

BLUEPRINT

CALIFORNIA ENERGY COMMISSION
EFFICIENCY DIVISION

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The CEC welcomes feedback on Blueprint. Please contact the editor at Title24@energy.ca.gov

2025 Energy Code: Nonresidential Summary of Changes

The 2025 Energy Code adds new requirements for heat pump water heater (HPWH) installations in newly constructed buildings, including ventilation and pipe insulation. It also sets a new heat pump baseline for multizone space-conditioning systems serving office and school buildings under the prescriptive requirements. Other updates include increasing envelope efficiency, improved calculation methods for solar photovoltaic (PV) and battery energy storage system (BESS), expanded PV and BESS requirements for additional building types, clarifying and simplifying lighting requirements, and increased efficiency for pool- and spa-heating equipment.

Solar PV and Battery Energy Storage Systems

- Adds building types in Tables 140.10-A and 140.10-B: events and exhibits, religious worship, sports and recreation, as defined under Section 100.1. Section 140.10(a-b)

- Updates photovoltaic (PV) sizing – multiply square footage of total solar access roof area (SARA) by 18 W/sqft for steep-sloped roofs, and 14 W/sqft for low-sloped roofs. Section 140.10(a)
- Increases PV capacity factors in Table 140.10-A, Section 140.10(a) for:
 - Libraries in Climate Zones 2–16
 - Hotel/motel, medical office building/clinics, restaurants, retail, grocery in all climate zones
- Updates Exception 5 for tenant spaces no more than 2,000 square feet with separate utility meter and HVAC system in multitenant buildings. These spaces are excluded from the PV calculation. Section 140.10(a)
- Updates Equations 140.10-B, -C, and -D for determining BESS minimum energy and power capacities. Section 140.10(b)
- Revises Table 140.10-B, Section 140.10(b):
 - BESS capacity factors revised for all building types

- Schools, offices, financial institutions, unleased tenant spaces, medical office buildings/clinics in Climate Zone 1 do not require BESS.

Heating, Ventilation and Air Conditioning (HVAC)

- Adds additional parameters for determining maximum achievable cycles of concentrations in mandatory cooling tower requirements. Section 110.2(e)
- Updates minimum ventilation rates, minimum exhaust rates, and classes of air streams or sources. Tables 120.1-A, -B and -C
- Adds mandatory limit for supply hot water temperature for space heating to no greater than 130°F. Section 120.2(l)
- Adds acceptance testing requirements. Section 120.5(a):
 - Dedicated outside air systems (DOAS), heat recovery ventilation (HRV), or energy recovery ventilation (ERV) systems, with exceptions
 - Conductivity controls and overflow alarms for open- and closed-circuit cooling towers
- Adds prescriptive requirements for multizone HVAC systems in offices and schools not greater than 150,000 square feet or five habitable stories, except for schools in Climate Zones 6 and 7. Section 140.4(a)3

- Adds the ASHRAE Handbook, Fundamentals Volume as an option for outdoor design conditions for systems serving non-healthcare facilities. Section 140.4(b)3A
- Adds prescriptive requirements per ASHRAE Guideline 36: for variable-air-volume (VAV) systems control sequence of operation for static pressure setpoint reset, space-conditioning zone controls with direct digital controls (DDC), air economizer with DDC system, and supply air temperature reset controls. Section 140.4(c-f, r)
- Revises prescriptive requirements for axial fan open-circuit cooling tower efficiency. Section 140.4(h)5
- Adds prescriptive requirements for mechanical heat recovery. Section 140.4(s)
- Adds requirements in Table 141.0-E-1 for new or replacement single zone packaged rooftop air conditioner or heat pump less than 65,000 Btu/hr. Section 141.0(b)2Cii

Lighting and Electrical

- Adds requirements for manual controls to be in same space as controlled lighting or located so that controlled lighting or status can be seen when operating controls. Section 130.1(a)2

- Multilevel controls must provide and enable continuous dimming from 100 to 10 percent or lower; exception for high-intensity discharge (HID) and induction light sources to have at least one control step between 30 and 70 percent of full power. Section 130.1(b)
- Removes Table 130.1-A. Section 130.1(b)
- Updates occupant sensing controls must have no more than 20-minute time delay. Section 130.1(c)1A
- Adds requirements for lighting in stairwells and common area corridors that provide access to guestrooms of hotel/motels shall be controlled by occupant sensing controls that separately reduce the lighting power in each space by at least 50 percent when the space is unoccupied instead of completely shutting off. Section 130.1(c)6C
- Clarifies occupant sensing controls requirements for warehouse areas, library stack aisles, corridors and stairwells, offices greater than 250 square feet, parking and loading/unloading areas; all occupancy sensing control zones in offices greater than 250 square feet must be shown on plans. Section 130.1(c)6



- Updates daylight responsive controls requirements for sidelit and skylit daylight zones with 75 watts (W) or greater of general lighting in indoor spaces, 60 W or greater for garages. Secondary sidelit daylight zones with less than 85 W of general lighting exempt, if primary sidelit daylight zones do not require daylight responsive controls. Section 130.1(d)1
- Requires that luminaires longer than 8 feet must be controlled in segments up to 8 feet, unless they contain factory-assembled housing and light source as an integral unit in segments longer than 8 feet. These luminaires may be controlled according to the type of daylight zone in which the segment is primarily located. Section 130.1(d)2Biii
- Clarifies requirements for occupancy sensing controls for space-conditioning systems. Section 130.1(f)
- Updates motion sensing controls exception for building façade, ornamental hardscape, and outdoor dining areas. Section 130.2(c)3A
- Adds acceptance testing requirement for controlled environmental horticulture (CEH) lighting. Section 130.4(a)
- Removes Tailored Method of calculating lighting power allowances; moved some Tailored Method allowances as additional lighting power allowances to Area Category Method. Section 140.6

- Removes several automatically compliant sign light sources. Section 140.8(b)
- Requires that controlled receptacles in hotel/motel guestrooms must shut off within 20 minutes of vacancy. Section 130.5(d)4

Envelope

- Adds mandatory area-weighted U-factor 0.47 for exterior vertical fenestration assemblies. Exception for fenestration installed in Fire Hazard Severity Zones or Wildland-Urban Interface (WUI) Fire Areas. Section 120.7(d)
- Adds mandatory U-factor 0.58 for vertical fenestration replacements over 150 square feet and 0.47 for added vertical fenestration over 50 square feet. Section 141.0(b)1E
- Adds mandatory vestibule requirement at public entrances that open into spaces 3,000 square feet or more in newly constructed buildings of Occupancy Types A, B, E, I, and M. Multiple exceptions apply. Section 120.7(e)
- Reduces prescriptive maximum U-factors in Table 140.3-B for roofs and ceilings, and certain wall assembly types. Section 140.3(a)

Water Heating

- Adds backup heat required for heat pump water heater (HPWH) with unconditioned inlet air, unless compressor cutoff temperature below local Heating Winter Median of Extremes per Reference Joint Appendix JA2, Table 2-3. Section 110.3(c)7A
- Adds ventilation or minimum room volume requirements when installing consumer integrated HPWH. Section 110.3(c)7B
- Splits Table 120.3-A into Tables 120.3-A1 and -A2. Section 120.3

Pools and Spas

- Updates mandatory requirements for permanent, readable, and weatherproof label with energy efficiency rating and instructions for efficient pool and spa heater operation. Section 110.4(a)3
- Adds a requirement that pool and spa heaters must be tested to new standards, by fuel type. Section 110.4(b)
- Adds mandatory requirements for primary pool and spa heaters to be heat pump and/or solar, or use at least 60 percent renewable or recovered energy, sized appropriately. Several exceptions apply. Section 110.4(c)
- Updates controls for heat pump pool heaters must prevent supplementary heating when load can be met by heat pump alone. Section 110.4(d)

ENERGY CODE

HOTLINE

Available to help with
Energy Code
(Title 24, Part 6) questions

SUBMISSION FORM

www.energy.ca.gov/energy-code-hotline-submission

SUPPORT CENTER FAQs

www.energy.ca.gov/energy-code-support-center

Covered Process

- Adds mandatory insulation requirements for pipes that carry heated or chilled fluids used in processes unrelated to space conditioning or water heating. Updates pipe insulation requirements in Tables 120.3-A1 and -A2. Section 120.3(a)
- Adds efficiency requirements for fan-powered evaporators using volatile refrigerants. Exception for evaporators for quick chilling/freezing. Updated efficiencies in Table 120.6-A-2. Section 120.6(a)3D
- Adds requirement for 0.5-inch applied static pressure drop maximum for evaporators. Section 120.6(a)3E

- Updates efficiency requirements for controlled environment horticulture (CEH) lighting systems to no less than 2.3 micromoles per joule. Section 120.6(h)
- Adds mandatory electric readiness requirements for newly constructed quick-service and institutional commercial kitchens. Exceptions are provided for healthcare facilities, all-electric commercial kitchens. Section 120.6(k)
- Updates requirements for laboratory and factory exhaust systems. Section 140.9(c)
- Adds alteration requirements for process piping. Section 141.1(d)

Performance Compliance

- The energy budget is now expressed in terms of Long-term System Cost (LSC) and Source Energy. LSC is categorized as Efficiency LSC and Total LSC with Efficiency LSC energy being the sum of the LSC energy for space-conditioning, water heating, mechanical ventilation, and lighting and Total LSC being the sum of Efficiency LSC and the LSC energy from the photovoltaic system, battery energy storage system, and demand flexibility. The Source Energy budget sums the same end uses as Total LSC but in Source Energy instead of LSC. Section 140.1(a)

First Hour Ratings for Storage Water Heaters

Reference Joint Appendix JA13.3.2 of the **2022** and **2025** Energy Codes requires heat pump water heaters (HPWHs) to meet a minimum first hour rating (FHR). Table 501.1(2) of the 2022 California Plumbing Code specifies the FHR requirement for storage water heaters based on the number of bedrooms and bathrooms in a dwelling unit. Table 501.1(2) includes a note that a water heater's FHR is found on the "Energy Guide" label. The Energy Guide label FHR does not address water heaters with integrated thermostatic mixing valves that can boost storage capacity and FHR by maintaining a storage tank temperature setpoint more than five degrees above the delivery temperature.

To address storage water heaters capable of achieving storage temperatures above 135°F, the U.S. Department of Energy has developed a new federal test procedure that goes into effect May 6, 2029, and includes new high-temperature testing requirements. Until May 6, 2029, such water heaters may voluntarily represent high-temperature performance based on the new test procedure.

Building officials may choose to accept these FHRs based on the high-temperature test procedure, which will be documented in manufacturers' literature. Doing so may allow installation of smaller- and/or lower-voltage heat pump water heaters in these jurisdictions. See **10 CFR Part 430, Subpart B, Appendix E** for more information.

ASHRAE Guideline 36 for the 2025 Energy Code

The 2025 Energy Code Section 140.4(r) prescriptively requires HVAC direct digital controller (DDC) logic to come from a programming library based on ASHRAE Guideline 36. Key considerations for complying with the new requirements are outlined in the Q&As below.

- What are the rules on updates for both ASHRAE Guideline 36 and the 2025 Energy Code?
 - The contractor's library will be certified once. If the CEC adopts a new version of Guideline 36 that affects Reference Joint Appendix JA18, then manufacturers may need to recertify. If the manufacturer updates the library and none of the changes apply to Reference Joint Appendix JA18, the original certification will stand.
- How will bug fixes in certified libraries be handled?
 - The CEC would review the portion of the logic being altered. If it's an unrelated bug fix and needs a new software version, a written statement describing the change along with a declaration for the new software version would be acceptable.
- How do the certification requirements in Section 140.4(r) relate to other references to Guideline 36 in Section 140.4?
 - If the programming library is certified per Section 140.4(r) and Reference Joint Appendix JA18, then it should meet all other requirements mentioning Guideline 36 (e.g., Sections **140.4(c)2**, **140.(d)2**). References before Section 140.4(r) are historical requirements for functionality, while the new requirements within Section 140.4(r) are specifically to certify the programming libraries that these functions originate from.
- Can a noncertified library still comply with the 2025 Energy Code?
 - Yes. Section 140.4(r) is a prescriptive requirement. Noncertified libraries can still bid on projects, but the project would need to comply with the 2025 Energy Code using the performance compliance approach.
- Can manufacturers submit for certification after the 2025 Energy Code goes into effect?
 - Yes, any manufacturer can submit at any time but will not be able to use programming libraries for compliance until the certification in accordance with Section 140.4(r) is complete.
- Is there a process to handle intellectual property and code developed by each manufacturer?
 - Yes. **Download the application for confidential designation** and file it with the CEC Docket Unit. This process can take up to 30 days. Manufacturers may also **contact the Docket Unit** with questions about the Confidentiality Designation.

AB130 Informational Bulletins

The California Building Standards Commission (CBSC) has released guidance on the enforcement of Assembly Bill 130. Visit the **CBSC Newsroom** for full details. Please note that the 2025 Energy Code has been adopted and will go into effect as scheduled January 1, 2026.

CBECC 2025 Software Update

Recently approved versions of the 2025 Energy Code compliance software are available:

- Single-family, nonresidential and multifamily buildings: CBECC 2025.2.0

Commercial Kitchens

Can a commercial kitchen with a 480V electrical service run lower amperage than specified under Section 120.6(k)1b of the 2025 Energy Code?

No. The requirement for a minimum capacity of 800A electrical service applies to the panel that serves the cookline appliances. This requirement is mandatory and can only be avoided by claiming an Exception to Section 120.6(k).

Lighting

Do the controlled environment horticulture (CEH) lighting requirements under Section 120.6(h)2 (2022) apply to spaces in nonresidential buildings with less than 40 kW of horticultural lighting?

No. Up to 40 kW of horticultural lighting specifically for plant growth are not subject to those requirements. However, general lighting in these spaces will still need to meet all applicable requirements.

Solar PV

Is solar PV required for churches under the 2022 Energy Code?

Possibly. **Section 140.10(a)** requires newly constructed nonresidential buildings to

Permit applications submitted on or after January 1, 2026, must use approved 2025 Energy Code compliance software and forms. Visit the 2025 Energy Code compliance software webpage for all of the approved software and the expiration dates.

CBECC 2025.2.0 will also feature a checkbox to allow designers of campus buildings under jurisdiction of the Division of the State Architect (DSA) or the California State University (CSU) to meet the solar PV requirements under the 2025 Energy Code by following relevant procedures from those agencies. When the checkbox is selected, the form will display a message that the project intends to follow DSA or CSU procedures for school campus PV systems to comply.

Local authorities having jurisdiction (AHJs) aside from DSA or the CSU are advised to disregard this message, if seen on their documentation.

EER/SEER Table Reference

Federal space-conditioning minimum efficiency requirements can be adopted between the triennial editions of the California Energy Code, which can cause confusion. Therefore, the 2025 Energy Code Section 110.2 does not list the federal minimum efficiency requirements for space-conditioning systems.

However, a reference resource has been compiled to help consolidate the latest values for builders. Please see the **2025 Space Conditioning Efficiency Tables** on the **2025 Energy Code webpage**.

Energy Code Support Center Updates

Please visit the Energy Code Support Center webpage for resources including fact sheets, FAQs, guides, presentations, training classes, videos, and links to additional resources. New resources include:

- **Electric Ready requirements web page**
- Online FAQs:
 - **2025 Single-Family Solar PV**
 - **2025 Single-Family Battery Energy Storage Systems (BESS) Ready**
 - **2025 Low-rise Multifamily Solar PV**
 - **2025 High-rise Multifamily Solar PV**
 - **2025 High-rise Multifamily Battery Energy Storage System (BESS)**
 - **2025 Nonresidential Solar PV**
 - **2025 Nonresidential Battery Energy Storage System (BESS)**

install solar PV, if 80 percent of the total floor area is made up of space types listed under **Table 140.10-A**.

Churches are not specifically listed but can have enough floor area made up of listed space types (for example, office, school, auditorium). The local code enforcement agency can confirm the space types found within a building.

Are freestanding carports included in solar access roof area (SARA) calculations for nonresidential and multifamily buildings?

Yes. Sections **140.10(a)1**, **170.2(f) A**, and **170.2(g)1** of the 2025 Energy Code specify that SARA includes roof areas that can structurally support a PV system per the California Building Code, Part 2, Section 1511.10. SARA includes all roof space on covered parking areas, carports, and all other newly constructed structures onsite that can support a PV system.

If the project includes multiple buildings, the freestanding carport can be included on the compliance forms for any of the buildings on the same project.

Do the PV panels required by the Energy Code to meet the minimum PV system capacity for each building in a newly constructed multibuilding or nonresidential project have to be located on that building?

No. **Section 140.10(a)** sets the minimum kWdc of the solar PV system for each building but does not specify where it must be located, as long as the PV system is on the same project site. The PV system can be located on each building, all on one building, or even on the ground (see SARA requirements above). The enforcement agency will determine whether each building requires a permit application, and must approve the location and the allocation of the PV system generation to each building. Note that the load-serving entity may have interconnection requirements that need to be met.

FOR MORE INFORMATION

Energy Code Support Center:

www.energy.ca.gov/energy-code-support-center

2025 Energy Code Webpage:

www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency

2025 Approved Compliance Software:

www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-energy-code-compliance-software

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Blueprint newsletter serves as a resource to assist stakeholders in complying with the Energy Code. It does not provide legal advice. Please refer to California Code of Regulations, Title 24, Parts 1 and 6 for specific requirements.



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