



## California Energy Commission 2025 Building Energy Efficiency Standards What's New for Single-Family Residential

### Renewables and Storage

- 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 not required if BESS installed. § 150.0(s)
- Updates photovoltaic (PV) sizing using total solar access roof area (SARA). SARA multiplied by 18 for steep-sloped roofs and SARA multiplied by 14 for low-sloped roofs. § 150.1(c)14

### Heating, Ventilation, and Air Conditioning (HVAC)

- Clarifies that block loads (combined total load for all rooms served by central equipment) may be used to size system for additions. § 150.0(h)1
- Updates mandatory heat pump minimum heating capacity to meet 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. § 150.0(h)5
- Updates mandatory installer-adjustable defrost delay timers on heat pumps must be set to 90+ minutes. Installer tests and certifies on CF2R. Exceptions: Climate Zones 6-7; 500 square feet or less of conditioned floor area in Climate Zones 3, 5-10, 15. § 150.0(h)6
- Updates mandatory heat pump supplementary heating only operates at outdoor temperatures below 35°F, except during defrost or emergency operation. Installer tests and certifies on CF2R. Exceptions: heat pumps with supplementary heat in Climate Zones 7, 15, and 500 square feet or less following Option A or B; room air-conditioner heat pumps. § 150.0(h)7
- Updates mandatory electric resistance supplementary heat capacity cannot exceed heat pump nominal cooling capacity (at 95°F ambient conditions) x 2.7 kW/ton, rounded up to closest kW. § 150.0(h)8
- Updates mandatory variable or multi-speed systems controlled by third-party thermostats must be able to respond to loads by modulating compressor speed and meet § 150.0(i)2. § 150.0(h)9
- Updates mandatory thermostats controlling heat pumps with supplementary heat must display outdoor temperature from outdoor temperature sensor or internet weather service; must indicate when supplementary or emergency heat is in use, and lock out supplementary heat when outdoor temperature above 35°F. Installer tests and certifies on CF2R. Exception: systems compliant with § 150.0(h)7 or Exception 1 to § 150.0(h)7, room air-conditioner heat pumps. § 150.0(i)
- Revises mandatory requirements for ducts in unvented attics may be insulated to R-4.2 when other requirements met. § 150.0(m)1Bi
- Updates mandatory requirements for multi or variable speed compressor systems with controls that vary fan speed per number of zones as certified by installer may meet airflow and fan efficacy requirements by operating at maximum compressor capacity and fan speed, with all zones calling for conditioning. § 150.0(m)13
- Updates mandatory whole dwelling unit mechanical ventilation for single family dwellings to include requirements for balanced and supply-only systems regarding accessibility of indoor air quality (IAQ) filters, heat/energy recovery ventilation (HRV/ERV) recovery cores, IAQ system components, and outdoor air intake design, location, and accessibility. § 150.0(o)1C and § 150.0(o)1Civ
- Updates prescriptive requirements: heating equipment to be heat pump in all Climate Zones or meet performance requirements in § 150.1(b)1; refrigerant charge verification for heat pumps in all Climate Zones, and air conditioners in Climate Zones 2, 8-15; fault indicator display required for HRV/ERV systems with ECC-rater field verification. § 150.1(c)6-7,15
- Updates for maximum heating and cooling system capacity limits for additions in Tables 150.2-A and -B that depend on relative sizes of calculated heating design load (HL) and cooling design load (CL), type of space conditioning system, and duct sizing; envelope leakage specified in load calculation must not exceed values from Table 150.2-C (average for load calculation software); with ECC-rater field verification, tested envelope leakage value may be used. § 150.2(a)1E

### Electrical and Lighting

- Updates all luminaires and light sources to meet Reference Joint Appendix JA8. New exceptions: lighting integral to ceiling fan kits subject to DOE's Appliance and Equipment Standards Program; LEDs installed outdoors,

decorative colored solid state lighting (SSL) luminaires, high intensity discharge (HID) light sources, and luminaires with hardwired high-frequency generator and induction lamp. Removes Table 150.0-A. § 150.0(k)1A

- Updates lighting integral to kitchen range hoods and bathroom exhaust fans do not require dimming controls. § 150.0(k)2F

### **Envelope**

- Updates mandatory wall insulation maximum 0.095 U-factor for 2 x 4 inch wood framing (minimum R-15 with 16" on center) and maximum 0.069 U-factor for 2 x 6 wood-framing (minimum R-21 with 16" on center). § 150.0(c)
- Updates prescriptive Option C of Table 150.1-A ventilated attic minimum R-38 in climate zones 1, 8-16, minimum R-30 in climates zones 2-7. Adds cathedral ceilings minimum R-38 with no radiant barrier in all climate zones . § 150.1(c)1Aiii
- Updates mandatory maximum weighted average U-factor 0.40 for fenestration, including skylights. Exception: Fenestration installed in Fire Hazard Severity Zones. § 150.0(q)
- Updates prescriptive maximum U-factor 0.27 for fenestration in Climate Zones 1-5, 11-14, 16; maximum U-factor 0.30 in Climate Zones 6-10, 15 . Exception: 500 square feet or less in climate zone 5 allows maximum U-factor 0.30; up to 16 square feet of skylight in climates zones 2, 4, 6-16 allows maximum U-factor 0.30, SHGC 0.30. No SHGC requirement in climate zones 1, 3, 5, 16. § 150.1(c)3A
- Updates for alterations that increase new fenestration area or replace fenestration maximum SHGC value of 0.23 in Climate Zone 15. § 150.2(b)1

### **Plumbing**

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

### **Pools and Spas**

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

### **Performance Compliance**

- 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 and the LSC energy for the photovoltaic system, battery energy storage system, lighting, demand flexibility, and other plug loads; Efficiency LSC energy is the sum of the LSC energy for space-conditioning, water heating, mechanical ventilation, and self-utilization credit; and the source energy budget sums the same end uses as Total LSC, but in source energy. § 150.1(a)