2022 Energy Code

Multifamily Indoor Lighting Requirements

California Energy Commission

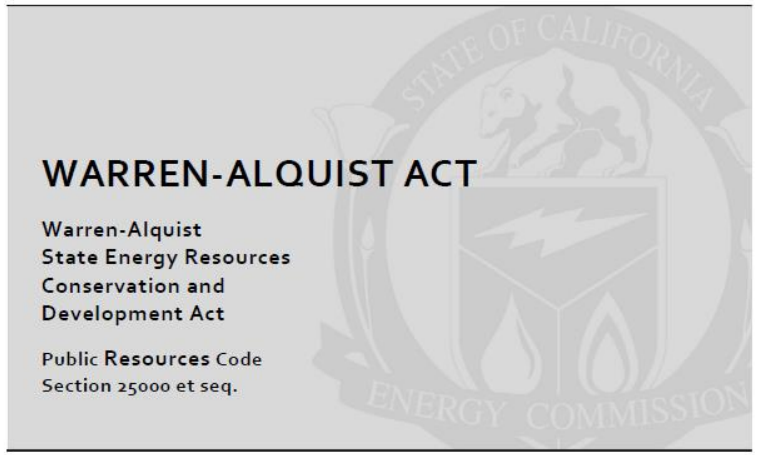
March 2024

2022 Energy Code Basics

Agenda

- 2022 Energy Code basics
- Multifamily requirements
  - Mandatory
  - Prescriptive
  - Additions and alterations
- Resources

Energy Code History

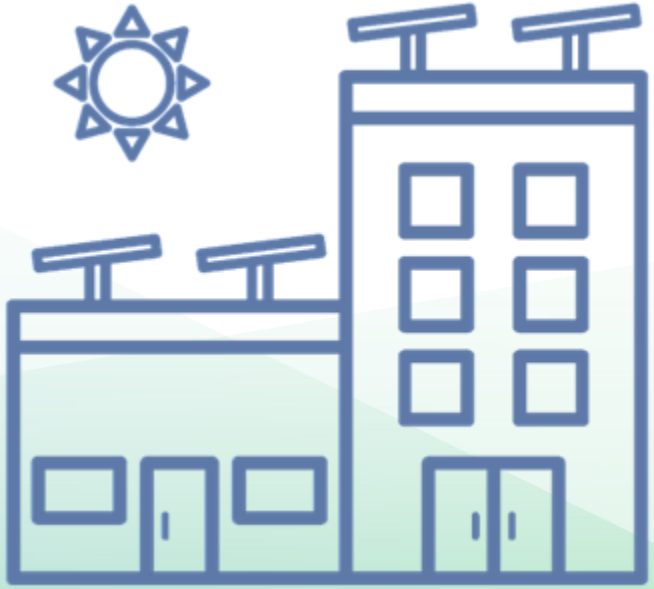


Warren-Alquist Act established CEC in 1974

- Authority to develop and maintain Building Energy Efficiency Standards (Energy Code)
- Requires CEC to update periodically, usually every 3 years
- Requires Energy Code to be cost-effective over economic life of building

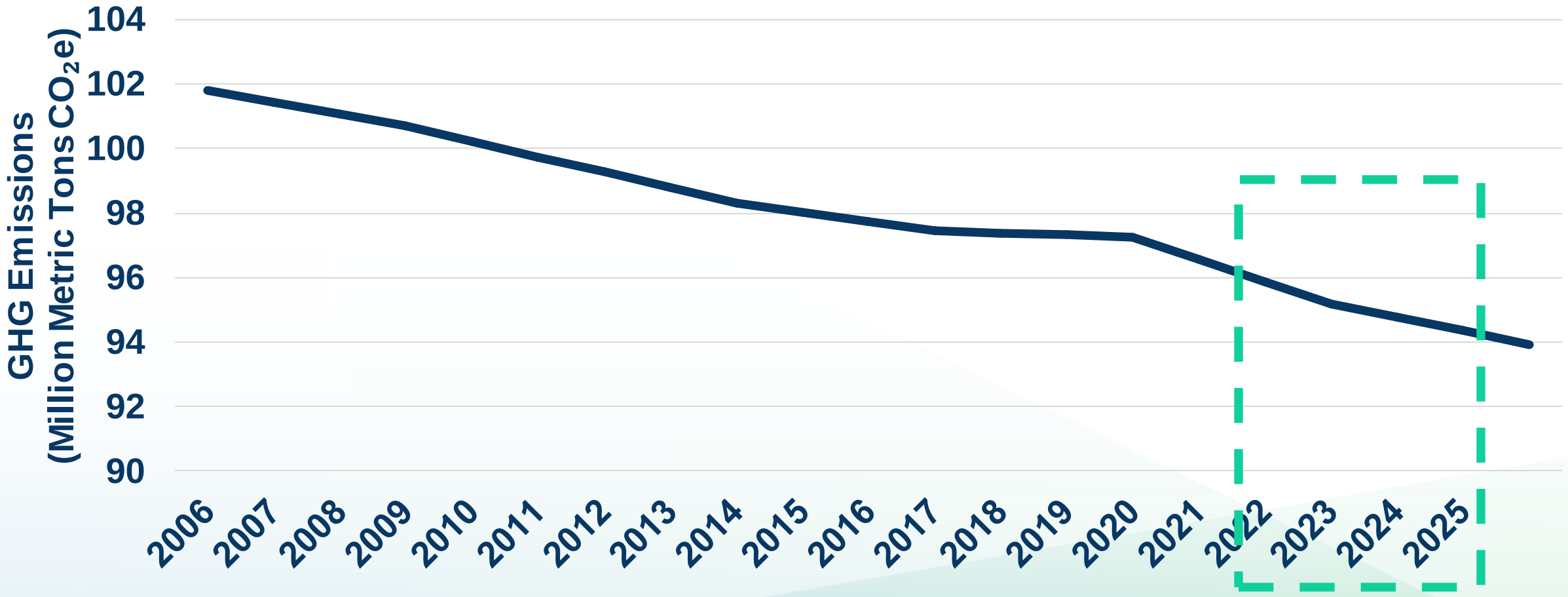
2022 Energy Code Goals

- Increase building energy efficiency cost-effectively
- Contribute to California's greenhouse gas (GHG) reduction goals
- Enable pathways for all-electric buildings
- Reduce residential building impacts on the electricity grid
- Promote demand flexibility and self-utilization of photovoltaic (PV)
- Provide tools for local government reach codes



Energy Code Environmental Benefit

Reduced Statewide Emissions

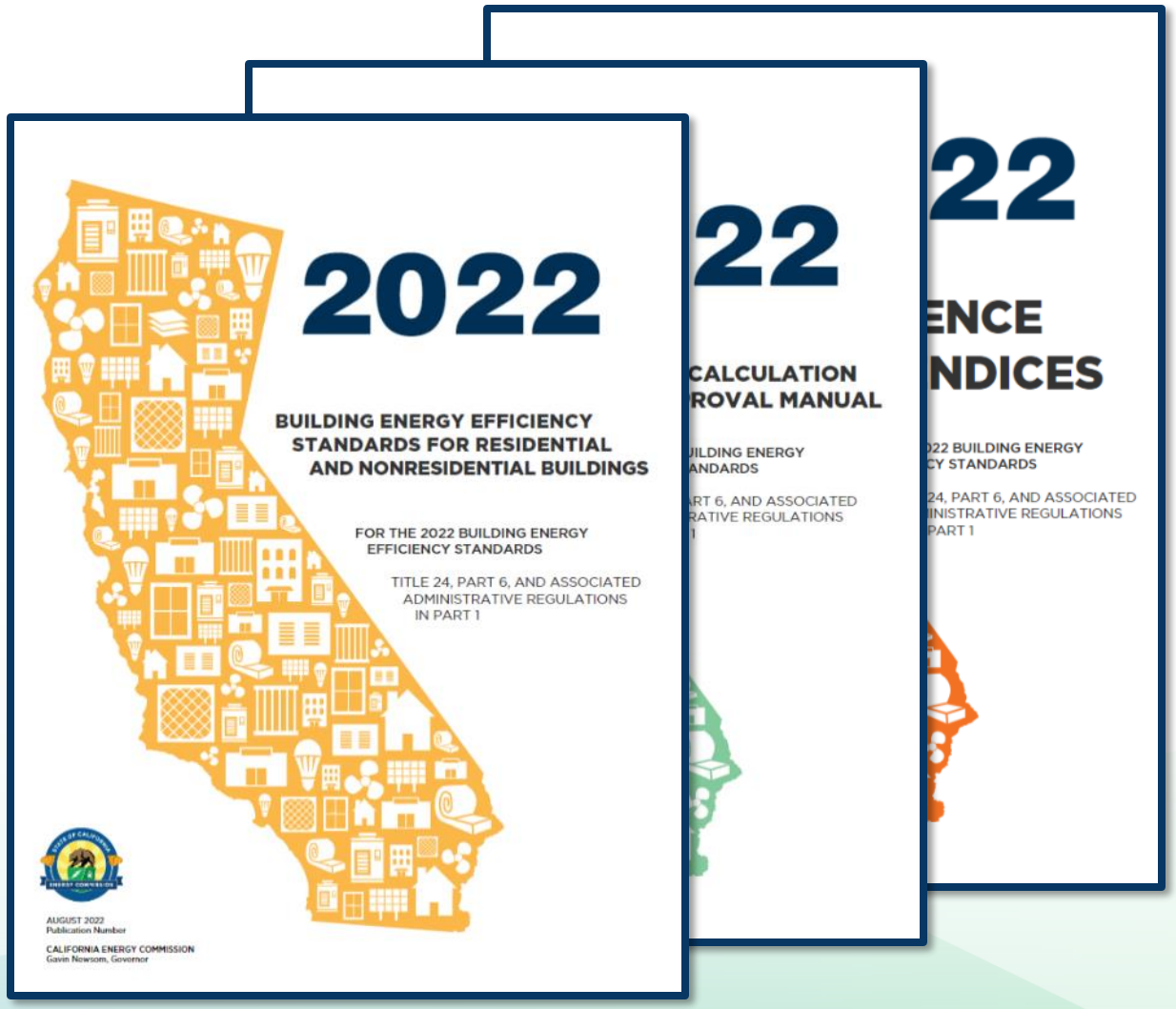


Source: CEC Impact Analysis 2005, 2008, 2013, 2016, 2019, 2022

2022 Energy Code

Effective January 1, 2023

- Building permit applications submitted on or after Jan 1, 2023
- Must use 2022 tools
  - Software
  - Forms

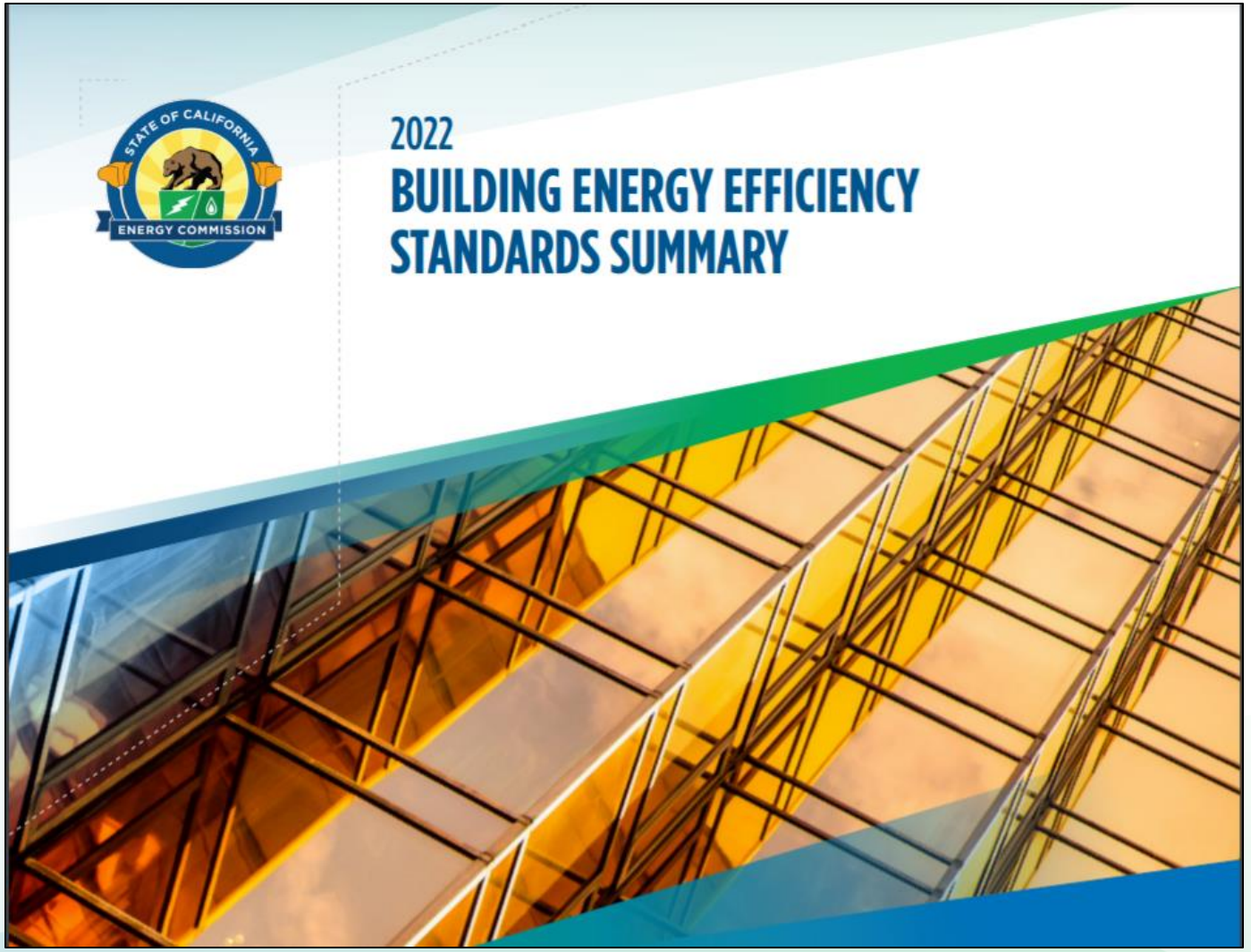


2022 Documents Online

- Energy Code
- Reference Appendices
- Compliance Manuals
- Software
- Forms

2022 Energy Code Highlights

- Heat pump baselines
- Solar and battery storage
- Ventilation requirements
- Lighting
- Multifamily restructuring



Energy Code Requirements

Mandatory requirements

- Minimum efficiency requirements must always be met
- Can never trade off

Prescriptive requirements

- Predefined efficiency requirements
- May supersede mandatory requirements
- Different requirements for newly constructed buildings, additions, and alterations

Compliance Approaches

Prescriptive approach

- Simple approach, no trade-offs
- Defines the standard building design
- 2022 heat pump baselines

Performance approach

- Most flexible approach, allows for trade-offs
- Must meet all mandatory requirements
- Requires the use of CEC-approved software
- Proposed building design meets or exceed standard building design

2022 Performance Metrics

New for 2022

Energy performance calculations

- Nonresidential and multifamily
  - Hourly source energy
  - TDV Efficiency
  - TDV Total
    - Efficiency, PV + battery

Demonstrating Compliance

- **Compliance forms confirm Energy Code is met**
- Completed by responsible party
  - Designers, consultants, builders, contractors, technicians, HERS raters, etc.
- Submitted to enforcement agencies for verification

Updated for 2022

Type of form	Single-family	Multifamily 3 or less habitable stories	Nonresidential Multifamily 4 or more habitable stories
Certificate of compliance	CF1R	LMCC	NRCC
Certificate of installation	CF2R	LMCI	NRCI
Certificate of verification	CF3R	LMCV	NRCV
Certificate of acceptance	-	-	NRCA

Forms Registration and Certification

All Buildings § 10-103

Updated for 2022

Multifamily buildings 3 or fewer habitable stories

- When HERS verification is required all LMCC, LMCI, and LMCV forms must be registered with HERS provider data registry

Multifamily buildings 4 or more habitable stories

- NRCV must be registered with HERS provider when required
- When lighting or mechanical acceptance test is required all NRCC, NRCI, and NRCA forms must be recorded with ATTCP

2022 Compliance Software

Performance approach must use approved compliance software versions

- Nonresidential and multifamily
  - CBECC 2022.3.0
  - EnergyPro 9.2
  - IES 2.0

Mandatory Requirements

§110.9 Mandatory Requirements for Lighting Controls

Requirements for:

- Time-switch controls
- Daylighting controls
- Dimmers
- Occupant sensing controls
- Indicator lights
- Track lighting integral current limiters
- Track lighting supplementary overcurrent protection panels

§160.5(a) Dwelling Unit Lighting

Applies to multifamily dwelling units, including:

- Dormitory and senior housing dwelling accommodations
- Outdoor lighting attached to multifamily buildings and controlled from inside a dwelling unit

§160.5(a)1 Indoor Dwelling Luminaire Requirements

§160.5(a)1A Luminaire Efficacy

- All luminaires or light sources must be high efficacy
- Luminaire efficacy is determined by TABLE 160.5-A; must meet one of the following:
  - Column 1: Types that are automatically high efficacy
  - Column 2: Certified to Joint Appendix 8

Luminaire Efficacy Continued

Exceptions to §160.5(a)1A:

- Lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers
- Night lights, step lights, and path lights less than 5 watts
- Lighting internal to drawers, cabinetry, and linen closets with efficacy ≥ 45 lumens per watt

Luminaire Efficacy Continued

Automatically High Efficacy	Must be JA8 Certified
LED light sources installed outdoors.	All light sources installed in ceiling recessed downlight luminaires (screw-based sockets not allowed).
Inseparable solid state lighting luminaires containing colored light sources installed for decorative lighting.	Any light source not listed in this table.
Pin-based linear fluorescent or compact fluorescent light sources using electronic ballasts.	
High intensity discharge light sources including pulse start metal halide and high pressure sodium.	
Luminaires with hard-wired high frequency generator and induction lamp.	
Ceiling fan light kits subject to federal appliance regulations.	

Joint Appendix 8 Requirements

Category	Requirement
JA8 Color Rendering Index (CRI)	≥ 90
Luminous Efficacy	≥ 45 lumens per watt
Power Factor	≥ 0.90 at full output
Start Time	Turn on within 0.5s
Correlated Color Temperature (CCT)	Inseparable SSL light engines & GU24 LED lamps: ≤ 4000K Others: ≤ 3000K

Joint Appendix 8 Requirements Continued

Category	Requirement
R9	> 50
Minimum Dimming Levels	≤ 10%
Flicker	< 30% for frequencies of 200 Hz or below
Audible Noise	< 24 dBa at 1 meter from light source
Marking	JA8-2022 or JA8-2022-E

§160.5(a)1B Screw Base Luminaires

- Shall contain lamps that comply with JA8

§160.5(a)1C Recessed Downlights

- Cannot have a screw base socket
- Must have a label certifying airtight
- Must be sealed with gasket or caulk, or be installed per manufacturer's instructions
- Must meet clearance and installation requirements of California Electrical Code 410.116

§160.5(a)1D Enclosed and Recessed Luminaires

- Lamps and separable light sources
  - Must comply with JA8 elevated temperature requirements
  - Must be marked “JA8-2022-E”

  (Note: For single-family corresponding section requirements: 150.0(k)1D-lamps and other separable light sources must be compliant with the JA8 elevated temperature and marking requirements)

§160.5(a)1E Blank Electrical Boxes

- Blank electrical boxes more than 5 feet above the floor
  - Number may be no greater than total number of bedrooms
  - Must be served by a dimmer, vacancy sensor, low voltage wiring, or fan speed control

§160.5(a)2 Indoor Dwelling Control Requirements

Lighting Control Types

Lighting Control Type	What does it do?
Dimmer	• Varies brightness by changing power delivered to the system
Occupant Sensor (indoor and outdoor)	• Auto-off when area vacated • Auto-on when area occupied
Vacancy Sensor	• Auto-off when area vacated • Manual-on
Photo Control	• Auto-on/-off based on available daylight
Astronomical Time-Switch Control (outdoor)	• Controls light based on time of day • Based on astronomical events like sunset, sunrise; accounts for geographic location & calendar date

§160.5(a)2 Indoor Lighting Controls

A. Must have readily accessible wall-mounted manual on/off controls (ceiling fans may provide control of integrated lighting via remote control)

B. May not bypass dimmer, occupancy sensor, or vacancy sensor installed to comply with §160.5(a)2

C. Comply with applicable requirements of §110.9

D. Energy Management Control Systems or multi-scene programmable controls may be used to meet control requirements

§160.5(a)2 Indoor Lighting Controls Cont.

E. Automatic Off Controls

i. Bathrooms, garages, laundry rooms, utility rooms, and walk-in closets: At least one luminaire controlled by occupancy or vacancy sensor.

ii. For lighting internal to drawers and cabinetry with opaque fronts or doors, controls that turn light off when the drawer or door is closed must be provided.

§160.5(a)2 Indoor Lighting Controls Continued.

F. Dimming Controls
   i. Lighting in habitable spaces must have readily accessible wall-mounted dimming controls.
   ii. Forward phase cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A.

Exceptions to 160.5(a)2F:

1. Ceiling fan lighting may be controlled with remote control
2. Luminaires controlled by occupancy or vacancy sensor provide automatic-off function..
3. Navigation lighting such as night, step, and path < 5 watts and lighting internal to drawers and cabinetry with opaque fronts or doors with automatic-off controls.

§160.5(a)2 Indoor Lighting Controls Continued.

G. Independent Controls
   - Lighting integrated in an exhaust fan must be controlled independently from the fans.
   - The following must be controlled separately from ceiling-installed lighting:
     v. Under-cabinet lighting.
     vi. Under-shelf lighting.
     vii. Interior lighting of display cabinets.
     viii. Switched outlets.

§160.5(a)3 Outdoor Lighting Dwelling Controls

§160.5(a)3 Outdoor Lighting Controls

- Attached to a building and controlled from inside a dwelling unit
- Must meet high efficacy requirements from §160.5(a)1
- Must have manual on/off and one of the following:
  - Photocell and either motion sensor or automatic time switch control
  - Astronomical time clock control
- Controls that override to on must return to normal operation within 6 hours.

§160.5(b) Common Services Area Lighting

§160.5(b) General Requirements

- Lighting systems and equipment in multifamily common services areas must comply with §160.5(b).
- Exception: Lighting systems in common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions may instead comply with §160.5(a).

160.5(b)1A Luminaire Classification and Power

i. Maximum rated wattage must be listed on a permanent, preprinted, factory-installed label

B. Luminaires with line voltage lamp holders not served by drivers, ballasts, or transformers: Maximum rated wattage as labeled in accordance with 160.5(b)1A

C. For luminaires with permanently installed or remotely installed ballasts: Wattage of the rated lamp-ballast combination published in ballast manufacturer's catalog based on lab testing

D. For inseparable SSL luminaires and SSL luminaires with remotely mounted drivers: Maximum rated input wattage of the luminaire when tested in accordance with UL 1598, 2108, or 8750, or IES LM-79

160.5(b)1 Luminaire Classification and Power Continued

E. LED tape lighting:

- Maximum rated input wattage of driver or power supply; or
- Installed length times rated watts/ft

F. Modular lighting systems, greater of:

- 30 watts per linear foot; or
- Rated wattage of all luminaires in the system

G. All other lighting equipment: Maximum rated wattage of the equipment, or operating input owattage of the system.

160.5(b)2 Lighting Controls

All lighting controls and equipment must comply with applicable requirements in §110.9, §160.5(b), and §160.5(c), and installed in accordance with applicable manufacturer instructions.

160.5(b)3 Energy Management Control Systems

An Energy Management Control System may be used to meet lighting control requirements if it:

- Provides all functionality for which it is installed.
- Complies with all applicable lighting control installation requirements for which it is installed.
- Complies with all application requirements for which it is installed.

§160.5(b)4 Mandatory Indoor Lighting Controls

Multifamily common use areas shall comply with:

- Applicable requirements of §160.5(b)4A – §160.5(b)4F.
- Applicable requirements of §110.9

§160.5(b)4A Manual Area Controls

A. Manual on/off controls required in each space. Must be:

i. Readily accessible.

ii. Located in same space as lights being controlled.

iii. Separate for general, floor display, wall display, window display, ornamental, and special effects lighting. Scene controllers may be used if one scene controls general lighting only, and there is a means to manually turn off all lighting.

§160.5(b)4A Manual Area Controls Cont.

Exceptions:

- Controls do not need to be readily accessible to unauthorized personnel in:
  - Public restrooms with 2 or more stalls
  - Parking areas
  - Stairwells
  - Corridors
  - Areas of a building intended for access or use by the public

§160.5(b)4A Manual Area Controls Cont.

Exceptions (Continued):

- For areas where placement of a manual area control poses a health and safety hazard, the manual area control may be located so that a person using the control can see the lights or area controlled by that control, or visual signal or display showing the current state of the controlled lighting.

§160.5(b)4A Manual Area Controls Cont.

Exceptions (Continued):

- Up to 0.1 W/ft^2 of continuous egress illumination is not required to comply with manual area control requirements if:
  - The area is designated for egress on the plans submitted to the enforcement agency
  - The egress lighting controls are not accessible to unauthorized personnel

160.5(b)4B Multi-Level Lighting Controls

For general lighting in an enclosed space ≥ 100 ft^2 with connected lighting load > 0.5 w/ft^2:

- Provide the number of control steps in Table 160.5-B
- Meet the uniformity requirements in Table 160.5-B

Exception 1: Enclosed spaces with one luminaire and no more than two lamps or only one inseparable SSL luminaire

Exception 2: Restrooms

Excerpt from Table 160.5-B

Luminaire Type	Minimum Required Control Steps (percent of full rated power[1])	Uniform level of illuminance shall be achieved by:
LED luminaires and LED light source systems	Continuous dimming 10-100 percent	Continuous dimming 10-100 percent
Line-voltage sockets except GU-24	Continuous dimming 10-100 percent	Continuous dimming 10-100 percent
Low-voltage incandescent systems	Continuous dimming 10-100 percent	Continuous dimming 10-100 percent
Fluorescent luminaires	Continuous dimming 20-100 percent	Continuous dimming 20-100 percent

160.5(b)4C Automatic Shut-OFF Controls

All installed indoor lighting shall be equipped with controls able to automatically reduce lighting power when space is unoccupied.

i. All indoor lighting must have an automatic shut-OFF control meeting the following:

a. Occupant sensing, automatic time-switch, or other control capable of automatically shutting off all lighting when the space is typically unoccupied, and

b. Separate controls for each floor, other than stairwells, and

c. Separate controls for each enclosed space not exceeding 5,000 ft^2

160.5(b)4C Automatic Shut-OFF Controls Cont.

Exceptions to §160.5(b)4Ci:

1) Areas in use 24 hours per day, 365 days per year
2) Lighting complying with §160.5(b)4Cv or 160.5(b)4Cvii
3) Up to 0.1 w/ft^2 of egress lighting, which must be designated on plans
4) Electrical equipment rooms subject to Article 110.26(D) of the California Electrical Code
5) Designated emergency lighting connected to an emergency power source or battery that functions in emergency mode only when normal power is absent

160.5(b)4C Automatic Shut-OFF Controls Cont.

ii. A countdown switch with a maximum timer setting of 10 minutes may be used for closets less than 70 ft^2

iii. An automatic time-switch control, other than an occupant sensing control, installed to comply with §160.5(b)4Ci must incorporate a manual override that:

   a. Complies with §160.5(b)4A; and

   b. Allows the lighting to remain on for no more than 2 hours when override is initiated.

iv. An automatic time-switch control, other than an occupant sensing control, installed to comply with §160.5(b)4Ci must incorporate an automatic holiday shut-off feature that turns off all loads for ≥ 24 hours, then resumes normally scheduled operation.

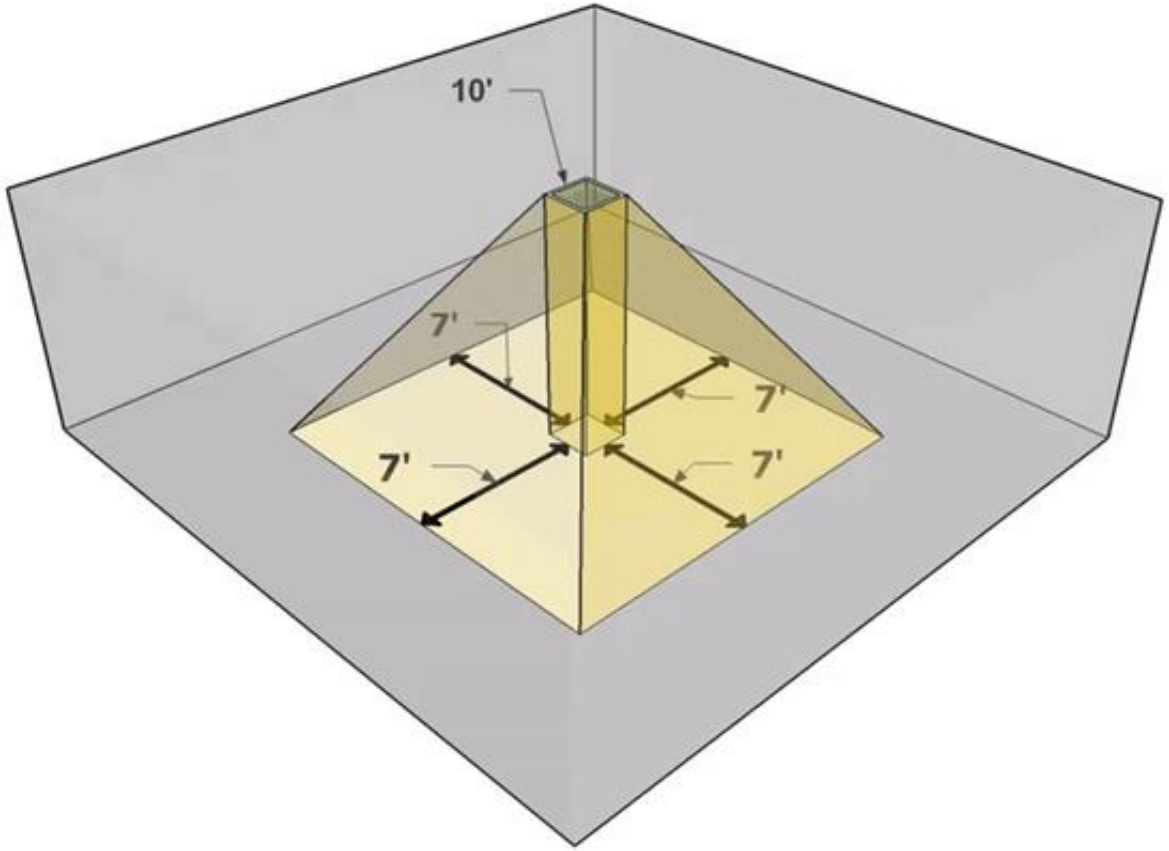
160.5(b)4C Automatic Shut-OFF Controls Cont.

v. Occupant sensing controls are required for specified offices, multipurpose rooms, conference rooms, and restrooms. (See §160.5(b)4Cv for all requirements.)

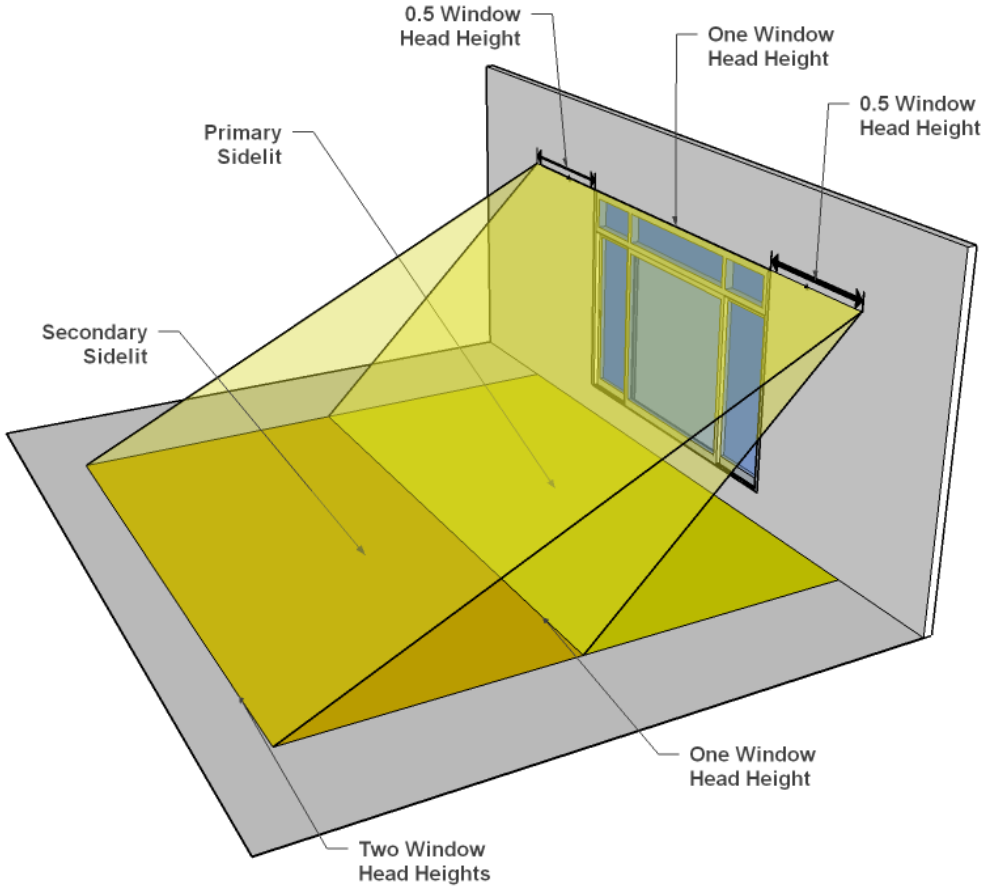
vi. Full or partial OFF occupant sensing controls are required for corridors, stairwells, and offices greater than 250 ft^2. (See §160.5(b)4Cvi for all requirements.)

vii. Partial OFF occupant sensing controls are required for parking garages, parking areas, loading areas, and unloading areas. See §160.5(b)4Cvii for requirements that apply instead of those in §160.5(b)4Ci.

160.5(b)4D Daylighting Controls



Skylit daylit zone



Sidelit daylit zones

160.5(b)4D Daylighting Controls Continued

i. Daylit zones must be shown on plans

ii. Automatically control general lighting in each type of daylit zone separately:

- General lighting in overlapping skylit daylit zone and sidelit daylit zone shall be controlled as part of the skylit daylit zone.
- General lighting in overlapping primary and secondary sidelit daylit zones shall be controlled as part of primary sidelit daylit zone.
- Linear solid state lighting may be treated as linear lamps in increments of 4 feet segments or smaller, and each segment is separately controlled based on the type of daylit zone in which the segment is primarily located.

160.5(b)4D Daylighting Controls Cont.

iii. Automatic daylighting controls shall:

a. Adjust lighting via continuous dimming or the number of control steps provided by multilevel controls

b. Illuminance from controlled lighting and daylight must not be less than that from controlled lighting when no daylight is available

c. Except for parking garages, when daylight is greater than 150% of illuminance provided by controlled lighting when no daylight is available, reduce controlled lighting power in daylight zone by ≥ 90%.

d. For parking garages, when daylight illuminance at edge of secondary daylit zone farthest from glazing or opening are greater than 150% of the illuminance provided by controlled lighting when no daylight is available, reduce controlled lighting power in combined primary and secondary sidelit daylit zones by 100%.

160.5(b)4D Daylighting Controls Cont.

iv. Photosensors shall not be readily accessible to unauthorized personnel.

v. The location where calibration adjustments are made to automatic daylighting controls shall be readily accessible to authorized personnel.

160.5(b)4D Daylighting Controls Cont.

Exceptions:

- Areas under skylights where existing adjacent structures or natural objects block direct sunlight for more than 1,500 hours/year between 8 a.m. and 4p.m.
- Rooms that have a total glazing area less than 24 square feet, or parking garages with a combined total of less than 36 square feet of glazing or opening.
- Luminaires in sidelit daylit zones in retail merchandise sales and wholesale showroom areas
- For parking garages, luminaires located in the daylight adaptation zone

160.5(b)4D Daylighting Controls Cont.

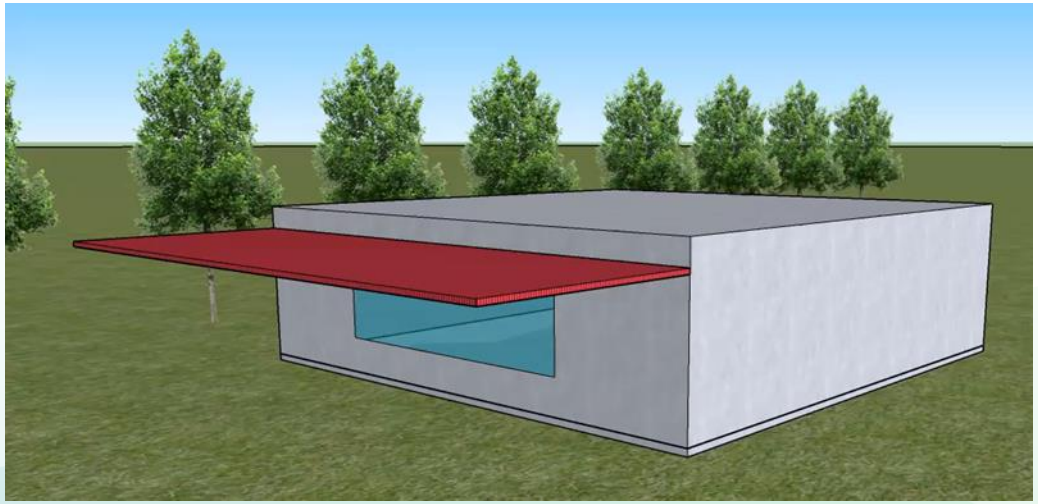
Exceptions (Continued)

- Rooms where combined total installed wattage of general lighting in skylit and primary sidelit zones is less than 120 watts are not required to have daylighting controls for those zones
- Rooms where total installed wattage of general lighting in secondary sidelit zones is less than 120 watts are not required to have daylighting controls for that zone
- Parking garages where the total installed wattage of the general lighting in the primary and secondary daylit zones is less than 60 watts do not require automatic daylighting controls in the daylit zones

160.5(b)4D Daylighting Controls Cont.

Exceptions (Continued)

- Areas adjacent to vertical glazing below an overhang where all of the following apply:
  - The overhang covers the entire width of the vertical glazing
  - No vertical glazing is above the overhang
  - The ratio of overhang projection to the overhang rise is greater than:
    - 1.5 for South, East, and West orientations, **or**
    - 1 for North orientations



160.5(b)4E & 110.12 Demand Responsive Controls

For buildings with installed lighting power ≥ 4,000 watts subject to 160.5(b):

- Certified OpenADR 2.0a or 2.0b. List available at OpenADR webpage
- Certified capable of responding to OpenADR 2.0b Virtual End Node
- Able to reduce total lighting power by ≥ 15% as described in NA 7.6.3
- When demand response controls are required, such controls must control general lighting subject to 130.1(b) and may control additional lighting
- General lighting shall be reduced consistent with uniform level of illumination requirements in TABLE 130.1-A

160.5(b)4E & 110.12 Demand Responsive Controls Continued

Exception:

- Spaces where a health or life safety statute, ordinance, or regulation does not permit the general lighting to be reduced are not required to install demand responsive controls and do not count toward the 4,000 watt threshold.

160.5(b)4F Control Interactions

i. For general lighting, the manual area control shall permit the level or amount of light provided while the lighting is on to be set or adjusted by the controls specified in Section 160.5(b)4B – E.

ii. The manual area control shall permit the shut-off control to turn the lighting down or off.

iii. The multilevel lighting control shall permit the automatic daylighting control to adjust the electric lighting level in response to changes in the amount of daylight in the daylit zone.

iv. The multilevel lighting control shall permit the demand responsive control to adjust the lighting during a demand response event and to return it to the level set by the multilevel control after the event.

160.5(b)4F Control Interactions Cont.

v. The shut-off control shall permit the manual area control to turn the lighting on. If the on request occurs while an automatic time switch control would turn the lighting off, then the on request shall be treated as an override request consistent with Section 130.1(c)3.

vi. The automatic daylighting control shall permit the multilevel lighting control to adjust the level of lighting.

vii. For lighting controlled by multilevel lighting controls and by occupant sensing controls that provide an automatic-on function, the controls shall provide a partial-on function that is capable of automatically activating between 50-70 percent of controlled lighting power.

160.5(b)4F Control Interactions Cont.

viii. For space conditioning system zones serving only spaces that are required to have occupant sensing controls as specified in Section 160.5(b)4Cv, vi, and vii, and where Table 120.1-A allows the ventilation air to be reduced to zero when the space in in occupied-standby mode, the space conditioning system shall be controlled by occupancy sensing controls as specified in Section 120.2(e)3.

160.5(e) Acceptance Testing

a) Acceptance testing per NA 7.6 required for:

   3. Automatic daylighting controls
   4. Automatic shut-OFF controls
   5. Demand responsive lighting controls
   6. Outdoor Lighting
   7. Systems receiving the institutional tuning power adjustment factor
   8. Demand responsive controlled receptacles

c) Must use certified ATTs from an approved Acceptance Test Technician Certification Provider (ATTCP)

More information available at the CEC's ATTCP webpage

Prescriptive Measures

170.2(e) Lighting

- Dwelling unit lighting requirements are all mandatory.
- Common use area lighting must meet requirements of §170.2(e) under the prescriptive approach.
- Exception: Common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions may instead comply with §160.5(a).

170.2(e)1 Interior Common Use Area Lighting

A building complies if:

A. The adjusted indoor lighting power of the proposed building is less than or equal to the allowed indoor lighting power calculated under §170.2(e)4.

B. The calculation of allowed indoor lighting power, general rules, complies with §170.2(e)3.

Source: Acuity Brands Lighting, Inc.

§170.2(e)2 Calculation of Adjusted Indoor Lighting Power

The Adjusted Indoor Lighting Power of the building is the total watts of all planned permanent and portable lighting systems in the building, subject to the adjustments in §170.2(e)2.

§170.2(e)2A Two Interlocked Lighting Systems

A maximum of two lighting systems may be used for an area if they are interlocked. The watts of the lower wattage system may be excluded from the Adjusted Indoor Lighting Power if:

i. An installation certificate is submitted; and

ii. The area(s) served by the interlocking system is an auditorium, conference room, multipurpose room, or theater; and

iii. The two lighting systems are interlocked with a nonprogrammable double-throw switch to prevent simultaneous operation of both systems

§170.2(e)2B Reduction of Wattage Through Controls

The watts of a luminaire providing general lighting in an area listed in Table 170.2-L may be reduced by the product of (i) the number of watts controlled as described in Table 170.2-L, times (ii) the applicable power adjustment factor if all of the conditions listed in §170.2(e)2B are met.

§170.2(e)2C Lighting Wattage Excluded

The watts of the lighting listed in §170.2(c)e2C may be excluded from Adjusted Indoor Lighting Power.

i. Manufacturer lighting installed in walk-in coolers or freezers, vending machines and food preparation equipment.

ii. Lighting exit signs subject to CBC shall meet the Appliance Efficiency Regulations requirements.

iii. Exit way or egress illumination normally off is subject to CBC.

iv. Temporary lighting systems.

v. Lighting systems in qualified historic buildings are exempt with historic or replicas of historic components shall comply with lighting power density allowances.

vi. Lighting for signs shall comply with Section 170.2(e)7.

vii. Lighting in elevators shall meet Section 120.6(f).

§170.2(e)2D Luminaire Classification and Power Adjustment

i. Luminaire classification and power must be determined in accordance with 160.5(b)1.

ii. For qualifying small aperture tunable-white and dim-to-warm LED luminaires, the adjusted indoor lighting power shall be calculated by multiplying their maximum rated wattage by 0.75. (See §170.2(e)2D for additional requirements.)

iii. For wall display luminaires meeting the Tailored Method, where the bottom of luminaires are ≥ 10’7” above the finished floor, the adjusted indoor lighting power shall be calculated by multiplying their maximum rated wattage and appropriate mounting height adjustment factor from Table 170.2-O.

§170.2(e)3 Calculation of Allowed Indoor Lighting Power: General Rules

A. The allowed indoor lighting power allotment for conditioned areas shall be calculated separately from that for unconditioned areas.

B. The allowed indoor lighting power allotment shall be calculated separately from that for outdoor lighting.

C. §170.2(e)3C details how to calculate the allowed indoor lighting power allotment when using the Area Category Method for all or parts of the building.

D. §170.2(e)3D details how to calculate the allowed indoor lighting power allotment when using the Tailored Method for all or parts of the building.

§170.2(e)3 Calculation of Allowed Indoor Lighting Power: General Rules Continued

E. §170.2(e)3E details how indoor lighting power allotment tradeoffs can be made between building areas. General lighting for one area with the Tailored Method may be increased up to the amount that the allowed indoor lighting power for general lighting for another area is decreased only if the Tailored Method or Area Category Method is used for the other area, except when such increases of decreases shall not be made between conditioned and unconditioned space.

F. The Area Category Method and the Tailored Method cannot both be used for the same area.

§170.2(e)4 Calculation of Allowed Indoor Lighting Power: Specific Methodologies

§170.2(e)4 details how to calculate allowed indoor lighting power allotments for primary function areas for both the Area Category Method and the Tailored Method.

Requirements for the Area Category Method:

i. Used for only for primary function areas as defined in Section 100.1 and listed in Table 170.2-M.

ii. For compliance with 17.2(e)1Ci an area shall be defined as all contiguous areas that accommodate or associated with a single primary function area.

iii. Areas bounded or separated by interior partitions the floor area may be included in a primary function area.

iv. The allowed indoor lighting power for each primary function area is the Lighting Power Density value in Table 170.2-M.

v. Add additional lighting power allowances based on Qualifying Lighting Systems.

§170.2(e)4 Calculation of Allowed Indoor Lighting Power: Specific Methodologies Cont.

§170.2(e)4 details how to calculate allowed indoor lighting power allotments for primary function areas for both the Area Category Method and the Tailored Method.

Requirements for the Tailored Category Method:

i. Used for only for primary function areas as defined in Section 100.1 and listed in Table 170.2-N.

ii. Allowed indoor lighting power allotments for general lighting based on Section 170.2(e)1Cii.

iii. For compliance with Section 170.2(e)1Cii an area shall be defined as all contiguous areas that accommodate or associate a single primary function area.

iv. Areas bounded or separated by interior partitions in the floor area may be in a primary function area.

v. Add additional lighting power allowances for wall displays, task, decorative, and special effects lighting according to Sections 170.20(e)1Ciig through j.

Additions and Alterations

§180.2(b)4A Dwelling Unit Lighting

- Altered lighting systems must meet requirements in §160.5(a).
- Altered luminaires must meet luminaire efficacy requirements in §160.5(a) and Table 160.5-A.
- Existing screw based sockets in ceiling recessed luminaires can stay; need to install new JA8-compliant trim kits or lamps designed for use with recessed downlights or luminaires.

§180.2(b)4B Common Use Areas

i. Spaces with lighting installed for the first time must meet applicable requirements in §110.9, 160.5(b)1 – 4, 160.5(c), 160.5(e), 170.2(b), and 170.2(e)1 – 170.2(e)6.

ii. When skylights are added and lighting is not recircuited, daylighting controls do not need to meet the multi-level requirements in §160.5(b)4D.

iii. New internally and externally illuminated signs shall meet requirements of Sections 110.9, 160.5(d), and 170.2(e)7.

iv. Alterations to indoor lighting that include ≥ 10% of the luminaires serving an enclosed space must meet certain requirements; see §180.2(b)4Biv for details and exceptions.

v. Alterations to existing outdoor lighting systems listed in Table 170.2-R or 170.2-S shall meet requirements of Sections 160.5(b)1, 160.5(b)2, 160.5(b)3, 160.5(c)1 and 160.5(e).

§180.2(b)4B Common Use Areas Cont.

vi. Alterations to existing internally and externally illuminated signs that increase the connected lighting load, replace and rewire more than 50 percent of the ballasts, or relocate the sign to a different location on the same or different site shall meet requirements in Section 170.2(e)7.

vii. Alterations to existing electrical power distribution systems shall meet requirements:

a. Service electrical metering.

b. Separation of electrical circuits for electrical monitoring.

c. Voltage drop.

Resources

Online Resource Center

www.energy.ca.gov/orc

Handouts

- Fact sheets
- Guides

Tools

- Checklists
- Blueprint newsletter

Training

- Presentations
- Videos

Links

- Internal resources
- External resources

New Resource Hub

Homeowners and renters

- Information about water and space heating, cooking, EV charging, incentives

Contractors

- Information about training, tools, incentives

Local government representatives

- Information about model policies, permitting, training, incentives

Links on the Building and Home Energy Resource Hub

ATTCP Program - Lighting

ATTCP Program information

Lighting Controls

- National Lighting Contractors Association of America (NLCAA)
- California Advanced Lighting Controls Training Program (CALCTP)

National Lighting Contractors Association of America

California Advanced Lighting Controls Training Program

Blueprint Newsletter

Energy Code quarterly newsletter

- Updates
- Clarifications
- Frequently asked questions

Issue 138 | April - June 2022

BLUEPRINT

CALIFORNIA ENERGY COMMISSION

EFFICIENCY DIVISION

IN THIS ISSUE

- 2022 Energy Code: Multifamily Summary
- 2022 Energy Code: Compliance Software
- 2019 Energy Code: HERS Verifications
- Q&A
  - Solar PV for Multifamily Buildings
  - Multifamily Water Heating
  - Multifamily Common Use Areas

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

2022 Energy Code: Multifamily Summary

The 2022 Building Energy Efficiency Standards (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 in § 100.1, and moves all requirements for multifamily buildings to §§ 160.0-180.4. This and other significant changes include:

Mandatory Requirements

- Updates minimum efficiencies for HVAC equipment; adds minimum efficiency requirements for dedicated outdoor air systems (DOAS), heat pump, and heat recovery chiller packages. § 110.2
- Changes demand responsive lighting controls trigger to 4,000 watts or more; adds requirements for controlled receptacles. §§ 110.12, 160.5(b)4E
- Unifies envelope insulation, vapor retarder, and fenestration requirements. § 160.1
- For dwelling units
  - Adds requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. § 160.2(b)2Aii
  - Requires vented kitchen range hoods ventilation rates or capture efficiencies based on conditioned floor area and fuel type per Tables 160.2-E, F, G. § 160.2(b)2Avic2
  - Requires a HERS-verified maximum fan efficacy of 1.0 Watts per cfm for heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems. § 160.2(b)2Biii
  - Adds mechanical acceptance testing requirements. § 160.3(d)2
  - Adds electric-ready requirements when gas equipment is installed for space heating, cooking, and clothes dryers. § 160.9(a-c)

1

Stay Connected

Receive Energy Code updates

- Subscribe to Efficiency Division emails
  - Appliances
  - Blueprint
  - Building Standards
- Respond to confirmation email

Follow the California Energy Commission

Energy Code Hotline

Monday through Friday

- 8:00 a.m. to 12:00 p.m.
- 1:00 p.m. to 4:30 p.m.

Call

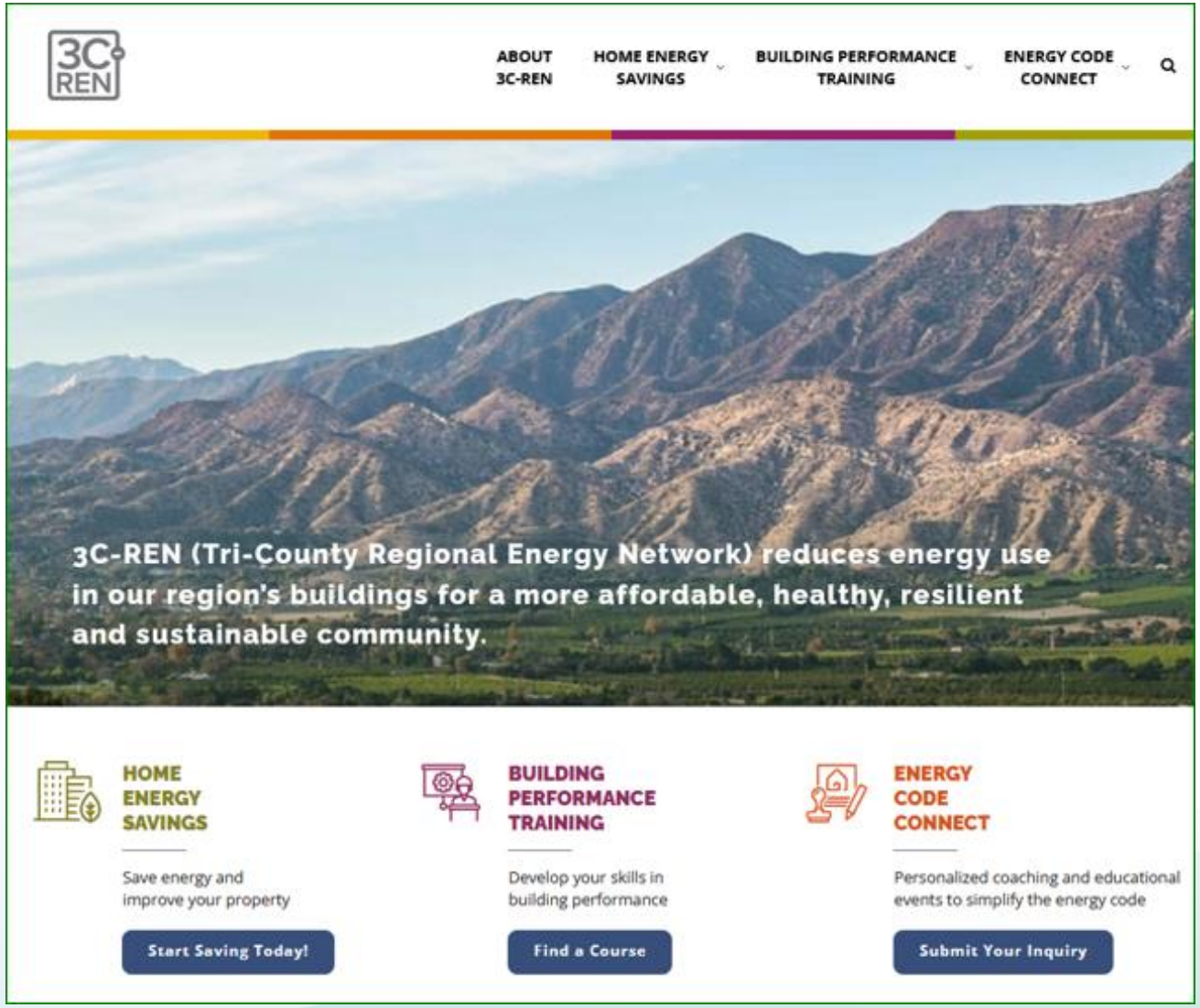
- 800-772-3300 in CA
- 916-654-5106 outside CA

Email

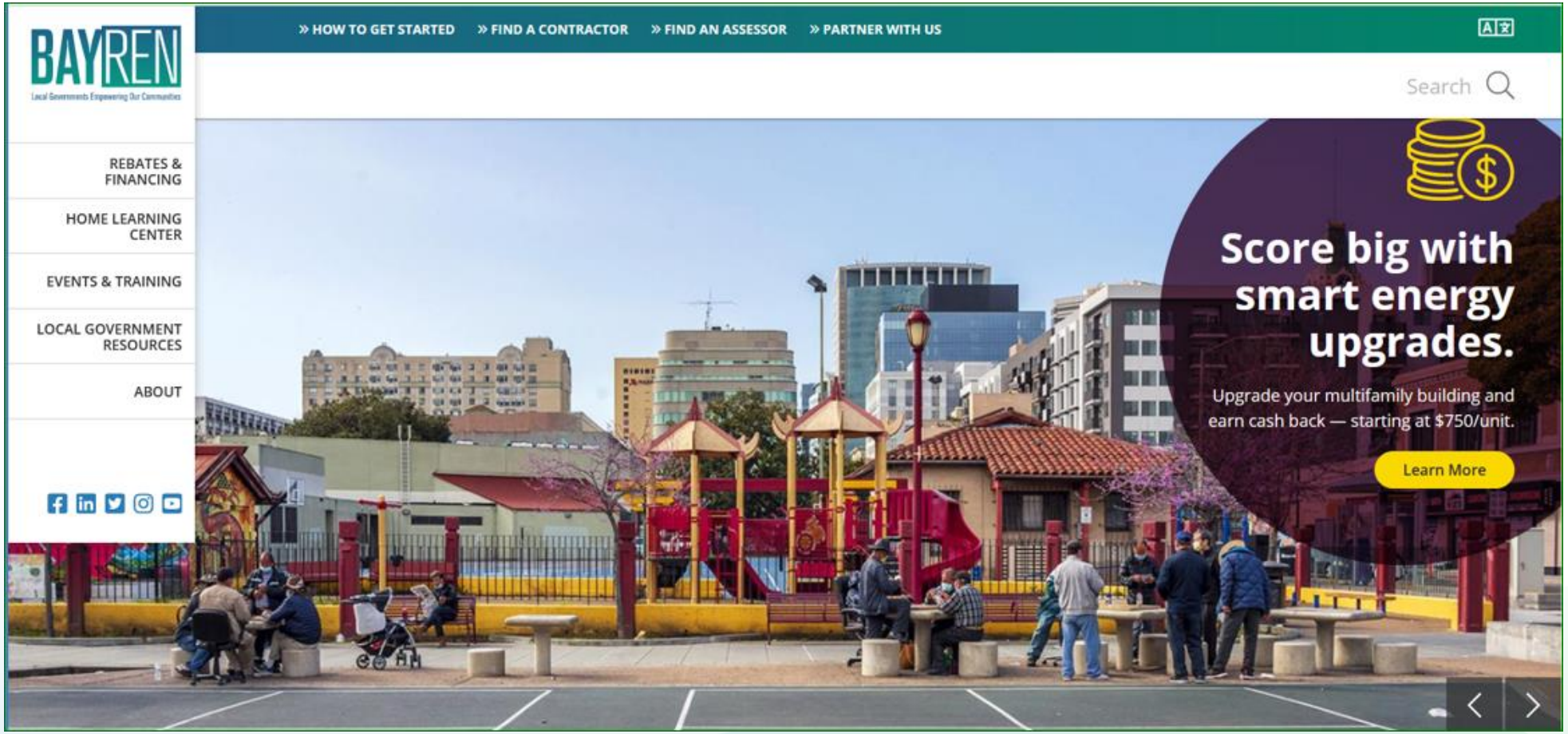
- Title24@energy.ca.gov

Energy Code Ace

3C-REN


3C REN
ABOUT 3C-REN
HOME ENERGY SAVINGS
BUILDING PERFORMANCE TRAINING
ENERGY CODE CONNECT
3C-REN (Tri-County Regional Energy Network) reduces energy use in our region's buildings for a more affordable, healthy, resilient and sustainable community.
HOME ENERGY SAVINGS
Save energy and improve your property
Start Saving Today!
BUILDING PERFORMANCE TRAINING
Develop your skills in building performance
Find a Course
ENERGY CODE CONNECT
Personalized coaching and educational events to simplify the energy code
Submit Your Inquiry

BayREN


BAYREN
Local Governments Empowering Our Communities
» HOW TO GET STARTED
» FIND A CONTRACTOR
» FIND AN ASSESSOR
» PARTNER WITH US
Search
REBATES & FINANCING
HOME LEARNING CENTER
EVENTS & TRAINING
LOCAL GOVERNMENT RESOURCES
ABOUT
Score big with smart energy upgrades.
Upgrade your multifamily building and earn cash back — starting at $750/unit.
Learn More

Inland Regional Energy Network (I-REN)

iren.gov
info@iren.gov

Codes and Standards

Training and Education Program

- Free ICC-approved training sessions for 2022 Energy Code (Title 24, Part 6) requirements → www.iren.gov/161/CS-Trainings
- Requested training courses can also be scheduled

C&S Technical Support Program

Request Free Technical Assistance from Local Code Experts—Reach Code Development, Permit Guides, Etc. → www.iren.gov/162/CS-Technical-Support

Ask a Code Mentor an Energy Code Question

Submit queries online and receive a personalized response addressed by energy code experts within two business days! → www.iren.gov/162/CS-Technical-Support

I·REN = CVAG

INLAND REGIONAL ENERGY NETWORK

Coachella Valley Association of Governments (CVAG)
San Bernardino Council of Governments (SBCOG)
Western Riverside Council of Governments (WRCOG)

* Not affiliated with, or endorsed by, the CEC

Thank you