roof areas of other new structures on the site that can structurally support a PV system.

SARA includes roof areas with ≥ 70% annual solar access (using a CEC-approved solar shading assessment tool). SARA excludes roof areas shaded by obstructions, occupied per CBC 503.1.4, or required to remain clear because of other building code requirements.

- Low-sloped Roofs: Shading assessment includes all obstructions that shade potential PV locations.
- Steep-sloped Roofs: Shading assessment includes only obstructions that are external to the dwelling.

*\*If a local building ordinance or code limits the available roof area for PV, the local authorities must seek approval from the CEC for excluding areas from the SARA.*

What is the total SARA?

**≥80 ft<sup>2</sup> of contiguous SARA - Proceed to Step 2**  
**<80 ft<sup>2</sup> of contiguous SARA - Stop. A newly installed PV system is not required**

## 2. Choose a Compliance Approach.

### Prescriptive Approach

Minimum PV size is the smaller of the following Prescriptive options:

- Conditioned Floor Area (CFA) Method: Use Equation 150.1-C (single-family) or 170.2-C (multifamily) to calculate the kW of PV required.
- SARA Method: Using calculated SARA, calculate PV kW using 14 W/sf for low-sloped roofs and 18 W/sf for steep-sloped roofs.

### Performance Approach

Use the CEC approved compliance software to evaluate the whole building. Minimum PV size is indicated in the compliance report.

*\*Note that SARA can be used in the Performance Approach, and exceptions can be claimed in the compliance software.*



**Proceed to Step 3**  
**Determine exceptions on next page**



### 3. Determine If Any Exceptions Apply.

#### 3.1 Minimum Prescriptive Sizing Exception

Using either Prescriptive option, is the required PV kW:

< 1.8 kW for single-family?

< 4 kW for multifamily?

**Yes - Stop. A newly installed PV system is not required.**

**No - Proceed**

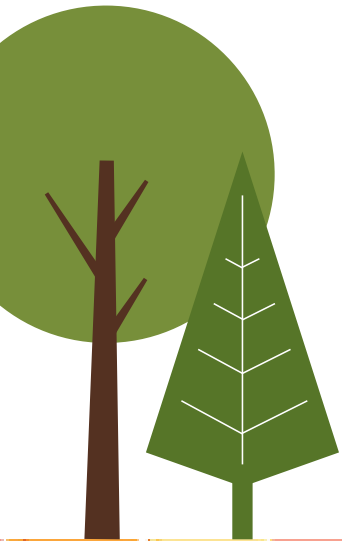
#### 3.2 Snow Load Exception

If the project location is in a snow load area, has the enforcement authority (i.e., building department) determined that it is not possible for the PV system to meet ASCE 7-16, Chapter 7, Snow Loads?

**Yes - Stop. A newly installed PV system is not required.**

**No - Install the minimum PV kW calculated in Step 2.**

**If your project is *not* required to install PV per one of the exceptions, the project is still required to meet applicable solar readiness requirements of §110.10.**



## Solar Readiness

### > §110.10



### Mandatory Requirements

Single-family buildings and low-rise multifamily buildings that do not have a PV system installed may be required to be ready for installation of future solar systems such as PV or solar thermal.

**Table 3: When Does a Project Need to Consider Solar Readiness per the Energy Code?**

Project Scope	Solar Readiness Requirements
Newly constructed single-family in a subdivision of 10 or more homes, or low-rise multifamily building, in which: <ul style="list-style-type: none"> <li>✦ Project is eligible for a PV exception, or</li> <li>✦ The Performance Approach was used with 0 kW of PV modeled for the proposed building, and the report indicates the building “Complies”</li> </ul>	<b>YES</b>
Adding onto an existing low-rise multifamily building that includes more than 2,000 ft <sup>2</sup> of new roof area	<b>YES</b>
Adding onto an existing low-rise multifamily building that includes less than or equal to 2,000 ft <sup>2</sup> of new roof area	No
Adding onto an existing single-family building, or converting an existing building on a single-family property to newly conditioned space	No
Altering an existing building	No
Altering an existing PV system	No

✦ **Solar zone location** is where solar panels can be installed at a future date. A solar zone area is designed with no penetrations, obstructions, or significant shade and must comply with the access, pathway, smoke ventilation, and spacing requirements in Title 24, Part 9.

» **Single-family buildings:** 250 ft<sup>2</sup> or more located on roof or overhang of the building. The solar zone can be reduced to no less than 50% of the potential area if meeting the criteria of Exception 4 to §110.10(b)1A. The solar readiness area can be reduced to 150 ft<sup>2</sup> when any of the following apply:

- Home has three or more habitable stories AND the total floor area is 2,000 ft<sup>2</sup> or less,
- Home is within a Wildland-urban Interface Fire (WUI) area **and** includes a whole-house cooling ventilation fan,
- Home includes a wi-fi HVAC thermostat meeting the demand responsive requirements of §110.12(a), and is capable of receiving and responding to signals before occupancy permit is granted.

» **Low-rise multifamily buildings:** The solar zone must be located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 ft of the building, or on covered parking, installed with the building project.

The solar zone must make up at least 15% of the total roof area of the building, excluding any skylight area. The solar zone is to have no obstructions and is at least twice the distance from any obstruction outside the solar zone on the South, East, and West orientations. The solar zone can be less than 15% of roof area if it is no less than 50% of the potential solar zone area, once areas with less than 70% annual solar access are removed.

✦ **Azimuth range** for solar zones on steep-sloped roofs to have an azimuth between 90° and 300° of true north

#### ✦ **Minimum Dimension Requirements:**

- » **Buildings with at least 10,000 ft<sup>2</sup> of roof area:** Each reserved area to be at least 5 ft in width and comprise at least 80 ft<sup>2</sup>
- » **Buildings with over 10,000 ft<sup>2</sup> of roof area:** Each reserved area to be at least 5 ft in width and comprise at least 160 ft<sup>2</sup>

✦ **Interconnection pathways** include locations for an inverter, metering equipment, and electrical conduits noted on construction documents. For single-family buildings, and low-rise multifamily buildings with central water-heating systems, plumbing routes from the solar zone to the water heater location must be noted on construction documents.

✦ **Documentation of solar-ready provisions** must be provided to the occupant to support a streamlined effort to add PV or solar thermal systems in the building's future.

✦ **Main electrical service panel of a single-family building** must have a minimum busbar rating of 200 amps and a reserved space to allow for the installation of a double pole circuit breaker for a future solar PV system permanently labeled "For Future Solar Electric".

**Note:** busbar rating may be superseded by the BESS-readiness requirements in [§150.0\(s\)](#). See exceptions.

## Exceptions to Solar Readiness

### Single-family Projects:

- ✦ Solar thermal system installed serving domestic hot water system with a solar savings fraction of 0.50 or greater. Installation to meet criteria of RA4.
- ✦ Home includes a wi-fi HVAC thermostat meeting the demand responsive requirements of [§110.12\(a\)](#) **and** meets the additional requirements of Exception 6 to [§110.10\(b\)1A](#).

### Low-rise Multifamily Projects:

- ✦ Wi-fi HVAC thermostat meeting the demand responsive requirements of [§110.12\(a\)](#) installed in all dwelling units **and** meets the additional requirements of Exception 4 to [§110.10\(b\)1B](#)
- ✦ Roof is designed and approved for parking or for a heliport



# Energy Storage Systems

## Battery Energy Storage System (BESS) Readiness

› [Section 150.0\(s\)](#)

**Table 5: When Does a Project Need to Provide BESS Readiness per the Energy Code?**

Project Scope	BESS Readiness Requirements
Newly constructed single-family building that does not include a BESS	YES
Newly constructed duplex building that does not include a BESS	YES
Newly constructed townhome project with two or fewer dwelling units that does not include a BESS	YES
Newly constructed single-family, duplex or townhome project with two or less dwelling units that includes a BESS of any size	No
Newly constructed single-family building with three or more dwelling units	No
Newly constructed low-rise multifamily building	No
Adding onto an existing building, or converting an existing building to newly conditioned space	No
Altering an existing building	No
Altering an existing BESS system	No

For a single-family building to meet BESS readiness requirements, it must have BESS-ready interconnection equipment to accommodate the connection of a battery or other electricity generator capable of isolation from the grid. Interconnection equipment includes a BESS-ready panelboard that can switch between the grid and a local generator or battery.

Fully installed battery systems are not Mandatory or Prescriptive requirements for single-family and multifamily low-rise projects. They are a compliance option when using the Prescriptive Approach for PV flexibility or for the Performance Approach.



### Performance Approach

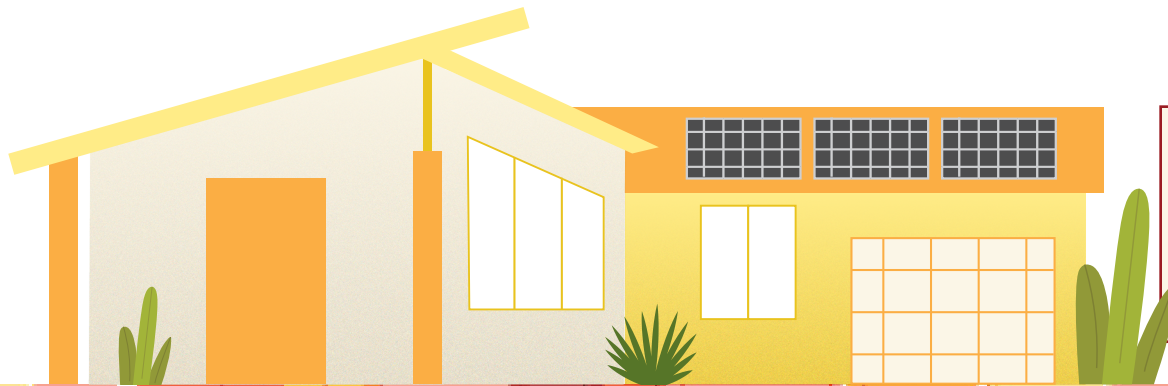
Although new single-family and low-rise multifamily buildings do not require a fully installed BESS, there is an optional Performance Approach credit available for projects that install one. This credit is applied to the Efficiency Long term System Cost (LSC), Total LSC, and Source metric. The BESS must be a minimum five kWh of storage capacity and meet the qualification requirements of JA12. Various BESS control options are available for additional compliance credit.

For more information, see the 2025 Single-family Residential Alternative Calculation Method Reference Manual or the 2025 Nonresidential and Multifamily Alternative Calculation Method Reference Manual.

## BESS Readiness Installation Requirements

BESS readiness applies to new single-family home projects with one or two dwellings where load-serving-entity (i.e. utility) provides services of more than 125 Amp service. Projects with a BESS in the proposed design are exempt. These project must have the following:

- ✦ Main panel board minimum busbar rating of 225 amps
- ✦ Four or more branch circuits in a subpanel designed for a future BESS feeding:
  - » Refrigerator
  - » One lighting circuit near the primary egress
  - » A sleeping room receptacle outlet
  - » A fourth location, wherever desired
- ✦ Space reserved for future installation of a system isolation equipment or a transfer switch within three feet of the main panelboard
- ✦ Raceways between the panelboard and the system isolation equipment or transfer switch location to connect a backup power source
- ✦ At least one of the following:
  - » Interconnection equipment with a minimum backed up capacity of 60 amps
  - » A dedicated raceway from the main service to a subpanel that supplies the branch circuits



### Fire Code Requirements

BESS must comply with the requirements of the California Fire Code (CFC) §1206. This should be considered when determining the location for BESS Readiness.

# 2025 Solar and BESS Readiness Compliance Forms

The following table describes compliance forms by occupancy type. The [Virtual Compliance Assistant \(VCA\)](#) from [energycodeace.com](#) is a free online tool that helps you identify and prepare compliance forms for a variety of projects.

**Table 6: Required Forms for Solar and BESS Readiness Compliance**

Occupancy or Building Type	Certificates of Compliance	Certificates of Installation	Certificates of Verification
<b>Single-family Buildings</b>	<p><b>CF1R-NCB-01-E:</b> This Prescriptive form must be completed via an ECC provider</p> <p><b>CF1R-PRF-01-E:</b> This Performance form must be filled out with CEC-certified software and registered via an ECC provider</p>	<p><b>CF2R-PVB-01-H:</b> PV Systems</p> <p><b>CF2R-PVB-02-E:</b> BESS</p> <p><b>CF2R-SRA-01-E:</b> Solar Readiness Areas</p> <p><b>CF2R-SRA-02-E:</b> Solar Readiness Worksheet</p> <p>These forms must be completed by the installer and must completed via an ECC provider</p>	Not Applicable
<b>Multifamily Buildings ≤ 3 Habitable Stories (Low-rise)</b>	<p><b>LMCC-PRF-E:</b> This Performance form must be filled out with CEC-certified software and then registered via an ECC provider</p>	<p><b>LMCI-SAB-E:</b> PV, BESS and Solar Readiness</p> <p>This form is available through the VCA</p>	Not Applicable

**ECC** = Energy Code Compliance Verification

**For single-family buildings,** forms are available on the [Energy Code Ace Get Forms landing page](#).

- ✦ The CF1R form defines Energy Code requirements for a whole project, including any solar and BESS requirements. If there are ECC verification requirements, the form must be registered via an ECC provider. Find an ECC Provider at [energy.ca.gov](#).
- ✦ The CF2R form must be provided by installers to match or exceed the CF1R form solar and BESS requirements. If there are ECC verification requirements, the form must be registered via an ECC provider. Find an ECC Provider at [energy.ca.gov](#).

**For low-rise multifamily buildings,** forms are supported on the [Energy Code Ace Get Forms landing page](#).

- ✦ LMCC Prescriptive forms are available through the VCA at [energycodeace.com/content/project-tool](#).
- ✦ LMCC Performance forms are available by using CEC-approved Performance compliance software. See more about this software at [energy.ca.gov](#). If there are ECC verification requirements, the form must be registered via an ECC provider. Find an ECC Provider at [energy.ca.gov](#).
- ✦ The LMCI form must be provided by installers to match or exceed the LMCC form solar and BESS requirements. These forms are available through the VCA at [energycodeace.com/content/project-tool](#).

## For More Information



[energycodeace.com](https://energycodeace.com)

Your “one-stop-shop” for no-cost tools, training, and resources to help you comply with California’s Building Energy Efficiency Standards (Title 24, Part 6) and Appliance Efficiency Standards (Title 20).



Create an account on the EnergyCodeAce.com website and select an industry role for your profile in order to receive our newsletter and messages about all our offerings!



Did you know you can get your questions answered by an industry expert?

Use our “[Submit a Question](#)” option on our website to connect with our team or scroll through **Q&Ace** to find answers to commonly asked questions.

### Ace\*Tools™

[energycodeace.com/tools](https://energycodeace.com/tools)

Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques, and efficiency regulations in California.

- ✦ [Reference Ace](#): Navigate Title 24, Part 6 using an index, keyword search, and hyperlinked text.
- ✦ [Q&Ace](#): Search our online knowledge base or submit your question to Energy Code Ace experts.
- ✦ [Product Finder](#): Find Title 24, Part 6 compliant products.

### Ace\*Training™

[energycodeace.com/training](https://energycodeace.com/training)

On-demand, live in-person, and online training alternatives are tailored to a variety of industry professionals and address key measures.

Of special interest:

- ✦ [2025 Title 24, Part 6 Essentials – Nonresidential Standards: What’s New](#)
- ✦ [2025 Title 24, Part 6 Essentials – Residential Standards: What’s New](#)

### Ace\*Resources™

[energycodeace.com/resources](https://energycodeace.com/resources)

Downloadable materials provide practical and concise guidance on how and when to comply with Title 24, Part 6 and Title 20.

Of special interest:

- ✦ [2025 Title 24, Part 6: What’s New Multifamily fact sheet](#)
- ✦ [2025 Title 24, Part 6: What’s Changed Multifamily fact sheet](#)
- ✦ [2025 Title 24, Part 6: What’s New Single-family fact sheet](#)
- ✦ [2025 Title 24, Part 6: What’s Changed Single-family fact sheet](#)

# Assembly Bill 130

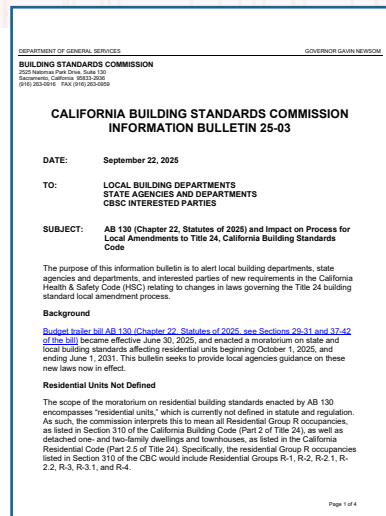
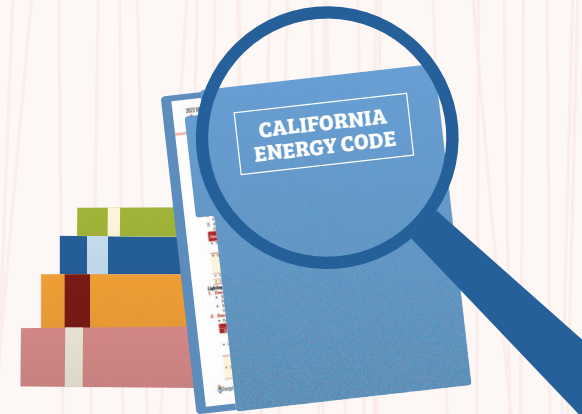
“Governor Gavin Newsom signed Assembly Bill 130, which pauses new updates to the California Building Standards Code, including the Energy Code, that affect residential units until January 1, 2032. The law also limits cities and counties in adopting stricter local building codes on or after October 1, 2025, unless specific conditions are met.

Please note that the 2025 Energy Code has been adopted and will go into effect as scheduled January 1, 2026. Future updates to Title 24 Part 6 (Energy Code) or Title 24 Part 11 (Environmental Code) that affect residential units will not go into effect before January 1, 2032.”

- CEC Blueprint Newsletter #150

## For more information, please visit:

- ✦ [CEC Blueprint Newsletter #150, Summer 2025](#)
- ✦ [Building Standards Commission's Information Bulletin 25-03: AB 130 Impacts](#)
- ✦ [California Building Standards Commission \(CBSC\) newsletters and bulletins](#)





**California Energy Commission (CEC)**  
[energy.ca.gov](http://energy.ca.gov)

Learn more about the CEC and its programs.

- ✦ [2025 Building Energy Efficiency Standards:](#) Explore the main CEC web portal for the 2025 Energy Code, including information, documents, and historical information.
- ✦ [2025 California Energy Code Fact Sheet:](#) Download this brief summary of the Title 24, Part 6 purpose, current changes, and impact.
- ✦ [California Appliance Efficiency Standards Site:](#) Visit this site for information on California’s Title 20 Appliance Efficiency Regulations.
- ✦ **Energy Code Hotline**
  - » Call: 1-800-772-3300 (Free)
  - » [Submission Form](#)
- ✦ [Energy Code Support Center:](#) Use these online resources developed for building and enforcement communities to learn more about Title 24, Part 6.
- ✦ 2025 Single-family Residential Compliance Manual, Ch. 7: [bit.ly/SF-Res-Compliance-Manual-Chapter-7](#)
- ✦ 2025 Nonresidential and Multifamily Compliance Manual, Ch. 11, 11.9: [bit.ly/NR-MF-Compliance-Manual-119-PV-Shared-Battery-Storage](#)
- ✦ Joint Reference Appendix JA11, Qualification Requirements for Photovoltaic System: [bit.ly/Joint-Ref-Appendix-JA11](#)
- ✦ Joint Reference Appendix JA12, Qualification Requirements for Battery Storage System: [bit.ly/Joint-Ref-Appendix-JA12](#)
- ✦ [2025 Energy Code Compliance Software:](#) Use CEC-approved software when following the Performance Approach of compliance for the 2025 Energy Code.
- ✦ [2025 Single-Family Residential Alternative Calculation Method Reference Manual](#)
- ✦ [2025 Nonresidential and Multifamily Alternative Calculation Method Reference Manual](#)
- ✦ CEC-approved Solar Assessment Tools: [bit.ly/CEC-Solar-Assessment-Tools](#)
- ✦ Solar Equipment Lists: [solarequipment.energy.ca.gov/Home/Index](http://solarequipment.energy.ca.gov/Home/Index)

## Additional Resources

### Title 24 Stakeholders [title24stakeholders.com](http://title24stakeholders.com)

The Codes and Standards Enhancement (CASE) initiative presents recommendations to support the CEC’s efforts to update Title 24, Part 6 to include new requirements or to upgrade existing requirements for various technologies. Three California investor-owned utilities sponsor this effort. The Statewide CASE Team encourages the open exchange of comments and concerns from all stakeholders engaged in the Title 24, Part 6 code change process. Contact them and they will put you in touch with the appropriate CASE Team members.

### Reach Codes [localenergycodes.com](http://localenergycodes.com)

Collaborating with cities, counties, and stakeholders to drive reach code development and adoption for long-term climate and energy efficiency benefits. View a list of adopted ordinances at the link provided.

### Energy-Smart Homes [caenergysmarthomes.com](http://caenergysmarthomes.com)

Learn more about incentives for installing advanced energy measures in all-electric homes.



This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company (SCE) under the auspices of the California Public Utilities Commission.

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