



California Energy Commission

2022 Building Energy Efficiency Standards

What's New for Single-Family Residential

Single-Family What's New for 2022 Summary

The most significant change in the 2022 Building Energy Efficiency Standards (Energy Code) affecting single-family residential buildings is a single fuel prescriptive heat pump baseline for either water heating or space heating, depending on the climate zone. There are significant changes in requirements for indoor air quality. There are also new requirements and revisions for additions and alterations. Updated definition for single-family buildings and moved all multifamily requirements to Sections 160.0 to 180.4.

Mandatory Requirements

- Roof deck insulation maximum area-weighted average U-factor of U-0.184 in climate zones 4 and 8-16. §150.0(a)1
- Simplifies hot water piping language and defers to California Plumbing Code. §150.0(j)
- Simplifies and reorganizes language for lighting requirements. §150.0(k)
- Ducts in conditioned space do not require insulation if specific conditions are met and located in entirely in inside the building's thermal envelope. §150.0(m)1B
- Filter racks or grilles shall be gasketed or sealed to prevent air from bypassing the filter. §150.0(m)12Bv
- Gas water heater installations must provide a designated space for a future HPWH installation. §150.0(n)
- New requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. §150.0(o)1B
- Vented kitchen range hoods require ventilation rates or capture efficiencies based on conditioned floor area and fuel type (see Tables 150.0-E, F, & G). §150.0(o)1G
- Installed HRV and ERV systems must have a HERS-verified maximum fan efficacy of 1.0 W/cfm. §150.0(o)2C
- New energy storage system (ESS) ready requirements, including interconnection equipment or a dedicated raceway, a minimum of four branch circuits, a minimum busbar rating of 225 amps, and space for future installation of a system isolation equipment or transfer switch. §150.0(s)
- New electric ready requirements for space heating, cooking, and clothes dryers, when gas equipment is installed. Electrical infrastructure must be provided and reserved to the equipment location for the future installation of electrical appliances. §150.0(t)-(v)

Prescriptive Compliance:

- Space heating equipment must be a heat pump in climate zones 3, 4, 13, and 14. In other climate zones it can be either a heat pump or a gas heating system. §150.1(c)6
- Water heating equipment must be a HPWH meeting certain criteria or solar water heating system with electric backup. §150.1(c)8
- In climate zones 3, 4, 13, and 14, a gas instantaneous water heater (max input 200,000 Btu/h, no storage tank) is allowed if the space conditioning system is a heat pump. §150.1(c)8
- New dwelling units with a conditioned floor area 500 sf or less may install an instantaneous electric water heater with point of use distribution. §150.1(c)8
- New dwelling units with a conditioned floor area 500 sf or less do not require a whole-house fan. §150.1(c)12
- Revises and updates PV language for clarity, including solar access roof area (SARA). §150.1(c)14
- No PV system required when size is less than 1.8 kWdc. §150.1(c)14

Performance Compliance:

- New energy design rating (EDR) metrics - EDR1, based on source energy; EDR2 now includes efficiency EDR and solar generation/flexibility EDR. Compliance requires separately meeting EDR1, efficiency EDR, and total EDR2. §150.1(b)1



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Additions and Alterations:

- For additions, duct leakage testing applicable when extending any length of existing ducting. §150.2(a)
- New or replacement space heating systems serving an addition may be a heat pump or gas heating system. §150.2(a)
- In climate zones 1, 2, 4, and 8-16, additions less than 700 sf, roof and ceiling insulation in a vented attic must meet a maximum overall assembly U-factor of 0.025. If wood-framed, may install insulation of R-38 or greater. §150.2(a)1Bi
- In climate zones 3 and 5-7, additions less than 700 sf, roof and ceiling insulation in a vented attic must meet a maximum overall assembly U-factor of 0.031. If wood-framed, may install insulation of R-30 or greater. §150.2(a)1Bi
- Junior Accessory Dwelling Units (JADU) that are additions to an existing building are exempt from the whole-dwelling unit mechanical ventilation airflow requirements. §150.2(a)1C2
- Water heater options for additions updated for more specificity across all types. §150.2(a)1D
- For HVAC duct alterations, duct leakage testing now triggered when 25 or more ducting is replaced or installed. §150.2(b)1D
- HPWHs are allowed for alterations in all climate zones. §150.2(b)1Hiii
- Consumer electric water heaters may replace an existing electric resistance water heater. §150.2(b)1Hiii
- Cool roof requirements expanded to additional climate zones for alterations. §150.2(b)1I
- New roof and vented attic ceiling insulation requirements for alterations. §150.2(b)1Iib & §150.2(b)1J
- IAQ and mechanical exhaust requirements amended and revised to clarify applicability for alterations. §150.2(b)1L&M
- Alterations that add door area must meet prescriptive U-factor requirements. §150.2(b)2N



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What's New for Multifamily

- All HVAC requirements unified. For dwelling units: heat pump baselines for space heating in most climate zones; refrigerant charge and CFI fan efficacy testing applies to all multifamily buildings but installing contractor conducts testing for buildings with 4 or more habitable stories; ERV/HRV required when balanced ventilation is used to meet ventilation requirements in certain climate zones. §170.2(c)3
- For common use areas: major revisions to fan power requirements, including 1kW fan electrical input power trigger and multiple new allowances for system type, air flow, filtration, etc.; and new requirements added for dedicated outdoor air systems (DOAS) and exhaust air heat recovery. §170.2(c)4
- Water heater requirements unified. Water heaters serving single dwelling units must be a HPWH with certain plumbing conditions for climate zones 1 and/or 16, or gas instantaneous water heater up to 200,000 Btu/h; new plumbing and configuration requirements for central HPWHs; in Climate Zones 1-9, gas/propane central water heater systems must meet minimum equipment thermal efficiency, recirculation, and solar water heating meeting certain solar savings fraction. §170.2(d)
- Indoor common area lighting and outdoor lighting requirements unified. Updates to indoor luminaire power densities (LPDs) and outdoor hardscape and additional lighting power allowances. §170.2(e)
- New photovoltaic and battery storage requirements added for specific building types over 3 habitable stories. §170.2(g)&(h)

Performance Compliance:

- All multifamily buildings use same compliance software for nonresidential buildings to demonstrate compliance.
- Approved community shared solar or battery storage programs may offset required PV or battery storage system TDV energy. §170.1

Additions and Alterations:

- All envelope, IAQ, and water heater requirements, including exceptions, for additions unified. §180.1(a)
- Water heaters installed to serve dwelling units as part of an addition must meet new construction prescriptive requirements. §180.1(a)3
- All envelope, HVAC, water heating, lighting, EPD, IAQ requirements for alterations unified. §180.2(b)
- New insulation, sealing, recessed luminaires, requirements added for altered vented attics. §180.2(b)1Bi
- Altered fenestration efficiency requirements dependent on type, climate zone, and number of habitable stories. §180.2(b)1C
- When applicable, duct leakage, airflow and fan watt draw, refrigerant charge testing, etc. conducted by installing contractor for buildings with more than 3 habitable stories. §180.2(b)2A
- For common use areas, new fan power requirements added for HVAC alterations. §180.2(b)2Bi
- Altered water heaters serving single dwelling units must be a gas/propane water heater or HPWH meeting certain criteria. §180.2(b)3C
- IAQ and mechanical exhaust requirements amended and revised to clarify applicability for alterations. Airflow, CFM and some rating verification and testing conducted by installing contractor for buildings with more than 3 habitable stories. §180.2(b)5



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What's New for Multifamily

Multifamily What's New for 2022 Summary

The 2022 Energy Code reorganizes low-rise (three or fewer habitable stories) and high-rise (four or more habitable stories) multifamily buildings into one building type, updates the multifamily buildings definition, and moves all requirements for multifamily buildings to their own subchapters under Sections 160.0-180.4.

Administrative Regulations:

- Lighting and Mechanical ATTCPs must record related Certificates of Compliance, Installation, and Acceptance Testing in an electronic database. §10-103.1(c)3H & §10-103.2(c)3H
- Outdoor lighting zones (LZ) updated and rural areas moved to LZ1 and urban clusters added to LZ2. Building types added to state defaults, and notification requirements for LZ amendments were removed. §10-114
- Energy Commission-approved community shared solar or renewable system and energy storage system qualification requirements updated. §10-115

Mandatory Requirements:

- Minimum HVAC efficiency requirements updated for various equipment types, and minimum efficiency requirements added for DOAS, ACs serving computer rooms, and heat pump and heat recovery chiller packages. §110.2
- Demand responsive lighting controls trigger changed to 4,000 watts or more, and requirements added for controlled receptacles. §110.12 & §160.5(b)4E
- All envelope insulation, vapor retarder, and fenestration requirements unified. §160.1
- For dwelling units, new requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. §160.2(b)2Aii
- For dwelling units, vented kitchen range hoods require ventilation rates or capture efficiencies based on conditioned floor area and fuel type (see Tables 160.2-E, F, & G). §160.2(b)2Avic2
- For dwelling units, installed HRV and ERV systems must have a HERS-verified maximum fan efficacy of 1.0 W/cfm. §160.2(b)2Biii
- For common areas, filter racks or grilles shall be gasketed or sealed to prevent air from bypassing the filter. §160.2(c)1D
- Mechanical ventilation systems of enclosed parking garages must meet the requirements of §120.6(c). §160.2(d)
- For dwelling units, duct leakage and HVAC airflow and fan watt draw testing is conducted by installing contractor in buildings with 4 or more habitable stories. Exceptions are provided for certain climate zones. §160.3(b)5K & §160.3(b)5L
- For common areas, formerly prescriptive duct leakage testing is now mandatory. §160.3(c)2H
- New acceptance testing requirements added for dwelling units. §160.3(d)2
- Water heating piping must be insulated per Table 160.4-A. §160.4(f)
- Indoor and outdoor lighting requirements unified and applicability clarified for dwellings, common areas, and outdoor lighting. §160.5
- Requirements clarified for communal pool and spa systems vs private single-tenant pools and spas. §160.7(b)
- New electric ready requirements for space heating, cooking, and clothes dryers serving individual dwelling units and common areas, when gas equipment is installed. Electrical infrastructure must be provided and reserved to the equipment location for the future installation of electrical appliances. §160.9(a)-(c)

Prescriptive Compliance:

- All envelope requirements unified. Vertical fenestration and glazed doors area requirements based on conditioned floor area and gross wall area. Fenestration efficiency values dependent on type, climate zone, and number of habitable stories. §170.2(a)



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What's New for Nonresidential

Mechanical

- Minimum HVAC efficiency requirements updated for various equipment types, and minimum efficiency requirements added for DOAS, ACs serving computer rooms, and heat pump and heat recovery chiller packages. §110.2
- Mandatory air filtration requirements added for nonresidential and hotel/motel buildings. §120.1(c)
- Mandatory requirement clarifications to spaces for which occupant sensor ventilation control devices are required. §120.1(d)5
- Mandatory requirements updated to when occupant sensing zone controls are required. §120.2(e)3
- Mandatory ductwork and plenums must meet Seal Class A. §120.4(b)
- Duct leakage testing now mandatory. §120.4(g)
- Heat pump space heating now prescriptively required for certain occupancies. §140.4(a)2
- Prescriptive fan power requirements updated, including applicability to healthcare facilities. §140.4(c)
- New economizer exceptions for certain dedicated outside air system (DOAS) configurations. §140.4(e)
- Equipment efficiency and distribution system requirements for gas boiler systems used for space heating in climate zones 1-6, 9-14, and 16 with a total system input of 1-10 MMBtu/h. §140.4(k)8
- New prescriptive requirements for DOAS. §140.4(p)
- New prescriptive requirements for exhaust air heat recovery. §140.4(q)
- New prescriptive requirements for water heating for school buildings. §140.5(a)1
- Hotel/motel water-heating requirements aligned with multifamily water-heating requirements. §140.5(b)
- New prescriptive minimum efficiency for gas water-heating systems with total capacity of 1 MMBtu/h or greater. §140.5(c)
- Revisions made to fan power credits when installing new or replacement space-conditioning systems or components other than ducting. §141.0(b)2C

Electrical Power Distribution

- Demand responsive lighting controls now required for buildings with total installed lighting power of 4,000 watts or greater rather than buildings larger than 10,000 square feet. §110.12(c)
- Controlled receptacles now required to be demand responsive. §110.12(e)
- Receptacle control acceptance testing requirements added. §130.4(a)

Covered Processes

- Mandatory requirements added for transcritical carbon dioxide refrigeration systems. §120.6(a) and (b)
- Mandatory requirements added for compressed air systems. §120.6(e)
- Mandatory requirements added for controlled environment horticulture systems. §120.6(h)
- Mandatory requirements added for steam traps. §120.6(i)
- Mandatory requirements added for computer rooms, including uninterruptible power supplies (UPSs). §120.6(j)
- Prescriptive requirements added for computer rooms. §140.9(a)
- Prescriptive requirements added for laboratory and factory exhaust systems. §140.9(c)
- New requirements for new cooling systems and UPSs in computer room additions and alterations. §141.1(b)
- New requirements for additions and alterations to controlled environment horticulture spaces. §141.1(c)



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What's New for Nonresidential

Nonresidential What's New for 2022 Summary

Under the 2022 Building Energy Efficiency Standards (Energy Code), major changes to nonresidential and hotel/motel building requirements include new PV and energy storage system requirements, a prescriptive heat pump space-conditioning baseline for certain climate zones, requirements for dedicated outdoor air systems (DOAS), and the addition of new covered processes, including controlled environment horticulture spaces.

Administrative Regulations:

- Lighting and Mechanical ATTCPs must record related Certificates of Compliance, Installation, and Acceptance Testing in an electronic database. §10-103.1(c)3H & §10-103.2(c)3H
- Outdoor lighting zones (LZ) updated and rural areas moved to LZ1 and urban clusters added to LZ2. Building types added to state defaults, and notification requirements for LZ amendments were removed. §10-114
- Energy Commission-approved community shared solar or renewable system and energy storage system qualification requirements updated. §10-115

PV and Energy Storage

- New prescriptive requirements added for photovoltaic (PV) and battery storage systems for specific building types. §140.10
- Energy Commission-approved shared solar PV, other renewable electric generation system, or energy storage system may be used to meet PV or ESS requirements using the performance method. §140.1(b)

Envelope

- Prescriptive solar reflectance and thermal emittance requirements increased for climate zones 2 and 4-16.
- Prescriptive metal-framed wall U-factor maximums decreased. §140.3(a)2 and Table 140.3-B
- Vertical glazing efficiency values now climate zone dependent. §140.3(a)5 and Table 140.3-B
- Exterior doors with 25% glazing are considered glazed doors. §140.3(a)7
- Prescriptive air barrier requirements expanded to all climate zones. Language added to include specifications on construction documents, and verification requirements updated and clarified. §140.3(a)9 and Table 140.3-A
- Revised prescriptive requirements for roofing products used in alterations. §141.0(b)2B
- New threshold for applicability of air barrier requirements to alterations. §141.0(b)2Q
- Alterations that add door area must meet prescriptive U-factor requirements. §141.0(b)2R

Indoor Lighting

- Mandatory multilevel lighting control step updated. §130.1(b) and Table 130.1-A
- Mandatory occupant sensing control requirements specified for office spaces greater than 250 sf. §130.1(c)6D
- Automatic daylighting controls for secondary sidelit daylight zones now mandatory. §130.1(d)
- Prescriptive power adjustment factors updated for daylight continuous dimming plus off controls, occupant sensing controls in offices larger than 250 square feet, and demand responsive lighting controls. §140.6(a)2, Table 140.6-A
- Prescriptive lighting power density allowances updated. Tables 140.6-B, -C, -D, and -G

Outdoor Lighting

- Outdoor lighting zones (LZ) updated and rural areas moved to LZ1 and urban clusters added to LZ2. Building types added to state defaults, and notification requirements for LZ amendments were removed. §10-114
- General hardscape lighting power allowances decreased. Table 140.7-A
- Security camera specific application added for additional lighting power. Table 140.7-B
- The term "cutoff" has been replaced with the term "shielding." §130.2(b)