2022 California Energy Code (CEC) Changes

SUMMARY

New and altered homes are to become more efficient in several ways to create energy and environmental savings for Californians. Single-Family Building Types remain in Sections 150.0-150.2: Mandatory Measures 110.0-110.10 and 150.0, Prescriptive Measures 150.1(a) and (c), and optional features accounted for when doing Performance based computer modeling 150.1(a) and (b).

Multifamily Buildings, both low-rise and high rise, are now contained within Sections 160.0-180.4: Mandatory Measures 110.0-110.10 and 160.0, Prescriptive Measures 170.2(a-f), and optional features accounted for when doing Performance based computer modeling (170.1). Building systems that include updates are: Single Family and ADU's Envelope, Single Family Mechanical, Solar PV and Energy Storage Systems (ESS).

Hotel/Motel & Nonresidential Buildings are located in Sections 120.0-141.1: Mandatory Measures 110.0-110.12 & 120.0-130.5. Prescriptive Measures 140.2-140.9, and optional features accounted for when doing Performance based computer modeling (140.1). Additions and Alterations are located in Sections 141.0-141.1. Significate changes to Nonresidential and hotel/motel building requirements include PV and ESS (Energy Storage Systems), prescriptive heat pump space-conditioning baseline for certain climate zones, requirements for dedicated outdoor air system (DOAS), and the addition of new covered processes, including controlled environment horticulture spaces. A definition for "Multifamily Building" was added, and multifamily buildings now have their own sections, beginning at Section 160.0.

SIGNIFICANT CHANGES

NEW	CHANGE	CEC SECTION/TABLE NUMBER	**COMMENTARY (RESIDENTIAL)**	MASTER PLAN IMPACT YES	MASTER PLAN IMPACT NO
☒	☐	150.0(a)	**Mandatory Features and Devices (Envelope).** Roof deck, ceiling and rafter roof insulation maximum U-factor required. Exceptions available.	☒	☐
☐	☒	150.0(k)1.A.	**Mandatory Features and Devices (Lighting).** Luminaire efficacy Exceptions provided.	☒	☐
☐	☒	150.0(k)1.B.	**Mandatory Features and Devices (Lighting).** Screw based luminaires shall contain lamps that comply with Ref. Joint Appendix JA8.	☒	☐
☒	☐	150.0(k)1.C.	**Mandatory Features and Devices (Lighting) Recessed downlight luminaires in ceilings**. Requirements for luminaires in Fire-Rated Assemblies. Includes reference to CA Electrical Code Sec. 410.116.	☒	☐
☐	☒	150.0(k)1.E.	**Blank electrical boxes**. Blank boxes more than 5 feet above floor with no luminaire or device shall be no greater than number of bedrooms, must be served by a dimmer, vacancy sensor, low voltage wiring or fan speed control.	☒	☐
☐	☒	150.0(k) 2.D.	**Indoor lighting controls.** Further clarification of requirements, plus Energy Management Control Systems (EMCS) included, with specific required Code Section applications.	☒	☐

SIGNIFICANT CHANGES (cont'd)

☐	☒	150.0(k)2.E.	**Automatic–off controls.** Bathrooms, garages, laundry and utility rooms, and walk-in closets, at least one installed luminaire shall be controlled by an occupancy or vacancy sensor providing automatic –off functionality. For lighting internal to cabinetry with opaque fronts or doors, controls that turn the light off when the drawer or door is closed shall be provided.	☒	☐
☒	☐	150.0(k) 2.F.	**Dimming Controls**. Lighting in habitable spaces shall include readily accessible wall-mounted dimming controls that allow manual up and down adjustment. A few exceptions are available.	☒	☐
☒	☐	150.0m.B,and i.a. & i.b.	**Air-distribution and ventilation system ducts, plenums and fans.** Minimum R-6 required OR 'ALL' conditions of exceptions of a. & b. are must be met.	☒	☐
☐	☒	150.0(n).	**Water Heating Systems.** System using gas or propane water heaters to serve individual dwelling units shall designate minimum 2.5 x 2.5 x 7 feet tall space for future heat pump water heater (HPWH) by meeting one of two options specified.	☒	☐
☒	☒	150.0(o).	**Requirements for ventilation and indoor air quality. Central fan integrated ventilation systems (CFI).** This sections specifies how dwelling unit ventilation airflow is accomplished per 150.0(o) 1C.	☒	☐
☒	☐	150.0(o) 1.C.-K.	**Whole-dwelling unit mechanical ventilation for single-family detached and townhouses.** These sections address mechanical ventilation airflow, air filtration, Local Mechanical Exhaust, Airflow measurement of whole-dwelling unit ventilation, Sound ratings for whole-dwelling unit ventilation systems, Labeling requirements, and Combustion air and compensation outdoor air for makeup air.	☒	☐
☐	☒	150.0(o) 2. A.-C.	**Field verification and diagnostic testing.** Three (3) sections address required field testing applicable to A. Whole-dwelling unit ventilation airflow performance, B. Kitchen local mechanical exhaust-vented range hoods, and C. (HRV) Heat recovery ventilation and energy recovery ventilation (ERV) system fan efficacy.	☒	☐
☐	☒	150.0(s)	**Energy Storage Systems (ESS) Ready.** All single family residences that include one or two dwelling units shall meet requirements for ESS (or) raceway from service to subpanel that supplies the branch circuits per 150.0(s)(2). (And) 4 branch circuits; one circuit to serve refrigerator, one lighting circuit near primary egress and one circuit to supply a sleeping room receptacle outlet. (And) minimum 225 Amp busbar at main panelboard, (and) within 3 feet of the main panelboard, space shall be reserved for future isolation equipment/transfer switch, and raceway shall be provided between panelboard and transfer switch to allow connection of backup power source.	☒	☐
☒	☐	150.0(t)	**Heat pump space heater ready.** Systems using gas or propane furnace to serve individual dwelling units shall	☒	☐

SIGNIFICANT CHANGES (cont'd)

			include; 1. Dedicated 240 volt branch circuit wiring within 3 feet of furnace. Rated 30 Amp conductors minimum. Blank cover identified as '240V Ready'. And 2. Main electrical service panel provides reserved space to allow future installation of double pole circuit breaker for future heat pump space heater installation. Breaker space marked 'For Future 240V use'.		
☒	☐	150.0(u)	**Electric cooktop ready.** Systems using gas or propane cooktop to serve individual dwelling units shall include **1**. 240V branch circuit wiring within 3 feet of cooktop, rated 50 amp conductors minimum. Blank cover identified '240V ready'. **2.** Main electrical service panel provides reserved space to allow future installation of double pole circuit breaker for future heat pump space heater installation. Breaker space marked 'For Future 240V use'.	☒	☐
☒	☐	150.0(v)	**Electric clothes dryer ready**. Clothes dryer locations with gas or propane pluming to serve individual dwelling units shall include; 1. Dedicated 240 volt branch circuit wiring within 3 feet of furnace. Rated 30 Amp conductors minimum. Blank cover identified as '240V Ready'. And 2. Main electrical service panel provides reserved space to allow future installation of double pole circuit breaker for future heat pump space heater installation. Breaker space marked 'For Future 240V use'.	☒	☐
☒	☐	150.2(b)	**Duct Systems:** Alterations to duct systems leakage must now test at 10 percent (formerly 15 percent).	☐	☒
☒	☐	150.2(b)1D	**Entirely New or Complete Replacement Duct Systems (75% or more)** Shall also conform to MERV-13 filter requirements. If AC, must meet air flow and fan watt draw requirements of New Construction. If air handler and ducts are in a vented attic, triggers ceiling insulation, air sealing and recessed can light requirements per 150.2(b)1J applicable.	☐	☒
☒	☐	150.2(b)1.I.i. & ii.	i.) **Steep Slope Roofs** remain with the existing Aged Solar Reflectance, thermal emittance, and SRI values; however, the exceptions have been slightly revised. ii.a.) **Low Slope Roofs** in Zone 11 and 12: existing Aged Solar Reflectance equal to or greater than 0.63 and a thermal emittance equal to or greater than 0.75, OR a minimum SRI of 75. Exceptions are provided for the aged solar reflectance. ii.b.) Roofs shall be insulated to the levels specified in Table 150.2-C. Zone 11 and 12 = Continuous R-14 or Roof Assembly = 0.039. Exceptions are available.	☐	☒

SIGNIFICANT CHANGES (cont'd)

☒ ☐	150.2(b)1D & 150.2(b)1.J.	Entirely new or complete replacement duct systems shall also conform to the requirements of Sections 150(m)12 and 150(m)13. If the air handler and ducts are located within a vented attic, the requirements of Section 150.2(b)1J shall also be met. J. (Ceiling.)	☐ ☒
NEW - CHANGE	CEC SECTION/TABLE NUMBER	**COMMENTARY (MULTI-FAMILY)**	MASTER PLAN IMPACT YES - NO
☒ ☐	Prescriptive 170.2(f), (g), (h) Performance 170.1	**Low and High rise Multi-family,** in this section including both Common use & Dwelling Units. Note: Energy Compliance forms based on number of stories. 3 stories or less vs. 4 stories or more. **Prescriptively,** PV required for all newly constructed low-rise residential, with output no less than the smaller of a PV system size determined using equation 170.2-C, or the maximum PV system size that can be installed on the building's solar access roof area (SARA). Exceptions available. **Prescriptively,** Battery Storage Systems required for newly constructed high-rise multi-family. **Mandatory:** Low & High-rise residential; When PV NOT installed, Solar Readiness shall be provided per 110.10 and 160.8.	☐ ☒
☒ ☐	10-103.1 (c) 3H, 10-103.2(c) 3H	Acceptance Test Technician Certification Providers (ATTCPs) must record related Certification of Compliance, Installation and Acceptance Testing in electronic database for Lighting controls and mechanical systems.	☐ ☒
☒ ☒	10-114	Outdoor Lighting Zones updated: rural areas moved to LZ1, urban clusters moved to LZ2.	☐ ☒
☒ ☐	110.2	Mandatory: Minimum HVAC efficiency requirements updated for various equipment types, and minimum efficiency requirements added for Dedicated Outside Air System (DOAS), ACs serving computer rooms, and heat pump and heat recovery chiller packages.	☐ ☒
☒ ☐	160.(b)2Aii	**Mandatory:** For dwelling units, new requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation.	☐ ☒
☒ ☐	Tables 160.2-E,F & G. 160.2(b)2Avic2	**Mandatory:** For dwelling units, vented kitchen range hoods require ventilation rates or capture efficiencies based on conditioned floor area and fuel type.	☐ ☒
☒ ☐	160.2(b)2Biii	**Mandatory:** For dwelling units, installed Heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems must have a Home Energy Rating System (HERS) verified maximum fan efficacy of 1.0 W/cfm.	☐ ☒

SIGNIFICANT CHANGES (cont'd)

☒	☐	160.3 (c)2H	**Mandatory:** For common areas, formerly prescriptive duct leakage testing is now mandatory.	☐	☒
☒	☐	160.3(d)2	Mandatory: New acceptance testing requirements added for dwelling units.	☐	☒
☒	☐	160.9(a)-(c)	Mandatory: 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.	☐	☒
☐	☒	110.10	Solar Readiness required when PV not installed.	☐	☒
☐	☒	170.2(a)	**Prescriptive:** 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 (c)3	**Prescriptive:** For dwelling units: heat pump baselines for space heating in most climate zones; refrigerant charge; and Central Fan Integrated (CFI) fan efficacy testing applies to all multifamily buildings but installing contractor conducts testing for buildings with four or more habitable stories; ERV/HRV required when balanced ventilation is used to meet ventilation requirements in certain climate zones.	☐	☒
☒	☐	170.2(c)4	**Prescriptive:** For common use areas: major revisions to fan power requirements, including one kW fan electrical input power trigger and multiple new allowances for system type, air flow, filtration, etc.; and new requirements added for DOAS and exhaust air heat recovery.	☐	☒
☒	☐	170.2(d)	**Prescriptive:** Water heater requirements unified. Water heaters serving single dwelling units must be a Heat pump Water Heater (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(e)	**Prescriptive:** 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(g)&(h)	**Prescriptive:** New photovoltaic (PV) and battery storage requirements added for specific building types, including buildings over three habitable stories.	☐	☒
☒	☐	180.2(b)1Bi	**Additions/Alterations:** New insulation, sealing, recessed luminaires, etc. requirements added for altered vented attics.	☐	☒

SIGNIFICANT CHANGES (cont'd)

☒ ☐	180.2(b)1C	**Additions/Alterations:** Altered fenestration efficiency requirements dependent on type, climate zone, and number of habitable stories.	☐ ☒
☐ ☒	180.2(b)3C	**Addition/Alteration:** Altered water heaters serving single dwelling units must be a gas/propane water heater or HPWH meeting certain criteria.	☐ ☒
NEW - CHANGE	CEC SECTION/TABLE NUMBER	**COMMENTARY (Non-Residential)**	MASTER PLAN IMPACT YES - NO
☒ ☐	10-103.1(c)3H 10-103.2(c)3H	**Admin. Regulations:** Lighting controls and mechanical systems acceptance test technician certification providers must record related Certificates of Compliance, Installation, and Acceptance Testing in an electronic database.	☐ ☒
☐ ☒	10-114	**Admin. Regulations:** Outdoor Lighting Zones have been modified. Rural areas moved to LZ1 & urban clusters added to LZ2. Building types added to state defaults, and notification requirements for LZ amendments were removed.	☐ ☒
☐ ☒	10-115	**Admin. Regulations:** Energy Commission-approved community shared solar or renewable system and energy storage system qualification requirements updates.	☐ ☒
☒ ☒			☐ ☒
☒ ☐	140.10	**Prescriptive:** PV & battery storage systems for specific building types.	☐ ☒
☒ ☐	Prescriptive 140.10(a) & 140.10(b) Performance 140.0, 140.1	**Non-Residential & Hotel / Motel:** **Prescriptive:** Solar PV and Battery Storage Systems required for newly constructed Hotel/Motel and newly constructed Non-Residential. **Prescriptively,** PV required for all newly constructed non-residential buildings, with output no less than the smaller of a PV system size determined using equation 140.10(a), or the total available solar access roof area (SARA) multiplied by 14 watts per square foot. Exceptions available. **Prescriptively,** All buildings required by Section 140.10(a) to have a PV system shall also have a battery storage system per 140.10 (b). **Mandatory:** Hotel/Motel & Nonresidential; When PV NOT installed, Solar Readiness shall be provided per 110.10.	☐ ☒
☐ ☒	140.3(a)1Aib2	**Envelope:** For steep-sloped roofs in climate zones 2 and 4–16, minimum aged solar reflectance, thermal emittance, and SRI increased to 0.25, 0.80, and 23, respectively.	☐ ☒
☐ ☒	140.3(a)2 & Table 140.3B	**Envelope: P**rescriptive metal-framed wall U-factor maximums decreased in all climate zones.	☐ ☒
☐ ☒	140.3(a)5 &Table 140.3-B	**Envelope:** Vertical glazing efficiency values are more stringent and now climate zone dependent for fixed windows, curtain walls, and storefronts.	☐ ☒

SIGNIFICANT CHANGES (cont'd)

☐	☒	140.3(a)1A & Table 141.0-B 141.0(b)2Bi	**Envelope.** Altered roofs must meet requirements from 140.3(a) for minimum aged solar reflectance and thermal emittance, or SRI. The U-factors in Table 141.0-B were decreased. §141.0(b) 2Bi.	☐	☒
☒	☐	130.1(c)6D	New mandatory occupant sensing control requirements for office spaces greater than 250 SF. (Indoor Lighting)	☐	☒
☐	☒	130.1(d) & 140.6(a)2 Table 140.6-A	Automatic daylighting controls for secondary sidelit daylit zones now mandatory, and Power adjustment factor for continuous dimming plus off control expanded to include luminaires in secondary sidelit daylit zone. (Indoor Lighting)	☐	☒
☐	☒	Table 140.7-A	General hardscape lighting power allowances decreased, and asphalt/concrete distinction removed. (Outdoor lighting)	☐	☒
☐	☒	110.2	Minimum heating, ventilation, and air conditioning efficiency requirements updated for various equipment types. Minimum efficiency requirements added for dedicated outside air systems (DOAS), air conditioners serving computer rooms, and heat pump and heat recovery chiller packages.	☐	☒
☐	☒	120.1(d)5	Mandatory requirement clarifications to spaces for which occupant sensor ventilation control devices are required.	☐	☒
☐	☒	120.4(g)	Duct leakage testing now Mandatory, when not a healthcare facility and, duct system serves conditioned air to occupiable space for a constant volume, single zone, space-conditioning system and, serves less than 5,000 s.f. and, combined surface of ducts located outdoors or in unconditioned space is more than 25 % of the total surface area of the entire duct system.	☐	☒
☐	☒	140.4(a)2	Single zone space conditioning systems with direct expansion cooling and a rated cooling capacity of 240,000 Btu/hr or less serving certain spaces are required to use heat pumps for space conditioning.	☐	☒
☐	☒	140.4(c) & Tables 140.4-A -140.4-D	Prescriptive fan power allowances updated and changed from nameplate horsepower to electric input power.	☐	☒
☐	☒	140.4(e)	Threshold for when an economizer is required changed from air handler total mechanical cooling capacity of 54,000 Btu/hr. to 33,000 Btu/hr. New economizer exception for specific DOAS and for controlled environment horticulture spaces.	☐	☒
☐	☒	110.12(c)	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 SF	☐	☒
☐	☒	110.12(e) & 130.4(a)8	Controlled receptacles now required to be demand responsive and verified through acceptance testing.	☐	☒
☒	☐	120.6(e)	**Covered Processes.** New mandatory requirements for compressed air systems regarding monitoring, leak testing, and pipe sizing.	☐	☒
☒	☐	120.6(j)	**Covered Processes.** New mandatory requirements for computer rooms regarding reheating, humidification, and fan control.	☐	☒

SIGNIFICANT CHANGES (cont'd)

☒	☐	140.9(a)	**Covered Processes**. New prescriptive requirements for computer rooms regarding refrigerant economizer coefficient of performance, design load thresholds, and uninterruptible power supply (UPS) efficiency.	☐	☒
☒	☐	141.1(b)	**Covered Processes**. Requirements specified for new cooling systems and UPSs in computer room additions and alterations.	☐	☒