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BLUEPRINT

CALIFORNIA ENERGY COMMISSION
EFFICIENCY DIVISION

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2025 Energy Code: Single-Family Summary of Changes

One of the significant changes in the 2025 Energy Code for single-family buildings is the prescriptive requirement for both water heating and space heating to be heat pumps. The 2025 Energy Code updates increase the building envelope efficiency, refine solar photovoltaic calculations, clarify the requirements for lighting, and increase the efficiency of pool and spa heating equipment.

Solar PV and Battery Energy Storage System Ready

- Updates mandatory battery energy storage system (BESS) readiness for newly constructed, single-family, one or two dwelling units with electrical service over 125A. BESS-ready is not required if BESS is installed. Section 150.0(s)
- Updates PV sizing when using total solar access roof area (SARA): SARA multiplied by 18 for steep-sloped roofs and SARA multiplied by 14 for low-sloped roofs. Section 150.1(c)14

Envelope

- Updates mandatory wall insulation maximum U-factor of 0.095 for 2x4 wood framed (minimum R-15) and maximum U-factor of 0.069 for 2x6 or greater wood-framed (minimum R-21). Section 150.0(c)
- Updates prescriptive Table 150.1-A Option C for ventilated attic minimum R-38 in climate zones 1, 8-16, minimum R-30 climates zones 2-7; adds cathedral ceilings minimum R-38 in all climate zones. Section 150.1(c)1Aiii
- Updates mandatory weighted average maximum U-factor of 0.40 for all fenestration, including skylights. Section 150.0(q)
- Updates prescriptive maximum U-factor of 0.27 for fenestration in Climate Zones 1-5, 11-14, 16, and maximum U-factor of 0.30 in Climate Zones 6-10, 15; some exceptions may apply. Section 150.1(c)3A

HVAC

- Clarifies that block loads (total load for all rooms served by central equipment) may be used to size the system for additions. Section 150.0(h)1
- Updates mandatory heat pump minimum heating capacity to meet the California Building Code (CBC) minimum requirements, without accounting for supplementary heating; no maximum heating capacity limit; furnace heating capacity based on ACCA Manual S-2023, Table N2.5. Section 150.0(h)5
- Updates mandatory installer-adjustable defrost delay timers on heat pumps to be set to 90+ minutes; the installer tests and certifies on CF2R; some exceptions may apply. Section 150.0(h)6
- Updates mandatory heat pump supplementary heating to only operate at outdoor temperatures below 35°F, except during defrost or emergency operation; the installer tests and certifies on CF2R; some exceptions may apply. Section 150.0(h)7
- Updates mandatory electric resistance supplementary heat capacity not to exceed heat pump nominal cooling capacity; (95°F ambient conditions) times 2.7 kW per ton, rounded up to the closest kW. Section 150.0(h)8
- Adds mandatory variable or multi-speed systems controlled by third-party thermostats to be able to respond to loads by modulating compressor speed and meet Section 150.0(i)2. Section 150.0(h)9
- Updates mandatory thermostats controlling heat pumps with supplementary heat to require display of outdoor temperature from a sensor or internet weather service; also must indicate when supplementary or emergency heat is in use; and lock out supplementary heat when the outdoor temperature is above 35°F; the installer tests and certifies on CF2R; some exceptions may apply. Section 150.0(i)2
- Revises mandatory duct insulation in unvented attics; exception allows R-4.2 when other requirements are met. Section 150.0(m)1Bi
- Updates exception to mandatory requirements for multispeed or variable speed compressor systems with controls that vary fan speed per number of zones as certified by the installer may meet airflow and fan efficacy requirements by operating at maximum compressor capacity and fan speed, with all zones calling. Section 150.0(m)13C
- Updates mandatory whole dwelling unit mechanical ventilation requirements: balanced and supply-only systems accessibility of IAQ filters; HRV/ERV and IAQ system components; and outdoor air intake design, location, and accessibility. Section 150.0(o)1C

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

- Updates prescriptive requirements: heating equipment to be heat pump in all Climate Zones or meet performance requirements in Section 150.1(b)1; refrigerant charge verification for heat pumps in all Climate Zones, and air conditioners in Climate Zones 2, 8-15; HRV/ERV systems require fault indicator display with ECC-rater field verification. Section 150.1(c)6-7,15
- Updates additions maximum heating and cooling capacity limits in Tables 150.2-A and -B that depend on relative sizes of calculated heating design load and cooling design

load, type of space conditioning system, and duct sizing; envelope leakage specified in load calculation must not exceed values from Table 150.2-C; when ECC-rater field verified, tested envelope leakage value may be used. Section 150.2(a)1E

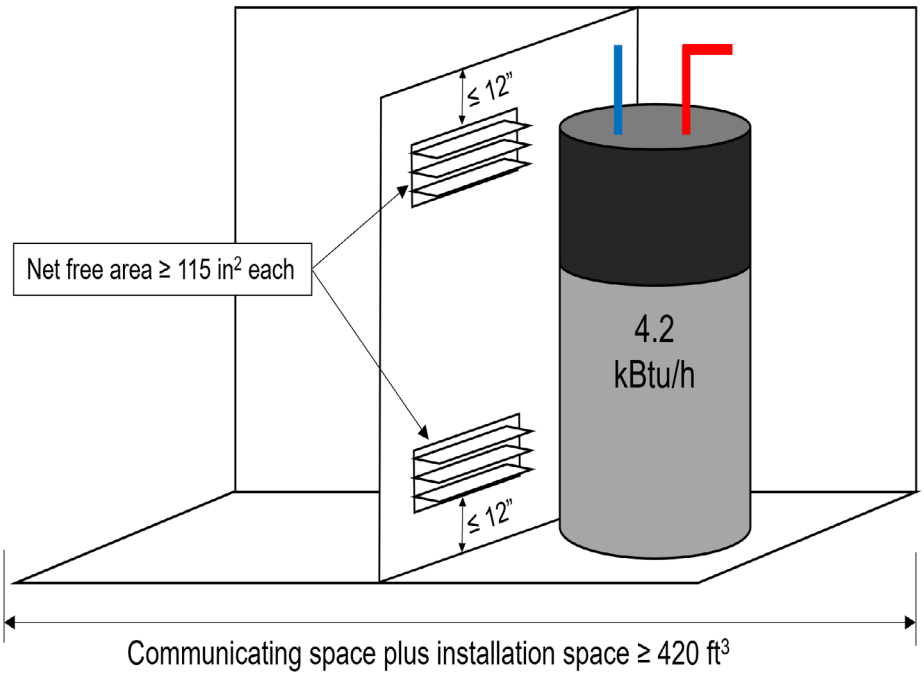
Lighting

- Updates all luminaires and light sources to meet Reference Joint Appendix JA8; some exceptions may apply; removes Table 150.0-A. Section 150.0(k)1A
- Updates lighting integral to kitchen range hoods and bathroom exhaust fans not to require dimming controls. Section 150.0(k)2F

Water Heating

- Updates requirements for backup heat in heat pump water heaters (HPWH) with unconditioned inlet air, unless compressor cutoff temperature below local Heating Winter Median of Extremes. Section 110.3(c)7A
- Adds ventilation or minimum room volume required when installing HPWH (Figure 1). Section 110.3(c)7B
- Updates mandatory requirement for a future HPWH conductor to be a minimum 30A branch circuit. Section 150.0(n)1Ai
- Removes exception for gas tankless water heaters in Climate Zones 3, 4, 13, and 14 in building with heat pump space conditioning. Section 150.1(c)8
- Removes gas tankless water heaters from prescriptive options for single-family additions. Section 150.2(a)1D

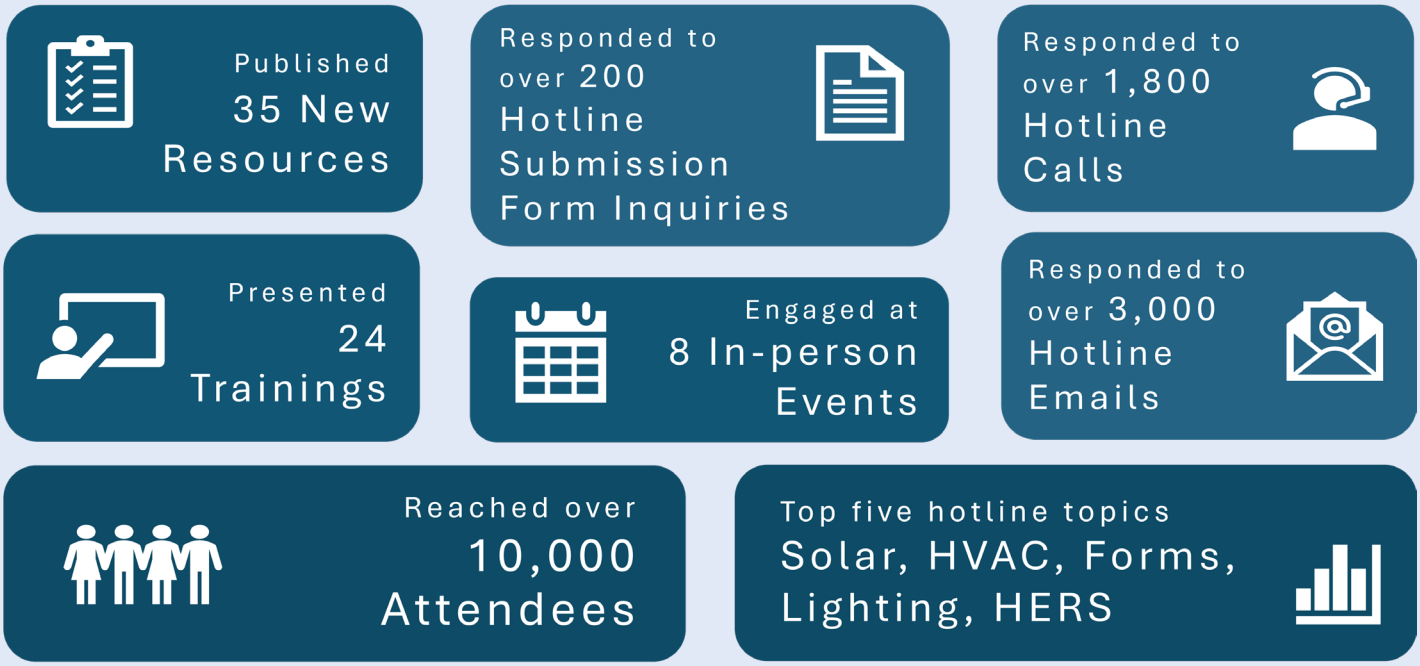
Figure 1: Example of HPWH ventilation per Section 110.3(c)7B3



Pools and Spas

- Adds pool and spa heaters must be tested to new standards, by fuel type. Section 110.4(b)
- Adds primary pool and spa heaters must be heat pump, solar, or use at least 60% renewable or recovered energy, and sized appropriately. Some exceptions may apply. Section 110.4(c)
- Updates controls for heat pump pool heaters to prevent supplementary heating when the load can be met by the heat pump alone. Section 110.4(d)
- Clarifies when dedicated-purpose pool pumps must meet Title 20, Section 1605.1(g) (7); replacement dedicated-purpose pool pump motors must meet Title 20, Section 1605.3. Section 150.0(p)1A
- Updates dedicated-purpose pool pumps with more than one speed to have controls that default to the filtration flow rate when auxiliary pool loads are not operating. Section 150.0(p)1D
- Updates dedicated-purpose pool pumps with more than one speed to have controls that default to filtration flow rate setting within 24 hours and have override capability for servicing. Section 150.0(p)1E

Outreach 2024 Year in Review



Performance Compliance

- Updates the energy budget is expressed in terms of long-term system cost (LSC) and source energy; LSC is categorized as Total LSC and Efficiency LSC; Total LSC is the sum of Efficiency LSC, the LSC for photovoltaic system, battery energy storage system, lighting, demand flexibility, and other plug loads; the Efficiency LSC energy is the sum of the LSC energy for space-conditioning, water heating, mechanical ventilation, and self-utilization credit. Section 150.1(a)

Download the final express terms for the 2025 Energy Code and the 2025 Reference Appendices on the **docket 24-BTSD-01**. Please visit the **2025 Energy Code webpage** for more information.

Compliance Software Updates

Recently approved versions of the 2022 Energy Code compliance software are available on the **2022 Energy Code compliance software webpage**.

Single-family buildings

- CBECC-Res 2022.3.2
- EnergyPro 9.4

Nonresidential and multifamily buildings

- CBECC 2022.3.2
- EnergyPro 9.4

All permit applications submitted on or after January 1, 2023, must comply using software and compliance forms approved for the 2022 Energy Code. Visit the **2022 Energy Code compliance software webpage** for all of the approved software and the expiration dates.

Energy Code Support Center Updates

Please visit the **Energy Code Support Center webpage** for resources including fact sheets, frequently asked questions, guides, presentations, training classes, videos, and links to additional resources. New resources on the **2025 Energy Code Overview webpage** include:

- Single-Family Summary of Changes
- Single-Family Mandatory Requirements
- Nonresidential Summary of Changes
- Multifamily Summary of Changes

Q&A

Single-Family Outdoor Lighting

Do outdoor lighting with LED light sources in enclosed or recessed luminaires need to meet the requirements of JA8 for the 2025 Energy Code?

No. Outdoor lighting with an LED light source installed in an enclosed or recessed luminaire does not need to meet the JA8 requirements per exception 4 to Section 150.0(k)1A. However, all non-LED light sources in enclosed or recessed luminaires must comply with the JA8 elevated temperature requirements per Section 150.0(k)1D.

For additional help with the Energy Code, see Energy Code Ace's **online offerings** of trainings, tools, and resources.

FOR MORE INFORMATION

Energy Code Support Center: www.energy.ca.gov/energy-code-support-center

Energy Code Compliance Program: www.energy.ca.gov/programs-and-topics/programs/energy-code-compliance-program

Home Energy Rating System (HERS): www.energy.ca.gov/HERS

Acceptance Test Technician Certification Provider Program (ATTCP): www.energy.ca.gov/ATTCP

2022 Approved Compliance Software: www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-1

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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.

CALIFORNIA ENERGY COMMISSION

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